NON-NATURALLY OCCURRING MELANOCORTIN ANALOGS AND ASSOCIATED METHODS FOR MODULATING WEIGHT GAIN

CROSS-REFERENCE TO RELATED APPLICATION(S)

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 63/607,500, filed December 7, 2023, U.S. Provisional Patent Application No. 63/618,843, filed January 8, 2024, U.S. Provisional Patent Application No. 63/557,385, filed February 23, 2024, U.S. Provisional Patent Application No. 63/573,429, filed April 2, 2024, U.S. Provisional Patent Application No. 63/650,705, filed May 22, 2024, U.S. Provisional Patent Application No. 63/656,583, filed June 5, 2025, and U.S. Provisional Patent Application No. 63/663,648, filed June 24, 2024, all of which applications are incorporated herein by reference in their entirety.

INCORPORATION BY REFERENCE OF SEQUENCE LISTING

[0002] This application contains an ST.26 compliant Sequence Listing, which is submitted concurrently in xml format and hereby incorporated by reference in its entirety. The .xml copy, created on December 9, 2024, is titled “146316_8017_WO01_SL.xml” and is 1,664 KB in size.

BACKGROUND

[0003] The ability to effectively increase weight and maintain healthy body mass in subjects suffering from various medical conditions and disorders is often challenging. These conditions, which can include muscle wasting, reduced appetite, and metabolic disorders such as cachexia, may significantly impact a subject's overall health, quality of life, and ability to respond to medical treatments. Treatment options are frequently limited by a subject's compromised physical state, affecting both the duration and dosing of therapeutic interventions. These limitations can reduce overall treatment efficacy and increase the risk that therapeutic interventions are not as effective as they could be.

[0004] Despite recent advances in therapeutic approaches for improving body mass and maintaining healthy weight levels, there remains a demand for novel approaches to

address these challenges. Such approaches should be well-tolerated, with reduced adverse effects compared to conventional methods, while providing robust therapeutic activity for weight management and maintenance.

SUMMARY

[0005] The present technology comprises non-naturally occurring melanocortin analogs and uses thereof for increasing body weight in a subject.

[0006] In some embodiments, the present technology comprises a method of increasing body weight in a subject in need thereof, including administering to the subject a non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-

amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both

present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0007] In some embodiments, the present technology comprises use of a non-naturally occurring melanocortin analog for increasing body weight in a subject in need thereof, the non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe),

para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is

Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0008] In some embodiments, the method further includes reducing lean mass loss, maintaining lean mass, or promoting lean mass gain in the subject.

[0009] In some embodiments, the lean mass is lean muscle mass.

[0010] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 0.5 mg/kg to about 10 mg/kg per body weight of the subject once daily.

[0011] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 1 mg/kg or 3 mg/kg per body weight of the subject once daily.

[0012] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 0.1 mg to about 100 mg once daily.

[0013] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg or about 50 mg once daily.

[0014] In some embodiments, the non-naturally occurring melanocortin analog is an antagonist of a melanocortin 4 receptor.

[0015] In some embodiments, the non-naturally occurring melanocortin analog is a full antagonist of the melanocortin 4 receptor.

[0016] In some embodiments, the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 4 receptor.

[0017] In some embodiments, the non-naturally occurring melanocortin analog is an antagonist of a melanocortin 3 receptor.

[0018] In some embodiments, the non-naturally occurring melanocortin analog is a full antagonist of the melanocortin 3 receptor.

[0019] In some embodiments, the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 3 receptor.

[0020] In some embodiments, the non-naturally occurring melanocortin analog is an agonist of the melanocortin 3 receptor.

[0021] In some embodiments, the non-naturally occurring melanocortin analog is a full agonist of the melanocortin 3 receptor.

[0022] In some embodiments, the non-naturally occurring melanocortin analog is a partial agonist of the melanocortin 3 receptor.

[0023] In some embodiments, the non-naturally occurring melanocortin analog has no melanocortin 3 receptor activity.

[0024] In some embodiments, the method or the use further includes preventing or reducing one or more side effects associated with a metabolic disorder, relative to a control.

[0025] In some embodiments, the present technology comprises a method of preventing or reducing cachexia in a subject in need thereof relative to a control, including administering to the subject: a non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr,

cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected

from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu. .

[0026] In some embodiments, the present technology comprises use of a non-naturally occurring melanocortin analog for preventing or reducing cachexia in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-

amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between

Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0027] In some embodiments, the present technology comprises a method of preventing or reducing anorexia in a subject in need thereof relative to a control, including administering to the subject: a non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-

amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle

or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0028] In some embodiments, the present technology comprises use of a non-naturally occurring melanocortin analog for preventing or reducing anorexia in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe),

biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0029] In some embodiments, the present technology comprises a method of increasing, maintaining, or reducing a loss in a body mass index (BMI) level in a subject in need thereof relative to a control, including administering to the subject: a non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-

chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and

R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0030] In some embodiments, the present technology comprises use of a non-naturally occurring melanocortin analog for increasing, maintaining, or reducing a loss in a BMI level in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog including a sequence of Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-

fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0031] In some embodiments, the method or the use prevents fat mass gain after administration of the non-naturally occurring melanocortin analog, relative to a control.

[0032] In some embodiments, the method or the use reduces increases a fat mass level after administration of the non-naturally occurring melanocortin analog, relative to a control.

[0033] In some embodiments, the method or the use maintains or increases brain mass in the subject during or after administration of the non-naturally occurring melanocortin analog, relative to a control.

[0034] In some embodiments, the method or the use prevents or reduces brain mass loss in the subject during or after administration of the non-naturally occurring melanocortin analog, relative to a control.

[0035] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (I): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-R9-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys); R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-

amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe; when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between

Cys at R2 and Cys at R7; when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2'); when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0036] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (I), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of

Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is selected from the group consisting of Trp, Lys, and dPen; R9 is absent or Lys; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that the non-naturally occurring melanocortin analog does not include a sequence selected from the group consisting of: Ac-Nle-c[Asp-dTrp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 83); Ac-Nle-c[Asp-Phe-Phe-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 420); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 223); Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 460); Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 464); Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 465); Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 466); Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID

NO: 467); Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 468); Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 469); Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 470); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 474); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 475); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 476); Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 477); Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 478); Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 481); Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 482); Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 483); Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 484); Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 485); Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 459); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 472); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 471); Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 463); Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 462); Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 479); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 473); Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 480); Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 486); Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 491); Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 461); Ac-Nle-c[Asp-dGln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 492); Ac-Nle-c[Asp-dTyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 496); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 218); Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 442); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 449); Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 455); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 447); Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 438); Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 450); Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 435); Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ

ID NO: 439); Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 441); Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 436); Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 454); Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 452); Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 451); Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 456); Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 437); Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 440); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 448); Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 457); Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 453); Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 458); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 446); Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 433); Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 434); Ac-Nle-c[Asp-dPhe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 488); Ac-Nle-c[Asp-dBip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 490); Ac-Nle-c[Asp-dTrp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 494); Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 443); Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 268); Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 363); Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 365); Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 370); Ac-Nle-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 378); Ac-dArg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 379); Ac-Nle-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 380); Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 418); Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH2 (SEQ ID NO: 621); Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH2 (SEQ ID NO: 666); Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 297); Ac-Nle-c[Asp-His-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 228); Ac-Nle-c[Asp-His-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 229); Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH2 (SEQ ID NO: 281); Ac-Nle-c[Asp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 355); Ac-Nle-c[Asp-Tic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 362); Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 424); Ac-

Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 366); Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 368); Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dLeu-dPro-NH2 (SEQ ID NO: 422); Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 372); Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 374); Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 639); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH2 (SEQ ID NO: 352); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 351); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Trp-NH2 (SEQ ID NO: 600); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Orn]-dVal-dPro-NH2 (SEQ ID NO: 322); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dAsn-NH2 (SEQ ID NO: 605); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Gly-Gly-NH2 (SEQ ID NO: 610); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-NH2 (SEQ ID NO: 581); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH2 (SEQ ID NO: 353); Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 319); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-dPro-NH2 (SEQ ID NO: 607); Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 638); Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 295); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH2 (SEQ ID NO: 575); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH2 (SEQ ID NO: 587); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-NH2 (SEQ ID NO: 582); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Pro-Val-NH2 (SEQ ID NO: 588); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-dPro-NH2 (SEQ ID NO: 612); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Pro-Val-NH2 (SEQ ID NO: 583); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Ala-Ala-NH2 (SEQ ID NO: 609); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dTle-NH2 (SEQ ID NO: 594); Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH2 (SEQ ID NO: 631); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Val-Pro-NH2 (SEQ ID NO: 589); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 597); Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 628); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 591); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH2 (SEQ ID NO: 590); Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 311); Ac-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 629); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Hyp-NH2 (SEQ ID NO: 574); Ac-dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 303); Ac-Nle-c[Asp-Oic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ

ID NO: 360); Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 313); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291); Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 299); Phe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 305); His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 306); Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 312); Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 314); Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 315); Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 321); Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 423); Ac-Nle-Phe-Phe-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 421); Ac-Nle-c[Cys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 383); Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 384); Ac-Lys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 387); Ac-Arg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 389); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 403); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH2 (SEQ ID NO: 407); Ac-Nle-c[Asp-Trp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 395); Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH2 (SEQ ID NO: 633); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-Pro-NH2 (SEQ ID NO: 573); Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 643); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-NH2 (SEQ ID NO: 576); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Pro-NH2 (SEQ ID NO: 577); dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 309); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 593); Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH2 (SEQ ID NO: 632); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-NH2 (SEQ ID NO: 603); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH2 (SEQ ID NO: 620); Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH2 (SEQ ID NO: 634); Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH2 (SEQ ID NO: 635); Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 644); Ac-dTyr-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 304); Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 642); dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 308); Ac-Nle-c[Asp-Atc-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 212); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 226); Ac-Nle-

c[dPen-Pro-dPhe-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 320); Ac-Nle-c[Cys-dPhe-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 324); Ac-Nle-c[Asp-Cpe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 358); Ac-Nle-c[Asp-Che-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 359); Ac-Nle-c[Asp-dPhe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 367); Ac-Nle-c[Asp-dGln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 371); Ac-Nle-c[Asp-dTrp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 373); Ac-Nle-c[Asp-dTyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 375); Ac-Arg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 381); Ac-dArg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 382); Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 385); Ac-Ala-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 386); Ac-dLys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 388); Ac-dArg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 390); Ac-dHis-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 391); Ac-His-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 392); Ac-Nle-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 393); Ac-Nle-c[Asp-Trp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 394); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH2 (SEQ ID NO: 405); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH2 (SEQ ID NO: 406); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH2 (SEQ ID NO: 408); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH2 (SEQ ID NO: 409); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 410); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 411); Ac-Nle-c[Asp-Phe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 412); Ac-Nle-c[Asp-His-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 413); Ac-Nle-c[Asp-Tyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 414); Ac-Nle-c[Asp-dPhe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 415); Ac-Nle-c[Asp-dHis-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 416); Ac-Nle-c[Asp-dTyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 417); Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 419); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 596); Ac-Nle-c[dAsp-Pro-dPhe-Arg-Trp-dLys]-dPro-dVal-NH2 (SEQ ID NO: 622); Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 645); Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 646); Ac-dLeu-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 298); Ac-

Nle-c[Asp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 354); Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 364); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Arg-NH2 (SEQ ID NO: 578); Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 300); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dArg-NH2 (SEQ ID NO: 579); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH2 (SEQ ID NO: 580); Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 640); Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 641); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH2 (SEQ ID NO: 584); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Val-Pro-NH2 (SEQ ID NO: 585); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dVal-dPro-NH2 (SEQ ID NO: 586); Ac-dNle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 301); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH2 (SEQ ID NO: 595); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH2 (SEQ ID NO: 598); Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 302); Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 630); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-dVal-NH2 (SEQ ID NO: 601); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAla-dAla-NH2 (SEQ ID NO: 602); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dHyp-NH2 (SEQ ID NO: 604); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Asp-NH2 (SEQ ID NO: 606); Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 318); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Hyp-NH2 (SEQ ID NO: 608); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-dPro-NH2 (SEQ ID NO: 611); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-NH2 (SEQ ID NO: 613); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsp-NH2 (SEQ ID NO: 614); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-NH2 (SEQ ID NO: 615); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-NH2 (SEQ ID NO: 616); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 599); Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 296); Ac-Nle-c[Asp-Aba-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 198); Ac-Nle-c[Asp-Aia-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 207); Ac-Nle-c[Asp-Ata-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 208); Ac-Nle-c[Asp-Pro-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 225); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dPro-NH2 (SEQ ID NO: 592); Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 425); Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 427); Ac-Nle-c[Asp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH2 (SEQ ID NO:

429); Ac-Nle-c[Pen-dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 325); Ac-Nle-c[dPen-dPhe-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 326); Ac-Nle-c[Asp-dIle-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 356); Ac-Nle-c[Asp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 357); Ac-Arg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 376); Ac-dArg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 377); Ac-Nle-c[Asp-Trp-dLeu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 396); Ac-Nle-c[Asp-Trp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 397); Ac-Nle-c[Asp-Trp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 398); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 400); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 401); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dPhe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 402); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 399); Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 404); Ac-Nle-c[Asp-Pro-dPhe-Arg-dTrp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 187); Ac-Nle-c[Asp-Pro-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 231); Ac-Nle-c[Asp-Pro-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 232); Ac-Nle-c[Asp-Pro-dPhe-Arg-Aia-Lys]-dVal-dPro-NH2 (SEQ ID NO: 233); Ac-Nle-c[Asp-Pro-dPhe-Arg-Aba-Lys]-dVal-dPro-NH2 (SEQ ID NO: 234); Ac-Nle-c[Asp-Pro-dPhe-Arg-Ata-Lys]-dVal-dPro-NH2 (SEQ ID NO: 235); Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 428); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 520); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 522); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 523); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 518); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 503); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 505); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 502); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 519); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 506); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 501); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 521); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 504); Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 528); Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 530); Ac-Nle-c[Asp-dTrp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-

dPro-NH2 (SEQ ID NO: 532); Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 209); Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 210); Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 211); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 512); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 513); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 511); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 515); Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 338); Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 339); Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 340); Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 341); Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 342); Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 536); Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 498); Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 499); Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 537); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 44); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 45); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 46); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 47); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 56); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 57); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 58); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 60); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 61); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 62); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 63); Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 8); and Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 258).

[0037] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IA): X1-X2-X3-R1-R2-R3-R4-R5-R6-R7-R8-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (IA), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg,

dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is Lys or dPen; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is

absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; a lactam bridge between R1 and R7 or R8 when R1 is Asp and R7 or R8 is Lys; provided that: when R4 is p(Br)dPhe, then R1 is Nle or Ala, Y4-Y7 are absent, and at least one of X1 and Y3 is absent; when R4 is p(Cl)dPhe, then (i) R3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro or (ii) R3 is His and R6 is not Trp; when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R2 is not Pro.

[0038] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IA), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln),

dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip); R4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is Lys or dPen; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that the non-naturally occurring melanocortin analog does not include a sequence selected from the group consisting of: Ac-dArg-c[Asp-

His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 539); Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 540); Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 541); Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 542); Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 543); Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 544); Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 556); Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 557); Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 558); Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 559); Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 560); Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 561); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 550); Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 554); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 220); Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 497); Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 500); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 507); Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 508); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 514); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 516); Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 517); Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 524); Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 529); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 520); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 522); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 523); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 518); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 503); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 505); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 502); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 519); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 506); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 501); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 521);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 504); Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 528); Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 530); Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 209); Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 210); Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 211); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 512); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 513); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 511); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 515); Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 338); Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 339); Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 340); Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 341); Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 342); Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 536); Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 498); Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 499); Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 537); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 44); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 45); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 46); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 47); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 56); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 57); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 58); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 60); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 61); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 62); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 63); Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 8); and Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 258).

[0039] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IA), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent

or Nle; X3 is absent or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu); R2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip); R4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is Lys or dPen; Y1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and

R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when R4 is p(Br)dPhe, then R1 is Nle or Ala, R5 is Arg, Y4-Y7 are absent, and at least one of X1 and Y3 is absent; when R4 is p(Cl)dPhe, then R3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro; and when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro and R1 is not dArg, Arg, dTyr, or Ala, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys.

[0040] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IA), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent or Nle; X3 is absent or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu); R2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip); R4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe); R5 is absent or is selected from the group

consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is Lys or dPen; Y1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that the non-naturally occurring melanocortin analog does not include a sequence selected from the group consisting of: Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 546); Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 539); Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 540); Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 556); Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 557); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 550); Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 554); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 509); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 510); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 220); Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 497); Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 500); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 507); Ac-Nle-c[Asp-His-

p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 508); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 514); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 516); Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 517); Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 524); Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 529); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 518); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 502); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 519); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 501); Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 528); Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 530); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 512); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 513); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 511); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 515); Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 329); Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 330); Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 332); Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 333); Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 338); Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 339); Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 340); Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 341); Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 342); Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 536); Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 498); Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 499); Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 537); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 44); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 45); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 46); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 47); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 56); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 57); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-

Cys]-dVal-dPro-NH2 (SEQ ID NO: 58); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 60); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 61); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 62); and Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 63).

[0041] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IB): X1-X2-X3-R1-R2-R3-dNal(2')-R5-R6-R7-R8-Y1-Y2-Y3-Y4-Y5-Y6-Y7 (IB), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen,

dPen, Orn, and D-ornithine (dOrn); R8 is absent or is Lys or dPen; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that: when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is not Ala, Leu, dLeu, dVal, or Gly, and if R3 is absent, then R2 is Pen and R7 is dCys; and when R7 is Pro or Gly, then (i) R3 is not His or (ii) R3 is His and R2 is Glu.

[0042] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IB), wherein: X1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg); X2 is absent, phenylalanine (Phe), or Nle; X3 is absent, Phe, or Nle; R1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cis-4-guanidinyl-proline (cisPro(guan)), trans-4-guanidinyl-proline (transPro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-cis-CH=CH-CO, proline (Pro), and

tryptophan (Trp); R3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, cisPro(guan), transPro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe); R5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), cisPro(guan), and transPro(guan); R6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1')); R7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn); R8 is absent or is Lys or dPen; Y1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp; Y2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn; Y3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys; Y4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp; Y5 is absent or dVal; Y6 is absent or dVal; Y7 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between R1 or R2 and R7 or R8 when each of R1 or R2 and R7 or R8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R2 and R7 or R8 when R2 is selected from the group consisting of Asp, dAsp, Glu, and CO-cis-CH=CH-CO and R7 or R8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and a lactam bridge between R1 and any one of R7-R9 when R1 is Asp and any one of R7-R9 is Lys; provided that the non-naturally occurring melanocortin analog does not include a sequence selected from the group consisting of: Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 338); Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 339); Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID

NO: 340); Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 341); Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 342); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 44); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 45); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 46); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 47); Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 56); Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 57); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 58); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 60); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 61); Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 62); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 63); Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 8); and Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 258).

[0043] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IC): X1-R1-R2-R3-R4-R5-R6-R7-Y1-Y2-Y3-Y4 (IC), wherein: X1 is absent or norleucine (Nle) R1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys); R2 is aspartic acid (Asp) or cysteine (Cys); R3 is His or proline (Pro); R4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe); R5 is Arg or His; R6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2')); R7 is Lys or Cys; Y1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle); Y2 is selected from the group consisting of dVal, dPro, and dTle; Y3 is absent or is dVal or dPro; Y4 is absent or dPro; and the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of: a disulfide bond between Cys at R2 and Cys R7; and a lactam bridge between Asp at R2 and Lys at R7; provided that: when R4 is p(Cl)dPhe, then R1 is Nle or Ala, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent.

[0044] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (IC), wherein: X1-R1-R2-R3-R4-R5-R6-R7-Y1-Y2-Y3-Y4 (IC), wherein: X1 is absent or norleucine (Nle) R1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys); R2 is aspartic acid (Asp) or cysteine (Cys); R3 is His or proline (Pro); R4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF3)dPhe); R5 is Arg or His; R6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-b]indol-3(2H)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2')); R7 is Lys or Cys; Y1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle); Y2 is selected from the group consisting of dVal, dPro, and dTle; Y3 is absent or is dVal or dPro; Y4 is absent or dPro; and the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of: a disulfide bond between Cys at R2 and Cys R7; and a lactam bridge between Asp at R2 and Lys at R7; provided that the non-naturally occurring melanocortin analog does not include a sequence selected from the group consisting of: Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 520); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 522); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 523); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 518); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 503); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 505); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 502); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 519); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 506); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 501); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 521); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 504); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 512); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 513); Ac-Nle-c[Asp-His-

p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 511); and Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 515).

[0045] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (ID): X1-R1-R2-R3-R4-R5-R6-R7-Y1-Y2-Y3-Y4 (ID), wherein: X1 is absent or norleucine (Nle); R1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is aspartic acid (Asp) or cysteine (Cys); R3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip); R4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is selected from the group consisting of Arg, Lys, and His; R6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2')); R7 is Lys or Cys; Y1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle); Y2 is dVal or dPro; Y3 is absent, dVal, or dPro; Y4 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between Cys at R2 and Cys at R7; and a lactam bridge between Asp at R2 and Lys at R7; provided that: when R4 is p(Br)dPhe and R1 is Nle or Ala, then the C-terminus is not dVal-dPro or dTle-dPro and if the C-terminus is dPro-dVal-dPro, then X1 is present. when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7; when R4 is dPhe, then R3 is Pro and either R5 is Lys or R6 is dNal(2') or Nal(2'); and when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, and Gln, R6 is Trp, and either X1 and Y3 are both present or X1 and Y3 are both absent.

[0046] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence according to Formula (ID), wherein: R1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys) R2 is aspartic acid (Asp) or cysteine (Cys); R3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro),

phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip); R4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe); R5 is selected from the group consisting of Arg, Lys, and His; R6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2')); R7 is Lys or Cys; Y1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle); Y2 is dVal or dPro; Y3 is absent, dVal, or dPro; Y4 is absent or dPro; and the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of: a disulfide bond between Cys at R2 and Cys at R7; and a lactam bridge between Asp at R2 and Lys at R7; provided that the non-naturally occurring melanocortin analog does not include a sequence selected from the group consisting of: Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 217); Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 562); Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 563); Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 565); Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 567); Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 569); Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 571); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 222); Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 535); Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 538); Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 545); Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 546); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 547); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 548); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 552); Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 553); Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 555); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 551); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 223); Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 464); Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 465); Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 466); Ac-His-

c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 467); Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 468); Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 469); Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 470); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 474); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 475); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 476); Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 477); Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 478); Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 481); Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 482); Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 483); Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 484); Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 485); Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 459); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 472); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 471); Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 463); Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 462); Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 479); Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 473); Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 480); Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 486); Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 491); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 218); Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 442); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 449); Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 455); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 447); Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 438); Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 450); Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 435); Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 439); Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 441); Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 436); Ac-

Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 454); Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 452); Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 451); Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 456); Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 437); Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 440); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 448); Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 457); Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 453); Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 458); Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 443); Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 363); Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 365); Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 370); Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH2 (SEQ ID NO: 621); Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 297); Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 366); Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 368); Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 372); Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 374); Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 639); Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 638); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 295); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 597); Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 628); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 591); Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 311); Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 313); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291); Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 299); His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 306); Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 312); Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 314); Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 315); Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 643); dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 309); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-

OH (SEQ ID NO: 617); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH2 (SEQ ID NO: 620); Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 644); Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 642); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 596); Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 645); Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 646); Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 300); Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 640); Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 641); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH2 (SEQ ID NO: 595); Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH2 (SEQ ID NO: 598); Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 302); Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 425); Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 318); Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 215); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 509); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 510); Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 525); Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 527); Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 531); Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 533); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 520); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 522); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 523); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 518); Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 503); Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 505); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 502); Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 519); Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 506); Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 501); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 521); Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 504); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 512); Ac-Nle-c[Asp-His-

p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 513); and Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 515).

[0047] In some embodiments, an N-terminus of the non-naturally occurring melanocortin analog, if present, is modified by an acyl group.

[0048] In some embodiments, the acyl group is an acetyl group.

[0049] In some embodiments, an N-terminus of the non-naturally occurring melanocortin analog, if present, is not modified.

[0050] In some embodiments, a C-terminus of the non-naturally occurring melanocortin analog is modified by an amide group.

[0051] In some embodiments, a C-terminus of the non-naturally occurring melanocortin analog is not modified.

[0052] In some embodiments, R4 is dNal(2').

[0053] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence cyclized.

[0054] In some embodiments, R3 is Pro, Hyp, or His.

[0055] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro (SEQ ID NO: 2); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 3); Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 4); Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 5); Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dLeu-dPro-NH2 (SEQ ID NO: 6); Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 7); Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 9); and Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dPro-dVal-NH2 (SEQ ID NO: 10), wherein c represents cyclization through R1 or R2 and R7 via a lactam bond.

[0056] In some embodiments, R9 is present.

[0057] In some embodiments, wherein the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-c[Asp-Phe-Phe-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 11), wherein c represents cyclization through R1 and R9 via a lactam bond.

[0058] In some embodiments, R9 is absent and X1-X3 are present.

[0059] In some embodiments, the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-Phe-Phe-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 12), wherein c represents cyclization through R1 and R8 via a lactam bond.

[0060] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence cyclized between R2 and R7 via a lactam bond or a disulfide bond.

[0061] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[dAsp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 38); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dLys]-dVal-dPro-NH2 (SEQ ID NO: 39); Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 40); Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 41); Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 42); Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 43); Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 48); Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 49); Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 50); Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 51); Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 52); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH2 (SEQ ID NO: 53); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 54); Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 55); Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH2 (SEQ ID NO: 59); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH2 (SEQ ID NO: 64); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH2 (SEQ ID NO: 65); Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH2 (SEQ ID NO: 66); Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH2 (SEQ ID NO: 67); and c[CO-cis-CH = CH-CO-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 197), wherein c represents cyclization through R1 or R2 and R7 via a lactam bond or a disulfide bond.

[0062] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence cyclized through a lactam bond between Asp at R1 or R2 and Lys at R7.

[0063] In some embodiments, R1 is selected from the group consisting of dArg, dMet, dIle, dLeu, dVal, dAla, Ala, Tle, dTle, dNle, Nva, Gly, dPro, dCys, dPhe, dGln, dAsn, transPro(guan), cisPro(guan), dTyr, Tyr, and Dmt.

[0064] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-dArg-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 15); Ac-dMet-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 16); Ac-dIle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 17); Ac-dLeu-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 18); Ac-dVal-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 19); Ac-dAla-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 20); Ac-Ala-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 21); Ac-Tle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 22); Ac-dTle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 23); Ac-dNle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 24); Ac-Nva-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 25); Ac-Gly-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 26); Ac-dPro-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 27); Ac-dCys-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 28); Ac-dPhe-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 29); Ac-dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 30); Ac-dGln-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 31); Ac-dAsn-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 32); Ac-transPro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 33); Ac-cisPro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 34); dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 35); Tyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 36); and Dmt-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 37), wherein c represents cyclization through R2 and R7 via a lactam bond.

[0065] In some embodiments, R3 is absent or selected from the group consisting of Ala, dAla, dMet, Gly, Leu, Ile, Val, dLeu, dIle, dVal, Trp, transPro(guan), cisPro(guan), b-Ala, Mamb, Acpc, Aba, Aia, Aic, Cpe, Che, Oic, Tic, and Glu.

[0066] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 68); Ac-Nle-c[Asp-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 69); Ac-Nle-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 71); Ac-Nle-c[Asp-dMet-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 72); Ac-Nle-c[Asp-Pro-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 73); Ac-Nle-c[Asp-Gly-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 74); Ac-Nle-c[Asp-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 75); Ac-Nle-c[Asp-Leu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 76); Ac-Nle-c[Asp-Ile-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 77); Ac-Nle-c[Asp-Val-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 78); Ac-Nle-c[Asp-dLeu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 79); Ac-Nle-c[Asp-dIle-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 80); Ac-Nle-c[Asp-dVal-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 81); Ac-Nle-c[Asp-Trp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 82); Ac-Nle-c[Asp-transPro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 84); Ac-Nle-c[Asp-cisPro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 85), Ac-Nle-c[Asp-β-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 199); Ac-Nle-c[Asp-Mamb-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 200); Ac-Nle-c[Asp-Acpc-dNal(2') Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 201); Ac-Nle-c[Asp-Aba-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 204); Ac-Nle-c[Asp-Aia-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 205); Ac-Nle-c[Asp-Aic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 239); Ac-Nle-c[Asp-Cpe-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 240); Ac-Nle-c[Asp-Che-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 241); Ac-Nle-c[Asp-Oic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 242); Ac-Nle-c[Asp-Tic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 244); and Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 255), wherein c represents cyclization through R1 or R2 and R7 via a lactam bond.

[0067] In some embodiments, R5 is absent or selected from the group consisting of Lys, Orn, His, Ala, transPro(guan), cisPro(guan), and Glu.

[0068] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-dNal(2')-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 86); Ac-Nle-c[Asp-Pro-dNal(2')-Lys-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 87); Ac-Nle-c[Asp-Pro-dNal(2')-Orn-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 90); Ac-Nle-c[Asp-Pro-dNal(2')-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 92); Ac-Nle-c[Asp-Pro-dNal(2')-Ala-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 93); Ac-Nle-c[Asp-Pro-dNal(2')-Glu-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 96); Ac-Nle-c[Asp-His-dNal(2')-transPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 247); Ac-Nle-c[Asp-His-dNal(2')-cisPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 248); Ac-Nle-c[Asp-Pro-dNal(2')-transPro(guan)-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 250); and Ac-Nle-c[Asp-Pro-dNal(2')-cisPro(guan)Pro-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 251), wherein c represents cyclization through R2 and R7 via a lactam bond.

[0069] In some embodiments, R6 is selected from the group consisting of Nal(1'), dNal(1'), Aia, Phe, dPhe, Tyr, dTyr, dNal(2'), dTrp, Aba, and Ata.

[0070] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Nal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 102); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aia-Lys]-dVal-dPro-NH2 (SEQ ID NO: 103); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Phe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 104); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Tyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 105); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 108); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dPhe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 109); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(2']-Lys]-dVal-dPro-NH2 (SEQ ID NO: 110); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 111); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTrp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 196); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aba-Lys]-dVal-dPro-NH2 (SEQ ID NO: 253); and Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Ata-Lys]-dVal-dPro-NH2 (SEQ ID NO: 254), wherein c represents cyclization through R2 and R7 via a lactam bond.

[0071] In some embodiments, (i) Y1 is selected from dPro, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, Lys, dLys, Trp, and dTIe and Y2 is absent or selected from dVal, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn,

and dTle; or (ii) Y1 is dVal, Y2 is dPro, and the C-terminus of the non-naturally occurring melanocortin analog is not modified.

[0072] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Pro-NH2 (SEQ ID NO: 115); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 116); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 117); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Hyp-NH2 (SEQ ID NO: 118); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dHyp-NH2 (SEQ ID NO: 119); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Hyp-NH2 (SEQ ID NO: 120); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-dHyp-NH2 (SEQ ID NO: 121); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-dVal-NH2 (SEQ ID NO: 122); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-dVal-NH2 (SEQ ID NO: 123); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-Val-NH2 (SEQ ID NO: 124); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-Val-NH2 (SEQ ID NO: 125); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-NH2 (SEQ ID NO: 126); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-NH2 (SEQ ID NO: 127); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-NH2 (SEQ ID NO: 128); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-NH2 (SEQ ID NO: 129); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-NH2 (SEQ ID NO: 130); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Pro-NH2 (SEQ ID NO: 131); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-NH2 (SEQ ID NO: 132); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-NH2 (SEQ ID NO: 133); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-NH2 (SEQ ID NO: 134); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-NH2 (SEQ ID NO: 135); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-dAla-NH2 (SEQ ID NO: 136); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-Ala-NH2 (SEQ ID NO: 137); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Gly-Gly-NH2 (SEQ ID NO: 138); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asp-NH2 (SEQ ID NO: 139); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Arg-NH2 (SEQ ID NO: 140); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asn-NH2 (SEQ ID NO: 141); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsp-NH2 (SEQ ID NO: 142); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dArg-NH2 (SEQ ID NO: 143); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsn-NH2 (SEQ ID NO: 144); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-dPro-NH2 (SEQ ID NO: 145); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-NH2 (SEQ ID NO: 146); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-dPro-NH2 (SEQ ID NO: 147); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-dPro-NH2

(SEQ ID NO: 148); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-NH2 (SEQ ID NO: 149); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-dPro-NH2 (SEQ ID NO: 150); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-NH2 (SEQ ID NO: 151); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-NH2 (SEQ ID NO: 152); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-NH2 (SEQ ID NO: 153); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-NH2 (SEQ ID NO: 154); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-NH2 (SEQ ID NO: 155); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-NH2 (SEQ ID NO: 156); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Pro-Val-NH2 (SEQ ID NO: 157); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-dVal-NH2 (SEQ ID NO: 158); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-dVal-NH2 (SEQ ID NO: 159); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-NH2 (SEQ ID NO: 160); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-NH2 (SEQ ID NO: 161); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Val-Pro-NH2 (SEQ ID NO: 162); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dVal-dPro-NH2 (SEQ ID NO: 163); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dVal-dPro-NH2 (SEQ ID NO: 164); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Pro-Val-NH2 (SEQ ID NO: 165); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-dVal-NH2 (SEQ ID NO: 166); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-dVal-NH2 (SEQ ID NO: 167); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Val-Pro-NH2 (SEQ ID NO: 168); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dVal-dPro-NH2 (SEQ ID NO: 169); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dVal-dPro-NH2 (SEQ ID NO: 170); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-dPro-NH2 (SEQ ID NO: 171); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 172); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-NH2 (SEQ ID NO: 173); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-NH2 (SEQ ID NO: 174); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dPro-NH2 (SEQ ID NO: 175); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 176); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dTle-NH2 (SEQ ID NO: 177); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dTle-NH2 (SEQ ID NO: 178); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Trp-NH2 (SEQ ID NO: 203); and Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-dLys-dAsp-NH2 (SEQ ID NO: 263), wherein c represents cyclization through R2 and R7 via a lactam bond.

[0073] In some embodiments, one or more of Y3-Y7 are present and are each independently dVal or dPro.

[0074] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dPro-NH2 (SEQ ID NO: 179); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 180); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 181); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH2 (SEQ ID NO: 182); and Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 183), wherein c represents cyclization through R2 and R7 via a lactam bond.

[0075] In some embodiments, one or more of X1-X3 are present and are Nle.

[0076] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 184); Ac-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 185); and Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 186), wherein c represents cyclization through R2 and R7 via a lactam bond.

[0077] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence cyclized through a lactam bond between (i) Asp at R1 and Lys at R7, (ii) Asp at R2 and Lys at R8, or (ii) Asp at R1 and Lys at R8.

[0078] In some embodiments, R2 is selected from Asp, Trp, Pro, and Glu, R3 is selected from Pro, Glu, and His, and R7 is selected from Lys, Pro, and Gly.

[0079] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 194); Ac-Nle-c[Asp-Trp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 195); Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 257); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH2 (SEQ ID NO: 245); Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 256); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 259); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH2 (SEQ ID NO: 260); Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH2 (SEQ ID NO: 261); Ac-Glu-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH2 (SEQ ID NO: 262); Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 264); and Ac-Nle-c[Asp-Glu-His-

dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2 (SEQ ID NO: 265), wherein c represents cyclization through R1 or R2 and R7 or R8 via a lactam bond.

[0080] In some embodiments, one of R2 and R3 is Ala or dAla.

[0081] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 266); Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 267); Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 269); Ac-dArg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 270); Ac-Arg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 271); Ac-dArg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 272); Ac-Nle-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 273); Ac-Arg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 274); Ac-dArg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 275); Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-NH2 (SEQ ID NO: 282); and Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-NH2 (SEQ ID NO: 283), wherein c represents cyclization through R1 or R2 and R7 via a lactam bond or a disulfide bond.

[0082] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence cyclized through a disulfide bond between dPen at R2 and dPen at R7 or R8.

[0083] In some embodiments, R1 is selected from the group consisting of Nle, dLeu, dNle, dArg, Arg, dPhe, dTyr, Ala, dHis, His, dLys, and Lys.

[0084] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-dLeu-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 327); Ac-dNle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 328); Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 329); Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 330); Ac-dPhe-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 331); Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 332); Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 333); Ac-dHis-c[dPen-Pro-dNal(2')-Arg-Trp-

dPen]-dVal-dPro-NH2 (SEQ ID NO: 334); Ac-His-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 335); Ac-dLys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 336); Ac-Lys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH2 (SEQ ID NO: 337); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dVal-dPro-NH2 (SEQ ID NO: 344); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dVal-dPro-NH2 (SEQ ID NO: 345); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dPro-NH2 (SEQ ID NO: 346); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dPro-NH2 (SEQ ID NO: 347); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dHyp-NH2 (SEQ ID NO: 348); Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dTle-dPro-NH2 (SEQ ID NO: 349); and Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Gly-dPen]-dVal-dPro-NH2 (SEQ ID NO: 350), wherein c represents cyclization through R1 or R2 and R7 or R8 via a disulfide bond.

[0085] In some embodiments, the non-naturally occurring melanocortin analog is linear.

[0086] In some embodiments, the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-Asp-Pro-dNal(2')-Arg-Trp-Lys-dVal-dPro-NH2 (SEQ ID NO: 13); or Ac-Nle-Pro-dNal(2')-Arg-Trp-dVal-dPro-NH2 (SEQ ID NO: 14).

[0087] In some embodiments, R4 is selected from the group consisting of dPhe, p(Cl)dPhe p(I)dPhe, p(Br)dPhe, p(F)dPhe, or p(CF3)dPhe.

[0088] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of: Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 215); Ac-Nle-c[Asp-Pro-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 216); Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 217); Ac-Nle-c[Asp-Pro-p(CF3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 219); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 220); Ac-Nle-c[Asp-His-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 221); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 222); Ac-Nle-c[Asp-His-p(CF3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 224); Ac-Nle-c[Asp-Pro-p(CF3)dPhe-Arg-Aia-Lys]-dVal-dPro-NH2 (SEQ ID NO: 236); Ac-Nle-c[Asp-Pro-p(CF3)dPhe-Arg-Aba-Lys]-dVal-dPro-NH2 (SEQ ID NO: 237); Ac-Nle-c[Asp-Pro-p(CF3)dPhe-Arg-Ata-Lys]-dVal-dPro-NH2 (SEQ ID NO: 238); Ac-Nle-c[Asp-dBip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 369); Ac-Nle-c[Asp-Pro-

dPhe-Lys-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 426); Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 430); Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 431); Ac-Nle-c[Cys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 432); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 444); Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 445); Ac-Nle-c[Asp-Phe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 487); Ac-Nle-c[Asp-Bip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 489); Ac-Nle-c[Asp-Trp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 493); Ac-Nle-c[Asp-Tyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 495); Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 497); Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 500); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 507); Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 508); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 509); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 510); Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 514); Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 516); Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 517); Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 524); Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 525); Ac-Nle-c[Asp-dPhe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 526); Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 527); Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 529); Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 531); Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 533); Ac-Nle-c[Asp-dTyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 534); Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH2 (SEQ ID NO: 535); Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 538); Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 539); Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 540); Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 541); Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 542); Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 543); Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 544); Ac-Nle-Nle-c[Asp-His-

p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 545); Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 546); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 547); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 548); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH2 (SEQ ID NO: 549); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH2 (SEQ ID NO: 550); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 551); Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 552); Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 553); Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH2 (SEQ ID NO: 554); Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 555); Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 556); Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 557); Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 558); Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 559); Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 560); Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH2 (SEQ ID NO: 561); Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 562); Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 563); Ac-Nle-c[Asp-dPhe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 564); Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 565); Ac-Nle-c[Asp-dBip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 566); Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 567); Ac-Nle-c[Asp-dGln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 568); Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 569); Ac-Nle-c[Asp-dTrp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 570); Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 571); and Ac-Nle-c[Asp-dTyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 572), wherein c represents cyclization through R2 and R7 via a lactam bond or a disulfide bond.

[0089] In some embodiments, the non-naturally occurring melanocortin analog includes any one of the sequences of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-

337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572.

[0090] In some embodiments, the non-naturally occurring melanocortin analog includes any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, 571-572.

[0091] In some embodiments, the non-naturally occurring melanocortin analog includes any one of the sequences of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, 571-572.

[0092] In some embodiments, the non-naturally occurring melanocortin analog includes any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350.

[0093] In some embodiments, the non-naturally occurring melanocortin analog includes any one of the sequences of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, 538-561.

[0094] In some embodiments, the non-naturally occurring melanocortin analog includes any one of the sequences of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, 556-561.

[0095] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence of SEQ ID NO: 3.

[0096] In some embodiments, the non-naturally occurring melanocortin analog is present in a pharmaceutical composition.

[0097] In some embodiments, the pharmaceutical composition includes one or more pharmaceutically acceptable excipients and/or carriers.

[0098] In some embodiments, the one or more pharmaceutically acceptable excipients and/or carriers of the pharmaceutical composition include water.

[0099] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg to about 20 mg/kg administered once a day for about 5 days to about 10 days; (ii) at a second dose of about 10 mg/kg to about 40 mg/kg administered once a day after administration of the first dose for about 5 days to about 10 days; (iii) at a third dose of about 5 mg/kg to about 30 mg/kg administered twice a day after administration of the second dose for at least about 5 days to about 10 days.

[0100] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 15 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 10 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

[0101] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 10 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 20 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 15 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

[0102] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 15 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 25 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 20 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

[0103] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 0.5 mg/kg to about 10 mg/kg per body weight of the subject once daily.

[0104] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 1 mg/kg or 3 mg/kg per body weight of the subject once daily.

[0105] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 0.1 mg to about 100 mg once daily.

[0106] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg or about 50 mg once daily.

[0107] In some embodiments, the non-naturally occurring melanocortin analog is administered via intraperitoneal, intravenous, parenteral, subcutaneous, intramuscular, intracerebroventricular, intranasal, or oral administration.

[0108] In some embodiments, the non-naturally occurring melanocortin analog crosses a blood-brain-barrier of a subject.

[0109] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence of SEQ ID NO: 3 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg per body weight of the subject.

[0110] In some embodiments, the non-naturally occurring melanocortin analog includes a sequence of SEQ ID NOs: 3 and is administered at least once daily in an amount ranging from 0.5 mg/kg to 10 mg/kg per body weight of the subject.

[0111] In some embodiments, the non-naturally occurring melanocortin analog is administered to a subject for at least 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, or 5 years.

[0112] In some embodiments, the non-naturally occurring melanocortin analog is administered to a subject for 1 day, 5 days, 7 days, 14 days, 21 days, 28 days, 35 days, 40 days, 45 days, 50 days, 60 days, 75 days, 90 days, 100 days, 110 days, or 120 days.

[0113] In some embodiments, the method or the use further includes maintaining muscle mass or promoting muscle mass gain in the subject.

DETAILED DESCRIPTION

[0114] The present technology comprises non-naturally occurring melanocortin analogs, or pharmaceutically acceptable salts, solvates, or stereoisomers thereof, collectively referred to herein as melanocortin analogs, for modulating weight in subjects in need thereof. In some embodiments, the non-naturally occurring melanocortin analog is a non-naturally occurring melanocortin analog. The non-naturally occurring melanocortin analogs may be useful in treating, preventing, or reducing one or more symptoms or conditions associated with weight loss. For example, the non-naturally occurring melanocortin analogs may be used to treat, prevent, or otherwise ameliorate one or more of anorexia, cachexia, muscle mass loss, fat mass loss, wasting, reduced appetite, and loss of appetite. Cachexia may include cancer-induced cachexia or drug-induced cachexia.

[0115] In some embodiments, the present technology comprises methods of treating, preventing, reducing, or otherwise ameliorating one or more symptoms or conditions associated with metabolic dysfunction in a subject in need thereof. The methods comprise administering a non-naturally occurring melanocortin analog of the present technology to the subject. In some embodiments, the method comprises increasing a level of, reducing a loss of, or maintaining an appetite, a weight, a body mass index (BMI) measurement, a fat mass, or a cardiac mass in the subject.

[0116] The present technology comprises methods of treating, preventing, or reducing one or more symptoms or conditions associated with weight loss in a subject in need thereof using a non-naturally occurring melanocortin receptor antagonist. In some embodiments, the method comprises preventing or reducing loss of lean mass (e.g., muscle, organ, and bone mass) in a subject using a non-naturally occurring melanocortin analog. In some embodiments, the method comprises preventing or reducing loss of lean mass in a subject using a non-naturally occurring melanocortin analog. In some embodiments, the method comprises promoting weight loss in a subject, comprising administering a weight loss agent and a non-naturally occurring melanocortin analog to the subject, wherein the subject's weight is decreased by loss of fat mass while maintaining or increasing muscle mass. In some embodiments, the non-naturally occurring melanocortin analogs may prevent or reduce the loss of lean mass, e.g., muscle and bone mass, associated with weight loss.

[0117] The following description is merely exemplary in nature and is not intended to limit the present technology, its applications, or its uses. It should be understood that throughout the drawings, corresponding reference numerals indicate like or corresponding parts and features. The description of specific examples indicated in various embodiments of the present technology are intended for purposes of illustration only and are not intended to limit the scope of the present technology disclosed herein. Moreover, recitation of multiple embodiments having stated features is not intended to exclude other embodiments having additional features or other embodiments incorporating different combinations of the stated features.

[0118] Furthermore, the detailed description herein is presented for purposes of illustration only and not of limitation. For example, steps recited in any method or process may be executed in any order and are not limited to the order presented. Moreover, any of the steps thereof may be outsourced to or performed by one or more third parties.

Definitions

[0119] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by those of ordinary skill in the art to which the present technology belongs. For the purposes of the present technology, the following terms are defined below.

[0120] The articles "a" and "an" are used herein to refer to one or to more than one (i.e., to at least one) of the grammatical object of the article. By way of example, "an element" means one element or more than one element. Likewise, any reference to singular includes plural embodiments, and any reference to more than one component may include a singular embodiment.

[0121] The term "about" means a quantity, level, value, number, frequency, percentage, dimension, size, amount, weight or length that varies by acceptable levels in the art. Typically, such variation may be as much 10% above and below a reference quantity, level, value, number, frequency, percentage, dimension, size, amount, weight or length and such variation may be influenced by standard applicable measurement practices.

When the term "about" is used in conjunction with a numerical range, it modifies that range by extending the boundaries above and below the numerical values set forth.

[0122] The terms "administering" or "administer" include delivery of therapies (e.g., non-naturally occurring melanocortin analogs (also referred to herein as peptides)) of the present technology to a subject either by local or systemic administration. Administration may be topical (including ophthalmic and to mucous membranes including vaginal and rectal delivery), pulmonary (e.g., by inhalation or insufflation of powders or aerosols, including by nebulizer), intratracheal, intranasal, epidermal and transdermal, oral or parenteral. Parenteral administration includes intravenous, intraarterial, subcutaneous, intraperitoneal or intramuscular injection or infusion; or intracranial, e.g., intrathecal or intraventricular, administration.

[0123] The terms "active ingredient" and "active compound" refer to a biologically active substance, whether naturally or non-naturally occurring, that is the main component of the pharmaceutical composition which elicits the intended effect of an administered therapeutic. This may be any component that drives the pharmacological activity or direct effect in the diagnosis, cure, mitigation, treatment, or prevention of the conditions associated with the present technology, such as but not limited to, reduced appetite and weight loss.

[0124] As used herein, a "composition" or a "pharmaceutical composition" refers to a mixture of the active ingredient with other chemical components, such as pharmaceutically acceptable carriers and/or excipients.

[0125] As used herein, a "pharmaceutically acceptable carrier" of the first or the second pharmaceutical composition refers to a carrier or diluent that does not cause significant irritation to an organism, does not abrogate the biological activity and properties of the administered active ingredient, and/or does not interact in a deleterious manner with the other components of the composition in which it is contained. The term "carrier" encompasses any excipient, binder, diluent, filler, salt, buffer, solubilizer, lipid, stabilizer, or other material well known in the art for use in pharmaceutical formulations. The choice of a carrier for use in a composition will depend upon the intended route of administration for the composition. The preparation of pharmaceutically acceptable carriers and formulations containing these materials is described in, e.g., Remington's Pharmaceutical Sciences, 21st

Edition, ed. University of the Sciences in Philadelphia, Lippincott, Williams & Wilkins, Philadelphia Pa., 2005, which is incorporated herein by reference in its entirety). Some examples of physiologically acceptable carriers include antioxidants including ascorbic acid; low molecular weight (less than about 10 residues) polypeptides; proteins, such as serum albumin, gelatin, or immunoglobulins; hydrophilic polymers such as polyvinylpyrrolidone; amino acids such as glycine, glutamine, asparagine, arginine or lysine; monosaccharides, disaccharides, and other carbohydrates including glucose, mannose, or dextrins; chelating agents such as EDTA; sugar alcohols such as mannitol or sorbitol; salt-forming counterions such as sodium; and/or nonionic surfactants such as TWEEN® (ICI, Inc.; Bridgewater, N.J.), polyethylene glycol (PEG), and PLURONICS™ (BASF; Florham Park, N.J.). An "excipient" of the first or the second pharmaceutical composition refers to an inert substance added to a composition to further facilitate administration of a compound. Examples, without limitation, of excipients include calcium carbonate, calcium phosphate, various sugars and types of starch, cellulose derivatives, gelatin, vegetable oils, and polyethylene glycols.

[0126] The terms "treat," "treatment," and "treating" refer to a manner of providing a pharmaceutical composition and/or melanocortin analog to alleviate disease outcomes. This includes utilizing administration techniques as described in the context of the present technology. Efficacy of treatment may be determined by various assessment methods as described in the context of the present technology (e.g., assessment of appetite, food consumption, body weight, muscle mass, fat mass, and measurement of biomarkers). The term "biomarker" refers to a biological output that is used as a measure of cellular response, whether that be to assess response to therapeutics, disease status, such as cachexia, or as a predictor of clinical outcomes. Biomarkers evaluated in the context of cells, tissue, or whole organisms. The term "disease" herein refers to any disorder adversely affecting biological status. This includes weight-related disorders, such as cachexia. Disease also may be in the context of human and animal health.

[0127] The terms "treat," "treatment," and "treating" may also refer to the reduction or inhibition of the progression and/or duration of a disease or disorder (e.g., metabolic disease, including, but not limited to, cachexia), the reduction or amelioration of the severity of the disease or disorder, and/or the amelioration of one or more symptoms thereof resulting from the administration of one or more therapies. Specifically, these terms may refer to: (1) a

stabilization, reduction, or elimination of the disease or disorder, (2) inhibiting exacerbation of the disease or disorder, (3) relieving to some extent (or, preferably, eliminating) one or more symptoms associated with a pathology related to or caused in part by unregulated or aberrant metabolism, (4) an increase in disease-free, relapse-free, progression-free, and/or overall survival, duration, or rate, (5) a decrease in hospitalization rate, and (6) a decrease in hospitalization length. The terms "treat," "treatment," and "treating" include prophylactic and/or therapeutic treatments. If it is administered prior to clinical manifestation of a condition, the treatment is considered prophylactic. Therapeutic treatment includes, e.g., ameliorating or reducing the severity of a disease or disorder, or shortening the length or frequency of the disease or disorder.

[0128] As used herein, the terms "effective amount" or "therapeutically effective amount," refer to that amount of the active ingredient being administered which will relieve to some extent one or more of the symptoms of the disease or disorder being treated. The result may be a reduction and/or alleviation of the signs, symptoms, or causes of a disease or disorder, or any other desired alteration of a biological system. An appropriate "effective amount" may differ from one individual to another. An appropriate "effective amount" in any individual case may be determined using techniques, such as a dose escalation study.

[0129] The term "after administration" refers to any duration of time after the non-naturally occurring melanocortin analog or pharmaceutical composition thereof has been administered to a subject. "After administration" may also refer to the duration of time after one dose has been completed or after more than one dose has been completed, such as two doses, three doses, four doses, and the like. In some embodiments, "after administration" refers to completion of dosing regimen that includes one or more doses. Likewise, the term "prior to" refers to any duration of time before the non-naturally occurring melanocortin analog or pharmaceutical composition thereof has been administered to a subject. Unless otherwise specified, durations of time encompassed by "after administration" or "prior to administration" may include seconds, minutes, hours, days, weeks, months, and years.

[0130] "Appetite" in a subject and/or patient is typically assessed by their desire to eat and/or the amount of food they consume. As used herein, appetite may be assessed through

a daily questionnaire given at specified or random times of the day. In the questionnaire, subjects or patients rate their hunger and/or desire to eat greater varieties of food using scales ranging from 0 (not at all) to 100 (extremely).

[0131] "Cachexia" refers to a state of general ill health and malnutrition characterized by loss of body mass including loss of weight, loss of muscle mass (skeletal, smooth, and/or cardiac muscle), loss of fat mass, or a combination thereof, and wasting. It is often associated with and induced by certain diseases or conditions such as, but not limited to, cancer, cystic fibrosis, or AIDS. The term "cancer cachexia" refers to cachexia induced by cancer. Diagnostic criterion for cachexia may include (i) weight loss of greater than 5% over past 6 months; (ii) weight loss of greater than 2% in patients with a body mass index (BMI) less than 20 kg/m^2; or (iii) weight loss of greater than 2% in patients with sarcopenia (or appendicular skeletal muscle index consistent with sarcopenia). See Fearon K, et al., *Lancet Oncol.* 12(5):489-95 (2011). Cachexia may be used interchangeably with the term "Protein-Energy Wasting" (i.e., PEW).

[0132] "Anorexia" refers to a loss of appetite, whether brought on by medical, physiological, or psychological factors. Anorexia is often closely associated with, and generally contributes to, cachexia seen in patients with advanced cancers and other conditions.

[0133] The term "Body Mass Index" or "BMI" refers to a value derived from an individual's body weight and height. Specifically, BMI is determined by body weight (kilograms) divided by the square of height (m^2) and is expressed in units of "kg/m^2." "Normal" BMI ranges are known to a person of ordinary skill in the art and consider factors such as patient sex, age, height, race, and body type. Typically, a normal BMI range is about 18.5 kg/m^2 to about 25 kg/m^2.

[0134] The terms "subject" and "patient" refer to anyone being evaluated for disease, disorder, or condition or being administered a therapeutic or pharmaceutical composition. This includes people without diagnosed or confirmed disease or condition. This also includes people with diagnosed or confirmed disease or condition, such as cancer, loss of appetite, nausea, emesis, anorexia, or cachexia.

[0135] The term "control subject," as used herein, refers to any subject used as a basis for comparison to the subject (e.g., test subject). A control subject includes, but is not limited to, any subject who has not been administered the therapeutic or pharmaceutical composition (e.g., the non-naturally occurring melanocortin analog, a therapeutically effective amount of the non-naturally occurring melanocortin analog or a pharmaceutical composition thereof) or administered a placebo.

[0136] "Melanocortin analogs," "non-naturally occurring melanocortin analogs," "melanocortin peptides," "melanocortin receptor peptides," or "melanocortins," are used interchangeably and refer to melanocortin-receptor ligands, which are macromolecules containing at least one melanocortin pharmacophore. Melanocortin analogs are typically peptides that bind melanocortin receptors under physiological conditions. Melanocortin analogs include naturally occurring non-naturally occurring melanocortin analogs (i.e., "synthetic peptides" or "synthetic analogs") and truncated and/or modified versions of melanocortin full-length protein or peptides. For example, the full-length pro-opiomelanocortin protein (POMC), prior to proteolytic cleavage of "sub-peptides," consists of 241 amino acids. Tissue-specific proteolytic cleavage of POMC yields peptides ranging in size from 13 amino acids to 76 amino acids. See Bicknell and Lawry, Encyclopedia of Stress, vol. 3, 257-265, Academic Press (2000). Synthesized, non-naturally occurring melanocortin analogs having increased melanocortin receptor activity as discussed herein are approximately 7-12 amino acids in size. Melanocortin analogs exhibit binding functionality with melanocortin receptors. The binding to the melanocortin receptor is inhibitory (antagonist). In addition to peptides, the non-naturally occurring melanocortin analogs include small molecule analogs of melanocortin or portions thereof comprised of organic compounds, inorganic compounds, or combinations of peptide and small molecule—i.e., peptide mimetics, or various combinations thereof. "Non-naturally occurring melanocortin analogs" may be structurally similar and/or functionally similar to biological melanocortin proteins in their ability to bind melanocortin receptors. Further, the melanocortin analogs generally contain the pharmacophore: His-Phe-Arg-Trp (SEQ ID NO: 1) or a modified version thereof, or a structural or functional peptide mimetic thereof.

[0137] A "pharmacophore" is the minimum set of amino acid residues necessary to achieve a physiological effect; or a small molecule that is (with respect to a receptor) a structural mimic of the amino acid residues required for binding to and activation of a receptor. His-Phe-Arg-Trp (SEQ ID NO: 1) and their analogs are the pharmacophore of melanocortin for the regulated physiological effect. Therefore, non-naturally occurring melanocortin pharmacophore analogs may be small peptides or organic molecules designed to mimic the appearance or function (including activation or deactivation of receptor activity) of the melanocortin pharmacophore core sequence peptide.

[0138] A melanocortin receptor "agonist" is a naturally occurring substance or manufactured drug substance or composition that may interact with a melanocortin receptor and initiate a pharmacological response characteristic of the melanocortin receptor.

[0139] A melanocortin receptor "antagonist" is a naturally occurring substance or manufactured drug substance or composition that opposes the melanocortin receptor-associated responses normally induced by a melanocortin receptor agonist agent.

[0140] "Potentiated therapeutic activity" refers to an increase in melanocortin activity in a non-naturally occurring melanocortin analog that has undergone derivatization at the N- and/or C-terminus. Such derivatizations do not necessarily involve the pharmacophore, but do imply a relative increase in in vivo biological half-life.

[0141] The terms "bind," "binding," "complex," and "complexing," refer to all types of physical and chemical binding, reactions, complexing, attraction, chelating and the like.

[0142] The "peptides" of the present technology may be (a) naturally-occurring, (b) produced by chemical synthesis, (c) produced by recombinant DNA technology, (d) produced by biochemical or enzymatic fragmentation of larger molecules, (e) produced by methods resulting from a combination of methods (a) through (d) listed above, or (f) produced by any other means for producing peptides.

[0143] The term "peptide" as used herein includes any structure comprised of two or more amino acids, including chemical modifications and derivatives of amino acids. The amino acids forming all or a part of a peptide may be naturally occurring amino acids, stereoisomers and modifications of such amino acids, non-protein amino acids, post-

translationally modified amino acids, enzymatically modified amino acids, constructs or structures designed to mimic amino acids, and the like, so that the term "peptide" includes pseudopeptides and peptidomimetics, including structures which have a non-peptidic backbone. The term "peptide" also includes dimers or multimers of peptides. A "manufactured" peptide includes a peptide produced by chemical synthesis, recombinant DNA technology, biochemical, or enzymatic fragmentation of larger molecules, combinations of the foregoing or, in general, made by any other method. The term "peptide" includes peptides containing a variable number of amino acid residues, optionally with non-amino acid residue groups at the N- and C-termini, such groups including acyl, acetyl, alkenyl, alkyl, N-alkyl, amine, or amide groups, among others.

[0144] By employing chemical synthesis, a useful means of production, it is possible to introduce various amino acids which do not naturally occur along the chain, modify the N- or C-terminus, and the like, thereby providing for improved stability and formulation, resistance to protease degradation, and the like.

[0145] "Amino acids" are molecules containing an amine group, a carboxylic acid group, and a side-chain that is specific to each amino acid. The key elements of an amino acid are carbon, hydrogen, oxygen, and nitrogen and have the generic formula H_2N—CHR—COOH, wherein R represents a side chain group. The various α-amino acids differ in the side-chain moiety that is attached to the α-carbon. The "amino acids" of the present technology include the known naturally occurring protein amino acids, which are referred to by both their common three letter abbreviation and single letter abbreviation. See generally *Synthetic Peptides: A User's Guide*, G. A. Grant, editor, W.H. Freeman & Co., New York (1992), the teachings of which are incorporated herein by reference, including the text and table set forth at pages 11 through 24. As set forth above, the term "amino acid" also includes stereoisomers and modifications of naturally occurring protein amino acids, non-protein amino acids, post-translationally modified amino acids, enzymatically synthesized amino acids, derivatized amino acids, constructs or structures designed to mimic amino acids, and the like. Modified and unusual amino acids are described generally in *Synthetic Peptides: A User's Guide*, supra; Hruby et al., *Biochem. J.* 268:249-262 (1990); and

Toniolo, *Int. J. Peptide Protein Res.* 35:287-300 (1990); the teachings of all of which are incorporated herein by reference.

[0146] The phrase "amino acid side chain moiety" used herein, including as used in the specification and claims, includes any side chain of any amino acid, as the term "amino acid" is defined herein. This thus includes the side chain moiety present in naturally occurring amino acids. It further includes side chain moieties in modified naturally occurring amino acids, such as glycosylated amino acids. It further includes side chain moieties in stereoisomers and modifications of naturally occurring protein amino acids, non-protein amino acids, post-translationally modified amino acids, enzymatically synthesized amino acids, derivatized amino acids, constructs, or structures designed to mimic amino acids, and the like. For example, the side chain moiety of any amino acid of the present technology is included within the definition. A "derivative" of an amino acid side chain moiety is included within the definition of an amino acid side chain moiety.

[0147] The "derivative" of an amino acid side chain moiety includes any modification to or variation in any amino acid side chain moieties, including a modification of naturally occurring amino acid side chain moieties. By way of example, derivatives of amino acid side chain moieties include straight chain or branched, cyclic or noncyclic, substituted or unsubstituted, saturated or unsaturated, alkyl, aryl or aralkyl moieties.

[0148] In the peptides of the present technology, conventional amino acid residues have their conventional meaning as given in Chapter 2400, of the *Manual of Patent Examining Procedure,* 8th Ed. Thus, "Ala" is alanine; "Arg" is arginine; "Asn" is asparagine; "Asp" is aspartic acid; "Cys" is cysteine; "Gln" is glutamine; "Glu" is glutamic acid; "His" is histidine; "Ile" is isoleucine; "Leu" is leucine; "Lys" is lysine; "Met" is methionine; "Phe" is phenylalanine; "Pro" is proline; "Ser" is serine; "Thr" is threonine; "Trp" is tryptophan; "Tyr" is tryosine; and "Val" is valine. Unless otherwise indicated, all amino acids abbreviations represent either isomer, i.e., the L-isomer, the D-isomer, or combinations thereof may be used. Thus, for example, "L-Phe" is L-phenylalanine; "D-Phe" is D-phenylalanine; "D-/L-Phe" is D-phenylalanine, L-phenylalanine, or combinations thereof; "Phe" is also D-phenylalanine, L-phenylalanine, or combinations thereof, and so on.

[0149] An alpha (α)-amino acid has the generic formula $H_2N—C_\alpha HR—COOH$, where R is a side chain moiety and the amino group is attached to the carbon atom immediately adjacent to the carboxylate group (i.e., the α-carbon). Other types of amino acids exist when the amino group is attached to a different carbon atom. For example, beta (β)-amino acids, the carbon atom to which the amino group is attached is separated from the carboxylate group by one carbon atom, C_β.

[0150] When β-amino acids are incorporated into peptides, two main types of β-peptides exist: those with the side chain residue, R, on the carbon next to the amine are called β^3 peptides and those with the side chain residue on the carbon next to the carbonyl group are called β^2 amino acids.

[0151] Gamma (γ)-amino acids are amino acids with the carbon atom to which the amino group attaches is separated from the carboxylate moiety by two carbon atoms.

[0152] For additional modified and unusual amino acids, see §2422 of the MPEP, particularly Table 4 at 2400-24. Additionally, "Ac" indicates N-acetyl and "cyclo" refers to a cyclic structure, which is also shown as "c." "NH_2" indicates an amine group, typically added on the C-terminus of a polypeptide. Accordingly, as used herein, an —NH_2 moiety on the C-terminus of a peptide indicates an amide, i.e., —CO—NH_2.

[0153] Additional abbreviations are used as follows: Nle is norleucine; Nal(2') is 2'-naphthylalanine; Nal(1') is 1'-naphthylalanine; Tle is tert-leucine; Nva is norvaline; Orn is ornithine; Bip is biphenylalanine; Hyp is hydroxyproline; Mamb is 3-aminomethyl-benzoic acid; Pen is Penicillamine; Tic is 1,2,3,4-tetrahydroisoquinoline-3-carboxylic Acid; Aba is 4-amino-1,2,4,5-tetra-hydro-2-benzazepin-3-one; Oic is octohydroindole-2-carboxylic acid; Atc is 2-aminotetraline-2-carboxylic acid; APC is 1-amino-4-phenylcyclohexane-carboxylic acid; APPC is 4-aminophenylpiperidine-4-carboxylic acid; Acpc is 1-aminocyclo-propane-1-carboxylic acid; Aic is 2-aminoindone-2-carboxylic acid; Ata is 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one; Aia is 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one; Che is 1-amino-1-cyclohexanecarboxylic acid Ioc is indoline-2-carboxylic acid, Aic is 2-aminoindone-2-carboxylic acid; Cpe is 1-amino-1-cyclopentane carboxylic; and p(Cl)dPhe is para-chloro-phenylalanine (I – iodo, F – fluoro, Br – bromo, CF_3 – trifluoromethyl).

[0154] The term "acyl" includes a group RCO—, where R is an organic group. An example is the acetyl group CH_3CO—, referred to herein as "Ac."

[0155] A peptide or aliphatic moiety is "acylated" when an alkyl or substituted alkyl group as defined above is bonded through one or more carbonyl {—(C=O)—} groups. A peptide is most usually acylated at the N-terminus.

[0156] An "amine" includes compounds that contain an amine group (—NH_2).

[0157] An "amide" includes compounds that have a trivalent nitrogen attached to a carbonyl group (i.e., —CO—NH_2), such as for example methylamide, ethylamide, propylamide, and the like. A peptide is most usually amidated at the C-terminus by the addition of an amine (—NH_2) moiety to the C-terminal carboxyl group.

[0158] Amino acids, including stereoisomers and modifications of naturally occurring amino acids, protein amino acids, non-protein amino acids, post-translationally modified amino acids, enzymatically synthesized amino acids, derivatized amino acids, constructs, or structures designed to mimic amino acids (peptide mimetics), and the like, including all of the foregoing, are sometimes referred to herein as "residues."

[0159] "Substantial degradation" refers to the degradation of the N-terminal extension, the C-terminal extension, both N- and C-terminal degradation or degradation to other regions of the non-naturally occurring melanocortin analog by physiological enzymes and other factors, in such a manner or to a degree that side effects appear. According to one aspect, a non-naturally occurring melanocortin analog having a C-terminal extension that resists substantial degradation is one where no more than 50% of the administered peptide causes side effects and/or displays a low half-life. In some aspects, no more than 25% of the administered peptide causes side effects and/or displays a low half-life. More preferably, in some aspects, less than 10% of the administered peptide causes side effects and/or displays a low half-life, as compared to a non-naturally occurring melanocortin analog that lacks a C-terminal extension.

[0160] The term "weight loss agent" refers to a therapeutic agent useful for the treatment or prevention of metabolic dysfunction or one or more symptoms associated with metabolic dysfunction in a subject. In some embodiments, such weight loss agents may be

effective to treat, reduce, prevent, or otherwise be useful for a subject having a disease or condition that is not metabolic dysfunction, or besides metabolic dysfunction. The present technology is expected to be useful for subjects that may receive, have received, or are receiving one or more doses of a weight loss agent regardless of the underlying disease or condition that the subject has or develops.

[0161] The disclosure of all publications, patents, and published patent applications listed herein are hereby incorporated by reference in their entireties, including but not limited to U.S. Patent Nos. 8,541,545 and 9,534,018.

Non-naturally Occurring Melanocortin Analogs

[0162] The non-naturally occurring melanocortin analogs of the present technology may comprise a non-naturally occurring melanocortin analog or a pharmaceutically acceptable salt, solvate, or stereoisomer thereof. Non-naturally occurring melanocortin analogs of the present technology may be selective for the melanocortin 4 receptor (MC4R) and/or melanocortin 3 receptor (MC3R) over other melanocortin receptors, i.e., the melanocortin 1 receptor (MC1R), the melanocortin 2 receptor (MC2R), and the melanocortin 5 receptor (MC5R). Some of the non-naturally occurring melanocortin analogs may bind only the MC3R or the MC4R. Alternatively, some of the non-naturally occurring melanocortin analogs may bind the MC3R with greater affinity than the MC4R, whereas other melanocortin analogs may bind the MC4R with greater affinity than the MC3R. Certain melanocortin analogs may bind the MC3R with the same or generally similar affinity as the MC4R.

[0163] The non-naturally occurring melanocortin analogs of the present technology may be full agonists or full antagonists for one or more melanocortin receptors. A full agonist may comprise a non-naturally occurring melanocortin analog having a maximum effect (E_{max}) agonist value of greater than or equal to 85%. Similarly, a full antagonist may comprise a non-naturally occurring melanocortin analog having an E_{max} antagonist value of greater than or equal to 85%.

[0164] The non-naturally occurring melanocortin analogs of the present technology may be partial agonists or partial antagonists A partial agonist may comprise a non-naturally

occurring melanocortin analog having a maximum effect E_{max} agonist value of less than 85%. Similarly, a partial antagonist may comprise a non-naturally occurring melanocortin analog having an E_{max} antagonist value of less than 85%.

[0165] If a non-naturally occurring melanocortin analog's E_{max} agonist value is greater than it's E_{max} antagonist value, then the non-naturally occurring melanocortin analog may be classified as an agonist (e.g., a full agonist or a partial agonist).

[0166] If a non-naturally occurring melanocortin analog's E_{max} antagonist value is greater than it's E_{max} agonist value, then the non-naturally occurring melanocortin analog may be classified as an antagonist (e.g., a full antagonist or a partial antagonist).

[0167] The non-naturally occurring melanocortin analogs of the present technology may be one or more of (i) a full MC4R antagonist and a full MC3R antagonist; (ii) a full MC4R antagonist and a partial MC3R antagonist; (iii) a full MC4R antagonist and a full MC4R agonist; (iv) a full MC4R antagonist and a partial MC3R agonist; (v) a full MC4R antagonist having no MC3R activity; (vi) a partial MC4R antagonist and a full MC3R antagonist; (vii) a partial MC4R antagonist and a partial MC3R antagonist; a partial MC4R antagonist and a full MC4R agonist; (viii) a partial MC4R antagonist and a partial MC3R agonist; (ix) a partial MC4R antagonist having no MC3R activity; (x) a partial MC4R agonist and a full MC3R antagonist; (xi) a partial MC4R agonist and a partial MC3R antagonist; (xii) a partial MC4R agonist and a partial MC3R agonist; (xiii) a partial MC4R agonist and a full MC3R agonist; and (ixx) a partial MC4R agonist having no MC3R activity.

[0168] The non-naturally occurring melanocortin analogs in accordance with the present technology may have certain structural features that impart specific properties on the analogs, such as, for example, degradation resistance, enhanced epithelial, gastrointestinal, and/or blood brain barrier transport, and binding affinity for the melanocortin 4 receptor and/or melanocortin 3 receptor. Accordingly, in some embodiments, the non-naturally occurring melanocortin analogs have one or more beta hairpin (β-hairpin) and/or beta turn (β-turn) structures. The presence of amino acids that are structurally rigid, such as, for example, Aia, Aba, Ata, Hyp, dHyp, Pro, dPro, *transPro*(guan), and *cis*Pro(guan), may lead to formation of β-hairpin and/or β-turn structures in the non-naturally occurring melanocortin analog. Additionally, D-Met and disulfide bridges (e.g., cyclization via disulfide

bond), as well as Pro-Gly and Gly-Gly linkers may induce and/or stabilize beta-turn structures of the non-naturally occurring melanocortin analogs. In general, cyclization may stabilize beta-turns, and D-amino acids may induce and/or stabilize beta-turns. Further, in some embodiments, melanocortin analogs include D-valine-D-proline (dVal-dPro) chain as their C-terminus, which may provide enhanced transport and resistance to degradation.

[0169] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence according to Formula (I),

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}R^9\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \quad (I),$$

[0170] wherein:

[0171] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0172] X^2 is absent, phenylalanine (Phe), or Nle;

[0173] X^3 is absent, Phe, or Nle;

[0174] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[0175] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[0176] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one

(Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[0177] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[0178] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[0179] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0180] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0181] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[0182] R^9 is absent or Lys;

[0183] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0184] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0185] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0186] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0187] Y^5 is absent or dVal;

[0188] Y^6 is absent or dVal;

[0189] Y^7 is absent or dPro; and

[0190] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0191] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0192] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[0193] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0194] provided that:

[0195] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[0196] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[0197] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[0198] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[0199] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[0200] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[0201] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (I), wherein:
X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0202] X^2 is absent, phenylalanine (Phe), or Nle;

[0203] X^3 is absent, Phe, or Nle;

[0204] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0205] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[0206] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[0207] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe),

para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[0208] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[0209] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0210] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0211] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[0212] R^9 is absent or Lys;

[0213] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0214] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0215] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0216] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0217] Y^5 is absent or dVal;

[0218] Y^6 is absent or dVal;

[0219] Y^7 is absent or dPro; and

[0220] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0221] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0222] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0223] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0224] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[0225] Ac-Nle-c[Asp-dTrp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 83);

[0226] Ac-Nle-c[Asp-Phe-Phe-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 420);

[0227] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 223);

[0228] Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 460);

[0229] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 464);

[0230] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 465);

[0231] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 466);

[0232] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 467);

[0233] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 468);

[0234] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 469);

[0235] Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 470);

[0236] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 474);

[0237] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 475);

[0238] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 476);

[0239] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 477);

[0240] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 478);

[0241] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 481);

[0242] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 482);

[0243] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 483);

[0244] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 484);

[0245] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 485);

[0246] Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 459);

[0247] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 472);

[0248] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 471);

[0249] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 463);

[0250] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 462);

[0251] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 479);

[0252] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 473);

[0253] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 480);

[0254] Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 486);

[0255] Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 491);

[0256] Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 461);

[0257] Ac-Nle-c[Asp-dGln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 492);

[0258] Ac-Nle-c[Asp-dTyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 496);

[0259] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 218);

[0260] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 442);

[0261] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 449);

[0262] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 455);

[0263] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 447);

[0264] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 438);

[0265] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 450);

[0266] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 435);

[0267] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 439);

[0268] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 441);

[0269] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 436);

[0270] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 454);

[0271] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 452);

[0272] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 451);

[0273] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 456);

[0274] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 437);

[0275] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 440);

[0276] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 448);

[0277] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 457);

[0278] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 453);

[0279] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 458);

[0280] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 446);

[0281] Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 433);

[0282] Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 434);

[0283] Ac-Nle-c[Asp-dPhe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 488);

[0284] Ac-Nle-c[Asp-dBip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 490);

[0285] Ac-Nle-c[Asp-dTrp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 494);

[0286] Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 443); Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 268);

[0287] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 363);

[0288] Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 365);

[0289] Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 370);

[0290] Ac-Nle-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 378);

[0291] Ac-dArg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 379);

[0292] Ac-Nle-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 380);

[0293] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 418);

[0294] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 621);

[0295] Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 666);

[0296] Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 297);

[0297] Ac-Nle-c[Asp-His-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 228);

[0298] Ac-Nle-c[Asp-His-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 229);

[0299] Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 281);

[0300] Ac-Nle-c[Asp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 355);

[0301] Ac-Nle-c[Asp-Tic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 362);

[0302] Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 424);

[0303] Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 366);

[0304] Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 368);

[0305] Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dLeu-dPro-NH_2 (SEQ ID NO: 422);

[0306] Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 372);

[0307] Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 374);

[0308] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 639);

[0309] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 352);

[0310] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 351);

[0311] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Trp-NH_2 (SEQ ID NO: 600);

[0312] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 322);

[0313] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dAsn-NH_2 (SEQ ID NO: 605);

[0314] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Gly-Gly-NH_2 (SEQ ID NO: 610);

[0315] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-NH_2 (SEQ ID NO: 581);

[0316] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 353);

[0317] Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 319);

[0318] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-dPro-NH_2 (SEQ ID NO: 607);

[0319] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 638);

[0320] Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 295);

[0321] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 575);

[0322] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 587);

[0323] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-NH_2 (SEQ ID NO: 582);

[0324] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Pro-Val-NH_2 (SEQ ID NO: 588);

[0325] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-dPro-NH_2 (SEQ ID NO: 612);

[0326] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Pro-Val-NH_2 (SEQ ID NO: 583);

[0327] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Ala-Ala-NH_2 (SEQ ID NO: 609);

[0328] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dTle-NH_2 (SEQ ID NO: 594);

[0329] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 631);

[0330] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Val-Pro-NH_2 (SEQ ID NO: 589);

[0331] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 597);

[0332] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 628);

[0333] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 591);

[0334] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 590);

[0335] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 311);

[0336] Ac-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 629);

[0337] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Hyp-NH_2 (SEQ ID NO: 574);

[0338] Ac-dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 303);

[0339] Ac-Nle-c[Asp-Oic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 360);

[0340] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 313);

[0341] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291);

[0342] Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 299);

[0343] Phe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 305);

[0344] His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 306);

[0345] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 312);

[0346] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 314);

[0347] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 315);

[0348] Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 321);

[0349] Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 423);

[0350] Ac-Nle-Phe-Phe-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 421);

[0351] Ac-Nle-c[Cys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 383);

[0352] Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 384);

[0353] Ac-Lys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 387);

[0354] Ac-Arg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 389);

[0355] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 403);

[0356] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 407);

[0357] Ac-Nle-c[Asp-Trp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 395);

[0358] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 633);

[0359] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-Pro-NH_2 (SEQ ID NO: 573);

[0360] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 643);

[0361] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-NH_2 (SEQ ID NO: 576);

[0362] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Pro-NH_2 (SEQ ID NO: 577);

[0363] dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 309);

[0364] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 593);

[0365] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 632);

[0366] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-NH_2 (SEQ ID NO: 603);

[0367] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617);

[0368] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 620);

[0369] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 634);

[0370] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 635);

[0371] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 644);

[0372] Ac-dTyr-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 304);

[0373] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 642);

[0374] dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 308);

[0375] Ac-Nle-c[Asp-Atc-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 212);

[0376] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 226);

[0377] Ac-Nle-c[dPen-Pro-dPhe-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 320);

[0378] Ac-Nle-c[Cys-dPhe-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 324);

[0379] Ac-Nle-c[Asp-Cpe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 358);

[0380] Ac-Nle-c[Asp-Che-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 359);

[0381] Ac-Nle-c[Asp-dPhe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 367);

[0382] Ac-Nle-c[Asp-dGln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 371);

[0383] Ac-Nle-c[Asp-dTrp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 373);

[0384] Ac-Nle-c[Asp-dTyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 375);

[0385] Ac-Arg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 381);

[0386] Ac-dArg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 382);

[0387] Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 385);

[0388] Ac-Ala-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 386);

[0389] Ac-dLys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 388);

[0390] Ac-dArg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 390);

[0391] Ac-dHis-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 391);

[0392] Ac-His-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 392);

[0393] Ac-Nle-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 393);

[0394] Ac-Nle-c[Asp-Trp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 394);

[0395] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 405);

[0396] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 406);

[0397] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 408);

[0398] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 409);

[0399] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 410);

[0400] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 411);

[0401] Ac-Nle-c[Asp-Phe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 412);

[0402] Ac-Nle-c[Asp-His-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 413);

[0403] Ac-Nle-c[Asp-Tyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 414);

[0404] Ac-Nle-c[Asp-dPhe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 415);

[0405] Ac-Nle-c[Asp-dHis-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 416);

[0406] Ac-Nle-c[Asp-dTyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 417);

[0407] Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 419);

[0408] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 596);

[0409] Ac-Nle-c[dAsp-Pro-dPhe-Arg-Trp-dLys]-dPro-dVal-NH_2 (SEQ ID NO: 622);

[0410] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 645);

[0411] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 646);

[0412] Ac-dLeu-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 298);

[0413] Ac-Nle-c[Asp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 354);

[0414] Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 364);

[0415] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Arg-NH_2 (SEQ ID NO: 578);

[0416] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 300);

[0417] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dArg-NH_2 (SEQ ID NO: 579);

[0418] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 580);

[0419] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 640);

[0420] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 641);

[0421] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 584);

[0422] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Val-Pro-NH_2 (SEQ ID NO: 585);

[0423] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2 (SEQ ID NO: 586);

[0424] Ac-dNle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 301);

[0425] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 595);

[0426] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 598);

[0427] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 302);

[0428] Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 630);

[0429] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2 (SEQ ID NO: 601);

[0430] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAla-dAla-NH_2 (SEQ ID NO: 602);

[0431] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dHyp-NH_2 (SEQ ID NO: 604);

[0432] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Asp-NH_2 (SEQ ID NO: 606);

[0433] Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 318);

[0434] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Hyp-NH_2 (SEQ ID NO: 608);

[0435] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-dPro-NH_2 (SEQ ID NO: 611);

[0436] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-NH_2 (SEQ ID NO: 613);

[0437] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsp-NH_2 (SEQ ID NO: 614);

[0438] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-NH_2 (SEQ ID NO: 615);

[0439] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-NH_2 (SEQ ID NO: 616);

[0440] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 599);

[0441] Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 296);

[0442] Ac-Nle-c[Asp-Aba-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 198);

[0443] Ac-Nle-c[Asp-Aia-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 207);

[0444] Ac-Nle-c[Asp-Ata-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 208);

[0445] Ac-Nle-c[Asp-Pro-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 225);

[0446] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2 (SEQ ID NO: 592);

[0447] Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 425);

[0448] Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 427);

[0449] Ac-Nle-c[Asp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 429);

[0450] Ac-Nle-c[Pen-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 325);

[0451] Ac-Nle-c[dPen-dPhe-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 326);

[0452] Ac-Nle-c[Asp-dIle-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 356);

[0453] Ac-Nle-c[Asp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 357);

[0454] Ac-Arg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 376);

[0455] Ac-dArg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 377);

[0456] Ac-Nle-c[Asp-Trp-dLeu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 396);

[0457] Ac-Nle-c[Asp-Trp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 397);

[0458] Ac-Nle-c[Asp-Trp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 398);

[0459] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 400);

[0460] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 401);

[0461] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dPhe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 402);

[0462] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 399);

[0463] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 404);

[0464] Ac-Nle-c[Asp-Pro-dPhe-Arg-dTrp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 187);

[0465] Ac-Nle-c[Asp-Pro-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 231);

[0466] Ac-Nle-c[Asp-Pro-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 232);

[0467] Ac-Nle-c[Asp-Pro-dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 233);

[0468] Ac-Nle-c[Asp-Pro-dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 234);

[0469] Ac-Nle-c[Asp-Pro-dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 235);

[0470] Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 428);

[0471] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[0472] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[0473] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[0474] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[0475] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[0476] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[0477] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[0478] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[0479] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[0480] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[0481] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[0482] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[0483] Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

[0484] Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

[0485] Ac-Nle-c[Asp-dTrp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 532);

[0486] Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 209);

[0487] Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 210);

[0488] Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 211);

[0489] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[0490] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[0491] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

[0492] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

[0493] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[0494] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[0495] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[0496] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[0497] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[0498] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

[0499] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

[0500] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

[0501] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

[0502] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[0503] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[0504] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[0505] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[0506] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[0507] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[0508] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[0509] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[0510] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[0511] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

[0512] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

[0513] Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

[0514] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

[0515] In some embodiments, R^9 is absent. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IA):

X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (IA),

[0516] wherein:

[0517] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0518] X^2 is absent, phenylalanine (Phe), or Nle;

[0519] X^3 is absent, Phe, or Nle;

[0520] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0521] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[0522] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[0523] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[0524] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[0525] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0526] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0527] R^8 is Lys or dPen;

[0528] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0529] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0530] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0531] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0532] Y^5 is absent or dVal;

[0533] Y^6 is absent or dVal;

[0534] Y^7 is absent or dPro; and

[0535] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0536] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0537] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0538] a lactam bridge between R^1 and R^7 or R^8 when R^1 is Asp and R^7 or R^8 is Lys;

[0539] provided that:

[0540] when R^4 is p(Br)dPhe, then R^1 is Nle or Ala, Y^4-Y^7 are absent, and at least one of X^1 and Y^3 is absent;

[0541] when R^4 is p(Cl)dPhe, then (i) R^3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro or (ii) R^3 is His and R^6 is not Trp;

[0542] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[0543] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^2 is not Pro.

[0544] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IA), wherein:
X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0545] X^2 is absent, phenylalanine (Phe), or Nle;

[0546] X^3 is absent, Phe, or Nle;

[0547] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt),

D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0548] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[0549] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[0550] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[0551] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[0552] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0553] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0554] R^8 is Lys or dPen;

[0555] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0556] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0557] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0558] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0559] Y^5 is absent or dVal;

[0560] Y^6 is absent or dVal;

[0561] Y^7 is absent or dPro; and

[0562] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0563] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0564] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0565] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0566] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[0567] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[0568] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[0569] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);

[0570] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);

[0571] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);

[0572] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);

[0573] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

[0574] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

[0575] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);

[0576] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

[0577] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);

[0578] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561);

[0579] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[0580] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[0581] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[0582] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[0583] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[0584] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[0585] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[0586] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[0587] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[0588] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[0589] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[0590] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[0591] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[0592] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[0593] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[0594] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[0595] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[0596] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[0597] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[0598] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[0599] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[0600] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[0601] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[0602] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[0603] Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

[0604] Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

[0605] Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 209);

[0606] Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 210);

[0607] Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 211);

[0608] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[0609] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[0610] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

[0611] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

[0612] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[0613] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[0614] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[0615] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[0616] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[0617] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

[0618] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

[0619] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

[0620] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

[0621] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[0622] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[0623] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[0624] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[0625] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[0626] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[0627] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[0628] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[0629] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[0630] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

[0631] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

[0632] Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

[0633] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

[0634] In some embodiments, the non-naturally occurring melanocortin analog is a full antagonist on the melanocortin 4 receptor and the melanocortin 3 receptor. In some embodiments, when the non-naturally occurring melanocortin analog is a full antagonist on the melanocortin 4 receptor and the melanocortin 3 receptor, then R^4 is not dPhe. In further embodiments, R^4 is selected from dNal(2'), p(Cl)dPhe, p(I)dPhe, p(Br)dPhe, and p(CF_3)dPhe. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IA), wherein:

[0635] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0636] X^2 is absent or Nle;

[0637] X^3 is absent or Nle;

[0638] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu);

[0639] R^2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, and tryptophan (Trp);

[0640] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, β-alanine (β-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip);

[0641] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[0642] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn);

[0643] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0644] R^7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0645] R^8 is Lys or dPen;

[0646] Y^1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0647] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0648] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0649] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0650] Y^5 is absent or dVal;

[0651] Y^6 is absent or dVal;

[0652] Y^7 is absent or dPro; and

[0653] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0654] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0655] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0656] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0657] provided that:

[0658] when R^4 is p(Br)dPhe, then R^1 is Nle or Ala, R^5 is Arg, Y^4-Y^7 are absent, and at least one of X^1 and Y^3 is absent;

[0659] when R^4 is p(Cl)dPhe, then R^3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro; and

[0660] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro and R^1 is not dArg, Arg, dTyr, or Ala, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys.

[0661] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IA), wherein:

[0662] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0663] X^2 is absent or Nle;

[0664] X^3 is absent or Nle;

[0665] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu);

[0666] R^2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, and tryptophan (Trp);

[0667] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip);

[0668] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[0669] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn);

[0670] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0671] R^7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0672] R^8 is Lys or dPen;

[0673] Y^1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0674] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0675] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0676] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0677] Y^5 is absent or dVal;

[0678] Y^6 is absent or dVal;

[0679] Y^7 is absent or dPro; and

[0680] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0681] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0682] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0683] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0684] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[0685] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[0686] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[0687] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[0688] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

[0689] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

[0690] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[0691] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[0692] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[0693] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[0694] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[0695] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[0696] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[0697] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[0698] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[0699] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[0700] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[0701] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[0702] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[0703] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[0704] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[0705] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[0706] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[0707] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[0708] Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

[0709] Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

[0710] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[0711] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[0712] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

[0713] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

[0714] Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 329);

[0715] Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 330);

[0716] Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 332);

[0717] Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 333);

[0718] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[0719] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[0720] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[0721] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[0722] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[0723] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

[0724] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

[0725] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

[0726] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

[0727] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[0728] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[0729] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[0730] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[0731] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[0732] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[0733] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[0734] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[0735] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[0736] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62); and

[0737] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63).

[0738] In some embodiments, R^4 is dNal(2'). In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IB):

X^1-X^2-X^3-R^1-R^2-R^3-dNal(2')-R^5-R^6-R^7-R^8-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (IB),

[0739] wherein:

[0740] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0741] X^2 is absent, phenylalanine (Phe), or Nle;

[0742] X^3 is absent, Phe, or Nle;

[0743] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0744] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[0745] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe);

[0746] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[0747] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0748] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0749] R^8 is absent or is Lys or dPen;

[0750] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0751] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0752] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0753] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0754] Y^5 is absent or dVal;

[0755] Y^6 is absent or dVal;

[0756] Y^7 is absent or dPro; and

[0757] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0758] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0759] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0760] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0761] provided that:

[0762] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is not Ala, Leu, dLeu, dVal, or Gly, and if R^3 is absent, then R^2 is Pen and R^7 is dCys; and

[0763] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[0764] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IB), wherein:

[0765] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[0766] X^2 is absent, phenylalanine (Phe), or Nle;

[0767] X^3 is absent, Phe, or Nle;

[0768] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine

(dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0769] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[0770] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe);

[0771] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[0772] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[0773] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[0774] R^8 is absent or is Lys or dPen;

[0775] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[0776] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTIe, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[0777] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[0778] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[0779] Y^5 is absent or dVal;

[0780] Y^6 is absent or dVal;

[0781] Y^7 is absent or dPro; and

[0782] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0783] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[0784] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[0785] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[0786] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[0787] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[0788] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[0789] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[0790] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[0791] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[0792] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[0793] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[0794] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[0795] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[0796] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[0797] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[0798] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[0799] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[0800] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[0801] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

[0802] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

[0803] Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

[0804] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

[0805] Alternatively, in some embodiments, R^4 is not dNal(2'). In some embodiments, R^4 is selected from p(Cl)dPhe, p(I)dPhe, p(Br)dPhe, and p(CF_3)dPhe. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IC):

$$X^1\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4 \text{ (IC)},$$

[0806] wherein:

[0807] X^1 is absent or norleucine (Nle)

[0808] R^1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys);

[0809] R^2 is aspartic acid (Asp) or cysteine (Cys);

[0810] R^3 is His or proline (Pro);

[0811] R^4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[0812] R^5 is Arg or His;

[0813] R^6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2'));

[0814] R^7 is Lys or Cys;

[0815] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[0816] Y^2 is selected from the group consisting of dVal, dPro, and dTle;

[0817] Y^3 is absent or is dVal or dPro;

[0818] Y^4 is absent or dPro; and

[0819] the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of:

[0820] a disulfide bond between Cys at R^2 and Cys R^7; and

[0821] a lactam bridge between Asp at R^2 and Lys at R^7;

[0822] provided that:

[0823] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent.

[0824] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IC), wherein:
X^1 is absent or norleucine (Nle)

[0825] R^1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys);

[0826] R^2 is aspartic acid (Asp) or cysteine (Cys);

[0827] R^3 is His or proline (Pro);

[0828] R^4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[0829] R^5 is Arg or His;

[0830] R^6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2'));

[0831] R^7 is Lys or Cys;

[0832] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[0833] Y^2 is selected from the group consisting of dVal, dPro, and dTle;

[0834] Y^3 is absent or is dVal or dPro;

[0835] Y^4 is absent or dPro; and

[0836] the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of:

[0837] a disulfide bond between Cys at R^2 and Cys R^7; and

[0838] a lactam bridge between Asp at R^2 and Lys at R^7;

[0839] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[0840] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[0841] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[0842] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[0843] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[0844] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[0845] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[0846] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[0847] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[0848] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[0849] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[0850] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[0851] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[0852] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[0853] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[0854] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511); and

[0855] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515).

[0856] Alternatively, in some embodiments, when R^4 is not dNal(2'), then R4 is selected from dPhe, p(Cl)dPhe, p(Br)dPhe, and p(F)dPhe. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (ID):

[0857] X^1-R^1-R^2-R^3-R^4-R^5-R^6-R^7-Y^1-Y^2-Y^3-Y^4 (ID),

[0858] wherein:

[0859] X^1 is absent or norleucine (Nle);

[0860] R^1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0861] R^2 is aspartic acid (Asp) or cysteine (Cys);

[0862] R^3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip);

[0863] R^4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[0864] R^5 is selected from the group consisting of Arg, Lys, and His;

[0865] R^6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2'));

[0866] R^7 is Lys or Cys;

[0867] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[0868] Y^2 is dVal or dPro;

[0869] Y^3 is absent, dVal, or dPro;

[0870] Y^4 is absent or dPro; and

[0871] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0872] a disulfide bond between Cys at R^2 and Cys at R^7; and

[0873] a lactam bridge between Asp at R^2 and Lys at R^7;

[0874] provided that:

[0875] when R^4 is p(Br)dPhe and R^1 is Nle or Ala, then the C-terminus is not dVal-dPro or dTle-dPro and if the C-terminus is dPro-dVal-dPro, then X^1 is present.

[0876] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[0877] when R^4 is dPhe, then R^3 is Pro and either R^5 is Lys or R^6 is dNal(2') or Nal(2'); and

[0878] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, and Gln, R^6 is Trp, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent.

[0879] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (ID), wherein:

[0880] X^1 is absent or norleucine (Nle);

[0881] R^1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[0882] R^2 is aspartic acid (Asp) or cysteine (Cys);

[0883] R^3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip);

[0884] R^4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[0885] R^5 is selected from the group consisting of Arg, Lys, and His;

[0886] R^6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2'));

[0887] R^7 is Lys or Cys;

[0888] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[0889] Y^2 is dVal or dPro;

[0890] Y^3 is absent, dVal, or dPro;

[0891] Y^4 is absent or dPro; and

[0892] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[0893] a disulfide bond between Cys at R^2 and Cys at R^7; and

[0894] a lactam bridge between Asp at R^2 and Lys at R^7;

[0895] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[0896] Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);

[0897] Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);

[0898] Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);

[0899] Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);

[0900] Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);

[0901] Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);

[0902] Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571);

[0903] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);

[0904] Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);

[0905] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);

[0906] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);

[0907] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[0908] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);

[0909] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);

[0910] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);

[0911] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);

[0912] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);

[0913] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);

[0914] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 223);

[0915] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 464);

[0916] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 465);

[0917] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 466);

[0918] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 467);

[0919] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 468);

[0920] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 469);

[0921] Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 470);

[0922] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 474);

[0923] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 475);

[0924] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 476);

[0925] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 477);

[0926] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 478);

[0927] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 481);

[0928] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 482);

[0929] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 483);

[0930] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 484);

[0931] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 485);

[0932] Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 459);

[0933] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 472);

[0934] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 471);

[0935] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 463);

[0936] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 462);

[0937] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 479);

[0938] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 473);

[0939] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 480);

[0940] Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 486);

[0941] Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 491);

[0942] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 218);

[0943] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 442);

[0944] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 449);

[0945] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 455);

[0946] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 447);

[0947] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 438);

[0948] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 450);

[0949] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 435);

[0950] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 439);

[0951] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 441);

[0952] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 436);

[0953] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 454);

[0954] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 452);

[0955] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 451);

[0956] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 456);

[0957] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 437);

[0958] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 440);

[0959] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 448);

[0960] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 457);

[0961] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 453);

[0962] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 458);

[0963] Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 443);

[0964] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 363);

[0965] Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 365);

[0966] Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 370);

[0967] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 621);

[0968] Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 297);

[0969] Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 366);

[0970] Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 368);

[0971] Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 372);

[0972] Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 374);

[0973] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 639);

[0974] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 638);

[0975] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 295);

[0976] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 597);

[0977] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 628);

[0978] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 591);

[0979] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 311);

[0980] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 313);

[0981] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291);

[0982] Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 299);

[0983] His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 306);

[0984] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 312);

[0985] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 314);

[0986] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 315);

[0987] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 643);

[0988] dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 309);

[0989] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617);

[0990] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 620);

[0991] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 644);

[0992] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 642);

[0993] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 596);

[0994] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 645);

[0995] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 646);

[0996] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 300);

[0997] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 640);

[0998] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 641);

[0999] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 595);

[1000] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 598);

[1001] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 302);

[1002] Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 425);

[1003] Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 318);

[1004] Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);

[1005] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[1006] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[1007] Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);

[1008] Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);

[1009] Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);

[1010] Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);

[1011] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[1012] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[1013] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[1014] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[1015] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[1016] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[1017] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[1018] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[1019] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[1020] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[1021] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[1022] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[1023] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

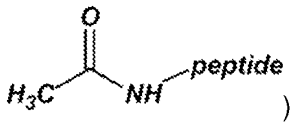
[1024] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513); and

[1025] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515).

[1026] In some embodiments, the non-naturally occurring melanocortin analog of any one of Formulae (I)-(ID) has one or more beta hairpin (β-hairpin) and/or beta turn (β-turn) structures. In some embodiments, the presence of Pro, dPro, Hyp, dHyp, dAla, dMet, Pro-Gly, Gly-Gly, *trans*Pro(guan), and/or *cis*Pro(guan), provides the β-hairpin and/or β-turn structures of the non-naturally occurring melanocortin analog. In some embodiments, the disulfide bond of the sequence according to Formula (I), if present, provides the β-hairpin and/or β-turn structures of the non-naturally occurring melanocortin analog.

[1027] As will be appreciated by the skilled artisan, non-naturally occurring melanocortin analogs comprising a sequence of any one of Formulae (I)-(ID), have an N-terminus and a C-terminus. The melanocortin analogs of the present technology are written beginning with the N-terminus at the left-most amino acid residue and ending with the C-terminus at the right most residue. Accordingly, the N-terminus of a non-naturally melanocortin analog comprising a sequence of any one of Formulae (I)-(ID) may be at any of X^1, X^2, X^3, R^1 and R^2. Analogously, the C-terminus of a non-naturally occurring

melanocortin analog comprising a sequence of any one of Formulae (I)-(ID) may be at any of R^7, R^8, R^9, Y^1, Y^2, Y^3, Y^4, Y^5, Y^6, and Y^7.

[1028] In some embodiments, the N-terminus of the non-naturally occurring melanocortin analog is modified by an acyl group. In some embodiments, the acyl group is acetyl group (e.g., 

). In some embodiments, the N-terminus of the non-naturally occurring melanocortin analog is not modified.

[1029] As discussed above, $Y^1Y^2Y^3Y^4Y^5Y^6Y^7$ represents a C-terminus of the non-naturally occurring melanocortin analog. In some embodiments, Y^1-Y^7 are absent.

[1030] In some embodiments, Y^1 is present and Y^2-Y^7 are absent. In some embodiments, Y^2-Y^7 are absent and Y^1 is selected from the group consisting of Val, Pro, Arg, dArg, Trp, Asp, dAsp, Asn, dAsn, dHyp, and Hyp.

[1031] In some embodiments, Y^1 and Y^2 are present and Y^3-Y^7 are absent. In some embodiments, Y^3-Y^7 are absent, and Y^1 is dVal and Y^2 is dPro. In some embodiments, Y^3-Y^7 are absent, and Y^1 is an amino acid other than dVal and Y^2 is an amino acid other than dPro.

[1032] In some embodiments, Y^1-Y^3 is present and Y^4-Y^7 are absent. In some embodiments, Y^1-Y^3 are each independently selected from dVal and dPro. In some embodiments, one or more of Y^1-Y^3 is an amino acid other than dVal and dPro.

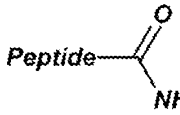
[1033] In some embodiments, Y^1-Y^4 are present, and Y^5-Y^7 are absent. In some embodiments, Y^1-Y^4 are each independently selected from dVal and dPro. In some embodiments, one or more of Y^1-Y^4 is an amino acid other than dVal and dPro.

[1034] In some embodiments, Y^1-Y^5 are present, and Y^6 and Y^7 are absent. In some embodiments, Y^1-Y^5 are each independently selected from dVal and dPro.

[1035] In some embodiments, Y^1-Y^6 are present, and Y^7 is absent. In some embodiments, Y^1-Y^6 are each independently selected from dVal and dPro.

[1036] In some embodiments, Y^1-Y^7 are present. In some embodiments, Y^1-Y^7 are each independently selected from dVal and dPro.

[1037] In some embodiments, the C-terminus of the non-naturally occurring melanocortin analog is modified by a functional group selected from the group consisting of an amide group, an ester group, and an aldehyde group.

[1038] In some embodiments, the C-terminus of the non-naturally occurring melanocortin analog is modified by an amide group (e.g., 

). In the sequence of Formula (I), a non-naturally occurring melanocortin analog with a C-terminus modified by an amide may be represented by a terminal -NH_2.

[1039] In some embodiments, the C-terminus of the non-naturally occurring melanocortin analog is not modified. In the sequence of any one of Formulae (I)-(ID), a non-naturally occurring melanocortin analog with an unmodified C-terminus may be represented by -OH or by the absence of a C-terminal group.

[1040] Melanocortin analogs in accordance with the present technology may reduce lean mass loss, maintain lean mass, or promote lean mass gain in a subject in need thereof. Additionally, the melanocortin analogs of the present technology may not induce change in plasma insulin levels in the subject, as is seen for other melanocortin analog peptides and small molecules that exhibit antagonist activity on one or more melanocortin receptors. For example, a subject may maintain stable plasma insulin levels, while maintaining or gaining lean mass, following administration of a melanocortin antagonist of the present technology.

[1041] In some embodiments, the non-naturally occurring melanocortin analog of any one of Formulae (I)-(ID) is cyclized. For example, the non-naturally occurring melanocortin analog may be cyclized through a moiety selected from the group consisting of: a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen; a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and

dOrn; and a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys.

[1042] In some embodiments, the sequence of any one of Formulae (I)-(ID) is cyclized through a lactam bond. In some embodiments, when the melanocortin analog is cyclized via a lactam bond, R^4 is dNal(2'). In further embodiments, R^1 is Nle or Asp, R^2 is Asp, Pro, or Phe, R^3 is Pro, Hyp, or His, R^5 arginine, R^6 is Trp, R^7 is Pro or Lys, and R^8 is Lys or absent. In some embodiments, the sequence of Formula (IA) is selected from the group consisting of:

[1043] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro (SEQ ID NO: 2);

[1044] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 3);

[1045] Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 4);

[1046] Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 5);

[1047] Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dLeu-dPro-NH_2 (SEQ ID NO: 6);

[1048] Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 7);

[1049] Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 9); and

[1050] Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 10),

[1051] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond.

[1052] In some embodiments, R^9 is present. In some embodiments, the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-c[Asp-Phe-Phe-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 11), wherein c represents cyclization through R^1 and R^9 via a lactam bond.

[1053] In some embodiments, R^9 is absent. In some embodiments, X^1-X^3 are present. In further embodiments, X^1 is Nle, X^2 is Phe and X^3 is Phe. In some embodiments, the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-Phe-Phe-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 12), wherein c represents cyclization through R^1 and R^8 via a lactam bond.

[1054] In some embodiments, the sequence of any one of Formulae (I)-(ID) is linear. In some embodiments, the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-Asp-Pro-dNal(2')-Arg-Trp-Lys-dVal-dPro-NH_2 (SEQ ID NO: 13). In some embodiments, the sequence of Formula (IA) is: Ac-Nle-Pro-dNal(2')-Arg-Trp-dVal-dPro-NH_2 (SEQ ID NO: 14).

[1055] In some embodiments of the sequence of any one of Formulae (I)-(ID), R^1 is Nle. Alternatively, in some embodiments, R^1 is an amino acid other than Nle. In some embodiments, R^1 is selected from dArg, dMet, dIle, dLeu, dVal, dAla, Ala, Tle, dTle, dNle, Nva, Gly, dPro, dCys, dPhe, dGln, dAsn, *trans*Pro(guan), *cis*Pro(guan), dTyr, Tyr, and Dmt. In further embodiments, R^3 is Pro, R^4 is dNal(2'), R^5 is Arg, R^6 is Trp, Y^1 is dVal, and Y^2 is dPro. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1056] Ac-dArg-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 15);

[1057] Ac-dMet-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 16);

[1058] Ac-dIle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 17);

[1059] Ac-dLeu-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 18);

[1060] Ac-dVal-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 19);

[1061] Ac-dAla-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 20);

[1062] Ac-Ala-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 21);

[1063] Ac-Tle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 22);

[1064] Ac-dTle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 23);

[1065] Ac-dNle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 24);

[1066] Ac-Nva-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 25);

[1067] Ac-Gly-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 26);

[1068] Ac-dPro-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 27);

[1069] Ac-dCys-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 28);

[1070] Ac-dPhe-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 29);

[1071] Ac-dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 30);

[1072] Ac-dGln-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 31);

[1073] Ac-dAsn-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 32);

[1074] Ac-*trans*Pro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 33);

[1075] Ac-*cis*Pro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 34);

[1076] dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 35);

[1077] Tyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 36); and

[1078] Dmt-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 37),

[1079] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[1080] In some embodiments, when the sequence of any one of Formulae (I)-(ID) is cyclized through R^2 and R^7, then R^2 is Asp and R^7 is Lys. Alternatively, in some embodiments, when the sequence of any one of Formulae (I)-(ID) is cyclized through R^2 and R^7, then R^2 is an amino acid capable of forming a linkage to the residue at R^7 other than Asp and R^7 is an amino acid capable of forming a linkage to the residue at R^2 other than Lys. For example, when R^2 is an amino acid other than Arg and R^7 is an amino acid other than Lys, the residue at R^2 may be capable of forming a linkage such as a lactam bond or a disulfide bond with the residue at R^7. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1081] Ac-Nle-c[dAsp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 38);

[1082] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dLys]-dVal-dPro-NH_2 (SEQ ID NO: 39);

[1083] Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 40);

[1084] Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 41);

[1085] Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 42);

[1086] Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 43);

[1087] Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 48);

[1088] Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 49);

[1089] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 50);

[1090] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 51);

[1091] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 52);

[1092] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 53);

[1093] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 54);

[1094] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 55);

[1095] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 59);

[1096] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 64);

[1097] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2 (SEQ ID NO: 65);

[1098] Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 66);

[1099] Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2 (SEQ ID NO: 67); and

[1100] c[CO-cis-CH = CH-CO-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 197),

[1101] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond or a disulfide bond.

[1102] In some embodiments, when the sequence of any one of Formulae (I)-(ID) is cyclized through a lactam bond between Asp at R^1 or R^2 and Lys at R^7.

[1103] In some embodiments of the sequence of any one of Formulae (I)-(ID), R^3 is Pro. Alternatively, in some embodiments, R^3 is absent or an amino acid other than Pro. In some embodiments, R^3 is absent or selected from the group consisting of Ala, dAla, dMet, Gly, Leu, Ile, Val, dLeu, dIle, dVal, Trp, *trans*Pro(guan), *cis*Pro(guan), β-Ala, Mamb, Acpc, Aba, Aia, Aic, Cpe, Che, Oic, Tic, and Glu. In further embodiments, R^1 is Nle, R^4 is dNal(2'), R^5 is Arg, R^6 is Trp, Y^1 is dVal, and Y^2 is dPro. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1104] Ac-Nle-c[Asp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 68);

[1105] Ac-Nle-c[Asp-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 69);

[1106] Ac-Nle-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 71);

[1107] Ac-Nle-c[Asp-dMet-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 72);

[1108] Ac-Nle-c[Asp-Pro-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 73);

[1109] Ac-Nle-c[Asp-Gly-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 74);

[1110] Ac-Nle-c[Asp-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 75);

[1111] Ac-Nle-c[Asp-Leu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 76);

[1112] Ac-Nle-c[Asp-Ile-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 77);

[1113] Ac-Nle-c[Asp-Val-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 78);

[1114] Ac-Nle-c[Asp-dLeu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 79);

[1115] Ac-Nle-c[Asp-dIle-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 80);

[1116] Ac-Nle-c[Asp-dVal-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 81);

[1117] Ac-Nle-c[Asp-Trp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 82);

[1118] Ac-Nle-c[Asp-*trans*Pro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 84);

[1119] Ac-Nle-c[Asp-*cis*Pro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 85),

[1120] Ac-Nle-c[Asp-β-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 199);

[1121] Ac-Nle-c[Asp-Mamb-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 200);

[1122] Ac-Nle-c[Asp-Acpc-dNal(2') Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 201);

[1123] Ac-Nle-c[Asp-Aba-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 204);

[1124] Ac-Nle-c[Asp-Aia-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 205);

[1125] Ac-Nle-c[Asp-Aic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 239);

[1126] Ac-Nle-c[Asp-Cpe-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 240);

[1127] Ac-Nle-c[Asp-Che-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 241);

[1128] Ac-Nle-c[Asp-Oic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 242);

[1129] Ac-Nle-c[Asp-Tic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 244); and

[1130] Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 255),

[1131] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond.

[1132] In some embodiments of the sequence of any one of Formulae (I)-(ID), R^5 is Arg. Alternatively, in some embodiments, R^5 is absent or an amino acid other than Arg. In some embodiments, R^5 is absent or selected from Lys, Orn, His, Ala, *trans*Pro(guan), *cis*Pro(guan), and Glu. In further embodiments, R^1 is Nle, R^3 is His or Pro, R^4 is dNal(2'), R^6 is Trp, Y^1 is dVal, and Y^2 is dPro. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1133] Ac-Nle-c[Asp-Pro-dNal(2')-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 86);

[1134] Ac-Nle-c[Asp-Pro-dNal(2')-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 87);

[1135] Ac-Nle-c[Asp-Pro-dNal(2')-Orn-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 90);

[1136] Ac-Nle-c[Asp-Pro-dNal(2')-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 92);

[1137] Ac-Nle-c[Asp-Pro-dNal(2')-Ala-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 93);

[1138] Ac-Nle-c[Asp-Pro-dNal(2')-Glu-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 96);

[1139] Ac-Nle-c[Asp-His-dNal(2')-*trans*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 247);

[1140] Ac-Nle-c[Asp-His-dNal(2')-*cis*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 248);

[1141] Ac-Nle-c[Asp-Pro-dNal(2')-*trans*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 250); and

[1142] Ac-Nle-c[Asp-Pro-dNal(2')-*cis*Pro(guan)Pro-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 251),

[1143] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[1144] In some embodiments of the sequence of any one of Formulae (I)-(ID), R^6 is Trp. Alternatively, in some embodiments, R^6 is absent or an amino acid other than Trp. In some embodiments, R^6 is selected from Nal(1'), dNal(1'), Aia, Phe, dPhe, Tyr, dTyr, dNal(2'), dTrp, Aba, and Ata. In further embodiments, R^1 is Nle, R^3 is Pro, R^4 is dNal(2'), R^5 is Arg, Y^1 is dVal, and Y^2 is dPro. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1145] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Nal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 102);

[1146] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aia-Lys]-dVal-dPro-NH2 (SEQ ID NO: 103);

[1147] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Phe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 104);

[1148] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Tyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 105);

[1149] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 108);

[1150] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dPhe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 109);

[1151] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(2']-Lys]-dVal-dPro-NH2 (SEQ ID NO: 110);

[1152] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 111);

[1153] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTrp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 196);

[1154] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 253); and

[1155] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 254),

[1156] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[1157] In some embodiments of the sequence of any one of Formulae (I)-(ID), Y^1 is dVal and Y^2 is dPro. Alternatively, in some embodiments, Y^1 is an amino acid other than dVal and Y^2 is absent or an amino acid other than dPro. In some embodiments, Y^1 is dVal and Y^2 is an amino acid other than dPro. In some embodiments, Y^1 is an amino acid other than dVal and Y^2 is dPro.

[1158] In some embodiments, Y^1 is dVal, Y^2 is dPro, and the C-terminus is modified by NH_2. In some embodiments, Y^1 is an amino acid other than dVal, Y^2 is an amino acid other than dPro, and the C-terminus is modified by NH_2. In some embodiments, Y^1 is dVal, Y^2 is an amino acid other than dPro, and the C-terminus is modified by NH_2. In some embodiments, Y^1 is an amino acid other than dVal, Y^2 is dPro, and the C-terminus is modified by NH_2. In some embodiments, Y^1 is dVal, Y^2 is dPro, and the C-terminus is unmodified.

[1159] In some embodiments of any one of Formulae (I)-(ID), when Y^1 is an amino acid other than dVal, then Y^1 is selected from dPro, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, Lys, dLys, Trp, and dTle. In some embodiments of any one of Formulae (I)-(ID) when Y^2 is absent or an amino acid other than dPro, then Y^2 is absent or selected from dVal, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, and dTle. In further embodiments, R^1 is Nle, R^3 is Pro, R^4 is dNal(2'), R^5 is Arg, and R^6 is Trp. In some embodiments, the sequence of any one of Formulae (I)-(ID), is selected from the group consisting of:

[1160] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Pro-NH_2 (SEQ ID NO: 115);

[1161] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 116);

[1162] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 117);

[1163] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Hyp-NH_2 (SEQ ID NO: 118);

[1164] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 119);

[1165] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Hyp-NH_2 (SEQ ID NO: 120);

[1166] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-dHyp-NH_2 (SEQ ID NO: 121);

[1167] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-dVal-NH_2 (SEQ ID NO: 122);

[1168] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-dVal-NH_2 (SEQ ID NO: 123);

[1169] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-Val-NH_2 (SEQ ID NO: 124);

[1170] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-Val-NH_2 (SEQ ID NO: 125);

[1171] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-NH_2 (SEQ ID NO: 126);

[1172] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-NH_2 (SEQ ID NO: 127);

[1173] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-NH_2 (SEQ ID NO: 128);

[1174] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-NH_2 (SEQ ID NO: 129);

[1175] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-NH_2 (SEQ ID NO: 130);

[1176] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Pro-NH_2 (SEQ ID NO: 131);

[1177] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-NH_2 (SEQ ID NO: 132);

[1178] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-NH_2 (SEQ ID NO: 133);

[1179] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-NH_2 (SEQ ID NO: 134);

[1180] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-NH_2 (SEQ ID NO: 135);

[1181] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-dAla-NH_2 (SEQ ID NO: 136);

[1182] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-Ala-NH_2 (SEQ ID NO: 137);

[1183] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Gly-Gly-NH_2 (SEQ ID NO: 138);

[1184] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asp-NH_2 (SEQ ID NO: 139);

[1185] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Arg-NH_2 (SEQ ID NO: 140);

[1186] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asn-NH_2 (SEQ ID NO: 141);

[1187] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsp-NH_2 (SEQ ID NO: 142);

[1188] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dArg-NH_2 (SEQ ID NO: 143);

[1189] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsn-NH_2 (SEQ ID NO: 144);

[1190] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-dPro-NH_2 (SEQ ID NO: 145);

[1191] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-NH_2 (SEQ ID NO: 146);

[1192] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-dPro-NH_2 (SEQ ID NO: 147);

[1193] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-dPro-NH_2 (SEQ ID NO: 148);

[1194] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 149);

[1195] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-dPro-NH_2 (SEQ ID NO: 150);

[1196] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-NH_2 (SEQ ID NO: 151);

[1197] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-NH_2 (SEQ ID NO: 152);

[1198] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-NH_2 (SEQ ID NO: 153);

[1199] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-NH_2 (SEQ ID NO: 154);

[1200] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-NH_2 (SEQ ID NO: 155);

[1201] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-NH_2 (SEQ ID NO: 156);

[1202] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Pro-Val-NH_2 (SEQ ID NO: 157);

[1203] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2 (SEQ ID NO: 158);

[1204] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-dVal-NH_2 (SEQ ID NO: 159);

[1205] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-NH_2 (SEQ ID NO: 160);

[1206] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 161);

[1207] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Val-Pro-NH_2 (SEQ ID NO: 162);

[1208] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2 (SEQ ID NO: 163);

[1209] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 164);

[1210] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Pro-Val-NH_2 (SEQ ID NO: 165);

[1211] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-dVal-NH_2 (SEQ ID NO: 166);

[1212] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-dVal-NH_2 (SEQ ID NO: 167);

[1213] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Val-Pro-NH_2 (SEQ ID NO: 168);

[1214] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dVal-dPro-NH_2 (SEQ ID NO: 169);

[1215] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 170);

[1216] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-dPro-NH_2 (SEQ ID NO: 171);

[1217] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 172);

[1218] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-NH_2 (SEQ ID NO: 173);

[1219] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-NH_2 (SEQ ID NO: 174);

[1220] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2 (SEQ ID NO: 175);

[1221] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 176);

[1222] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dTle-NH_2 (SEQ ID NO: 177);

[1223] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dTle-NH_2 (SEQ ID NO: 178);

[1224] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Trp-NH_2 (SEQ ID NO: 203); and

[1225] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 263),

[1226] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[1227] In some embodiments of the sequence of any one of Formulae (I)-(ID), when Y^3 is present and Y^{4-8} are absent, then each of Y^1, Y^2, and Y^3 are independently selected form dVal and dPro. In some embodiments of the sequence of any one of Formulae (I)-(ID), when Y^3 and Y^4 are present and Y^{5-8} are absent, then each of Y^1, Y^2, Y^3, and Y^4 are independently selected form dVal and dPro. In some embodiments of the sequence of any one of Formulae (I)-(ID), when Y^3-Y^5 are present and Y^{6-8} are absent, then each of Y^1-Y^5 are independently selected form dVal and dPro. In some embodiments of the sequence of any one of Formulae (I)-(ID), when Y^3-Y^6 are present and Y^{7-8} are absent, then each of Y^1-Y^6 are independently selected form dVal and dPro. In some embodiments of the sequence of any one of Formulae (I)-(ID), when Y^3-Y^7 are present and Y^8 is absent, then each of Y^1-Y^7 are independently selected form dVal and dPro. In some embodiments of the sequence of any one of Formulae (I)-(ID), when Y^3-Y^8 are present, then each of Y^1-Y^8 are independently selected form dVal and dPro. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1228] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 179);

[1229] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 180);

[1230] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 181);

[1231] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 182); and

[1232] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 183),

[1233] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[1234] In some embodiments of the sequence of any one of Formulae (I)-(ID), X^1 is present and is Nle, and R^1 is present and is Nle. In some embodiments, X^2 is present and is Nle. In some embodiments, X^3 is present and is Nle. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1235] Ac-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 184);

[1236] Ac-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 185); and

[1237] Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 186),

[1238] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[1239] In some embodiments, the sequence of any one of Formulae (I)-(ID) is cyclized through R^1 and R^7. In further embodiments, at least one of R^2 and R^3 is Pro. In some embodiments, R^2 is Pro or Trp and R^3 is selected from Pro, or Glu. In some embodiments, the sequence of any one of Formulae (I)-(ID) is cyclized through R^2 and R^8. In further embodiments, R^7 is Pro or Gly. In some embodiments, the sequence of any one of Formulae (I)-(ID) is cyclized through R^1 and R^8. In further embodiments, R^2 is Glu, R^3 is His, and R^7

is Gly. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1240] Ac-Nle-c[Asp-Pro-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 194);

[1241] Ac-Nle-c[Asp-Trp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 195);

[1242] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 257);

[1243] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 245);

[1244] Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 256);

[1245] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 259);

[1246] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 260);

[1247] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 261);

[1248] Ac-Glu-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 262);

[1249] Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 264); and

[1250] Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 265),

[1251] wherein c represents cyclization through R^1 or R^2 and R^7 or R^8 via a lactam bond

[1252] In some embodiments in sequence of any one of Formulae (I)-(ID) at least one of R^2 and R^3 is Ala or dAla. In some embodiments, R^2 is Ala or dAla and R^3 is His. In some embodiments, R^3 is Ala or dAla. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1253] Ac-Nle-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 266);

[1254] Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 267);

[1255] Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 269);

[1256] Ac-dArg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 270);

[1257] Ac-Arg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 271);

[1258] Ac-dArg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 272);

[1259] Ac-Nle-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 273);

[1260] Ac-Arg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 274);

[1261] Ac-dArg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 275);

[1262] Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-NH_2 (SEQ ID NO: 282); and

[1263] Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 283),

[1264] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond or a disulfide bond.

[1265] In some embodiments, the sequence of any one of Formulae (I)-(ID) is cyclized through R^2 and R^7 or R^8 via a disulfide bond. In further embodiments, R^2 and R^7 or R^8 are both dPen. In some embodiments, R^1 is selected from Nle, dLeu, dNle, dArg, Arg, dPhe, dTyr, Ala, dHis, His, dLys, and Lys, R^2 is dPen, R^3 is Pro, R^4 is dNal(2'), R^5 is Arg, R^6 is Trp, R^7 is Gly or Lys, and R^8 is absent or Lys. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1266] Ac-dLeu-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 327);

[1267] Ac-dNle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 328);

[1268] Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 329);

[1269] Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 330);

[1270] Ac-dPhe-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 331);

[1271] Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 332);

[1272] Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 333);

[1273] Ac-dHis-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 334);

[1274] Ac-His-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 335);

[1275] Ac-dLys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 336);

[1276] Ac-Lys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 337);

[1277] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 344);

[1278] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 345);

[1279] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dPro-NH_2 (SEQ ID NO: 346);

[1280] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dPro-NH_2 (SEQ ID NO: 347);

[1281] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dHyp-NH_2 (SEQ ID NO: 348);

[1282] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dTle-dPro-NH_2 (SEQ ID NO: 349); and

[1283] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Gly-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 350),

[1284] wherein c represents cyclization through R^2 and R^7 or R^8 via a disulfide bond.

[1285] In some embodiments of the sequence of any one of Formulae (I)-(ID), R^4 is dNal(2'). Alternatively, in some embodiments, R^4 is an amino acid other than dNal(2'). In some embodiments, when R^4 is an amino acid other than dNal(2'), then R^4 is dPhe, p(Cl)dPhe p(I)dPhe, p(Br)dPhe, p(F)dPhe, or p(CF_3)dPhe. In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1286] Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);

[1287] Ac-Nle-c[Asp-Pro-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 216);

[1288] Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);

[1289] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 219);

[1290] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[1291] Ac-Nle-c[Asp-His-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 221);

[1292] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);

[1293] Ac-Nle-c[Asp-His-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 224);

[1294] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 236);

[1295] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 237);

[1296] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 238);

[1297] Ac-Nle-c[Asp-dBip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 369);

Ac-Nle-c[Asp-Pro-dPhe-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 426);

Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 430);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 431);

[1298] Ac-Nle-c[Cys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 432);

[1299] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 444);

[1300] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 445);

[1301] Ac-Nle-c[Asp-Phe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 487);

[1302] Ac-Nle-c[Asp-Bip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 489);

[1303] Ac-Nle-c[Asp-Trp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 493);

[1304] Ac-Nle-c[Asp-Tyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 495);

[1305] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[1306] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[1307] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[1308] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[1309] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[1310] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[1311] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[1312] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[1313] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[1314] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[1315] Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);

[1316] Ac-Nle-c[Asp-dPhe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 526);

[1317] Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);

[1318] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[1319] Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);

[1320] Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);

[1321] Ac-Nle-c[Asp-dTyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 534);

[1322] Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);

[1323] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);

[1324] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[1325] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[1326] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);

[1327] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);

[1328] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);

[1329] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);

[1330] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);

[1331] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[1332] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);

[1333] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);

[1334] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 549);

[1335] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[1336] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);

[1337] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);

[1338] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);

[1339] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[1340] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);

[1341] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

[1342] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

[1343] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);

[1344] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

[1345] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);

[1346] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561);

[1347] Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);

[1348] Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);

[1349] Ac-Nle-c[Asp-dPhe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 564);

[1350] Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);

[1351] Ac-Nle-c[Asp-dBip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 566);

[1352] Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);

[1353] Ac-Nle-c[Asp-dGln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 568);

[1354] Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);

[1355] Ac-Nle-c[Asp-dTrp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 570);

[1356] Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571); and

[1357] Ac-Nle-c[Asp-dTyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 572),

[1358] wherein c represents cyclization through R^2 and R^7 via a lactam bond or a disulfide bond.

[1359] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1360] Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);

[1361] Ac-Nle-c[Asp-Pro-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 216);

[1362] Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);

[1363] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 219);

[1364] Ac-Nle-c[Asp-His-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 221);

[1365] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);

[1366] Ac-Nle-c[Asp-His-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 224);

[1367] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 236);

[1368] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 237);

[1369] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 238);

[1370] Ac-Nle-c[Asp-dBip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 369);

[1371] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[1372] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[1373] Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);

[1374] Ac-Nle-c[Asp-dPhe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 526);

[1375] Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);

[1376] Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);

[1377] Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);

[1378] Ac-Nle-c[Asp-dTyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 534);

[1379] Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);

[1380] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);

[1381] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);

[1382] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[1383] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);

[1384] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);

[1385] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 549);

[1386] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);

[1387] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);

[1388] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);

[1389] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);

[1390] Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);

[1391] Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);

[1392] Ac-Nle-c[Asp-dPhe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 564);

[1393] Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);

[1394] Ac-Nle-c[Asp-dBip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 566);

[1395] Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);

[1396] Ac-Nle-c[Asp-dGln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 568);

[1397] Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);

[1398] Ac-Nle-c[Asp-dTrp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 570);

[1399] Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571); and

[1400] Ac-Nle-c[Asp-dTyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 572),

[1401] wherein c represents cyclization through R^2 and R^7 via a lactam bond or a disulfide bond.

[1402] In some embodiments, the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[1403] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[1404] Ac-Nle-c[Asp-Pro-dPhe-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 426);

[1405] Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 430);

[1406] Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 431);

[1407] Ac-Nle-c[Cys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 432);

[1408] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 444);

[1409] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 445);

[1410] Ac-Nle-c[Asp-Phe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 487);

[1411] Ac-Nle-c[Asp-Bip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 489);

[1412] Ac-Nle-c[Asp-Trp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 493);

[1413] Ac-Nle-c[Asp-Tyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 495);

[1414] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[1415] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[1416] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[1417] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[1418] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[1419] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[1420] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[1421] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[1422] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[1423] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[1424] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[1425] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);

[1426] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);

[1427] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);

[1428] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);

[1429] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[1430] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[1431] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

[1432] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

[1433] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);

[1434] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

[1435] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);

[1436] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561),

[1437] wherein c represents cyclization through R^2 and R^7 via a lactam bond or a disulfide bond.

[1438] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (I). In some embodiments, the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IA). In some embodiments, the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55,

59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572. In some embodiments, the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IB). In some embodiments, the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IC). In some embodiments, the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561. In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence of Formula (IC). In some embodiments, the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561.

Non-Naturally Occurring Melanocortin Analog Synthesis

[1439] The non-naturally occurring melanocortin analogs of the present technology may be readily synthesized by any known conventional procedure for the formation of a peptide linkage between amino acids. Such conventional procedures include, for example, any solution phase procedure permitting a condensation between the free alpha amino group of an amino acid or residue thereof having the carboxyl group or other reactive groups protected and the free primary carboxyl group of another amino acid or residue thereof

having the amino group or other reactive groups protected. In an exemplary procedure, the peptides of the present technology may be synthesized by solid-phase synthesis and purified according to methods known in the art. Any of a number of well-known procedures utilizing a variety of resins and reagents may be used to prepare the peptides of the present technology.

[1440] The process for synthesizing the peptides may be carried out by a procedure whereby each amino acid in the desired sequence is added one at a time in succession to another amino acid or residue thereof or by a procedure whereby peptide fragments with the desired amino acid sequence are first synthesized conventionally and then condensed to provide the desired peptide. The resulting peptide is then cyclized to yield a cyclic peptide.

[1441] Solid phase peptide synthesis methods are well known and practiced in the art. In such methods, the synthesis of peptides may be carried out by sequentially incorporating the desired amino acid residues one at a time into the growing peptide chain according to the general principles of solid phase methods. These methods are disclosed in numerous references, including Merrifield, Angew Chem. 24:799-810 (1985) and Barany et al., The Peptides, Analysis, Synthesis and Biology, Vol. 2, Gross E. and Meienhofer J., Eds. Academic Press 1-284 (1980).

[1442] In chemical syntheses of peptides, reactive side chain groups of the various amino acid residues are protected with suitable protecting groups, which prevent a chemical reaction from occurring at that site until the protecting group is removed. Also common is the protection of the alpha amino group of an amino acid residue or fragment while that entity reacts at the carboxyl group, followed by the selective removal of the alpha amino protecting group to allow a subsequent reaction to take place at that site. Specific protecting for solid phase synthesis methods and solution phase synthesis methods groups are known to those having ordinary skill in the art.

[1443] Alpha amino groups may be protected by a suitable protecting group, including a urethane-type protecting group, such as benzyloxycarbonyl (Z) and substituted benzyloxycarbonyl, such as p-chlorobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-bromobenzyloxycarbonyl, p-biphenyl-isopropoxycarbonyl, 9-fluorenylmethoxycarbonyl (Fmoc) and p-methoxybenzyloxycarbonyl (Moz); aliphatic urethane-type protecting groups,

such as t-butyloxycarbonyl (Boc), diisopropylmethoxycarbonyl, isopropoxycarbonyl, and allyloxycarbonyl. Fmoc is useful for alpha amino protection.

[1444] Guanidino groups may be protected by a suitable protecting group, such as nitro, p-toluenesulfonyl (Tosyl), Z, pentamethylchromanesulfonyl (Pmc), adamantyloxycarbonyl, pentamethyldihydrobenzofuran-5-sulfonyl (Pbf) and Boc. Pmc is a useful protecting group for Arg.

[1445] Solid phase synthesis is commenced from the C-terminal end of the peptide by coupling a protected alpha amino acid to a suitable resin. Such starting material is prepared by attaching an alpha amino-protected amino acid by an ester linkage to a p-benzyloxybenzyl alcohol (Wang) resin or a 2-chlorotrityl chloride resin, by an amide bond between an Fmoc-Linker, such as p-[(R,S)-α-[1-(9H-fluor-en-9-yl)-methoxyformamido]-2,4-dimethyloxybenzyl]-phenoxyacetic acid (Rink linker) to a benzhydrylamine (BHA) resin, or by other means well known in the art. Fmoc-Linker-BHA resin supports are commercially available and generally used when feasible. The resins are carried through repetitive cycles as necessary to add amino acids sequentially. The alpha amino Fmoc protecting groups are removed under basic conditions. Piperidine, piperazine, diethylamine, or morpholine (20-40% v/v) in N,N-dimethylformamide (DMF) may be used for this purpose.

[1446] Following removal of the alpha amino protecting group, the subsequent protected amino acids are coupled stepwise in the desired order to obtain an intermediate, protected peptide-resin. The activating reagents used for coupling of the amino acids in the solid phase synthesis of the peptides are well known in the art. After the peptide is synthesized, if desired, the orthogonally protected side chain protecting groups may be removed using methods well known in the art for further derivatization of the peptide.

[1447] Reactive groups in a peptide may be selectively modified, either during solid phase synthesis or after removal from the resin. For example, peptides may be modified to obtain N-terminus modifications, such as acetylation, while on resin, or may be removed from the resin by use of a cleaving reagent and then modified. Methods for N-terminus modification, such as acetylation, and for C-terminus modification, such as amidation, are known in the art. Similarly, methods for modifying side chains of amino acids are well known to those skilled in the art of peptide synthesis. The choice of modifications made to reactive

groups present on the peptide will be determined, in part, by the characteristics that are desired in the peptide.

[1448] The peptide may be cyclized prior to cleavage from the peptide resin. For cyclization through reactive side chain moieties, the desired side chains are deprotected, and the peptide suspended in a suitable solvent and a cyclic coupling agent added. Suitable solvents include, for example DMF, dichloromethane (DCM) or 1-methyl-2-pyrrolidone (NMP). Suitable cyclic coupling reagents include, for example, 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium tetrafluoroborate (TBTU), 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU), benzotriazole-1-yl-oxy-tris(dimethylamino)phosphoniumhexafluorophosphate (BOP), benzotriazole-1-yl-oxy-tris(pyrrolidino)phosphoniumhexafluorophosphate (PyBOP), 2-(7-aza-1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium tetrafluoroborate (TATU), 2-(2-oxo-1 (2H)-pyridyl)-1,1,3,3-tetramethyluronium tetrafluoroborate (TPTU) or N,N′-dicyclohexylcarbodiimide/1-hydroxybenzotriazole (DCCI/HOBt). Coupling is convention initiated by use of a suitable base, such as N,N-diispropylethylamine (DIPEA), sym-collidine or N-methylmorpholine (NMM).

[1449] Following cleavage of peptides from the solid phase following their synthesis, the peptide may be purified by any number of methods, such as reverse phase high performance liquid chromatography (RP-HPLC), using a suitable column, such as a C18 column. Other methods of separation or purification, such as methods based on the size or charge of the peptide, may also be employed. Once purified, the peptide may be characterized by any number of methods, such as high-performance liquid chromatograph (HPLC), amino acid analysis, mass spectrometry, and the like.

Salt Forms of Non-Naturally Occurring Melanocortin Analogs

[1450] The non-naturally occurring melanocortin analog peptides of the present technology may be in the form of any salt. The term “pharmaceutically acceptable salts” refers to salts prepared from non-toxic bases or acids including inorganic or organic bases and inorganic or organic acids. Salts derived from inorganic bases include aluminum, ammonium, calcium, copper, ferric, ferrous, lithium, magnesium, manganic salts,

manganous, potassium, sodium, zinc, and the like. Exemplary salts are the ammonium, calcium, lithium, magnesium, potassium, and sodium salts. Salts derived from organic non-toxic bases include salts of primary, secondary, and tertiary amines, substituted amines including naturally occurring substituted amines, cyclic amines, and basic ion exchange resins, such as arginine, betaine, caffeine, choline, N,N′-dibenzylethylenediamine, diethylamine, 2-diethylaminoethanol, 2-dimethylaminoethanol, ethanolamine, ethylenediamine, N-ethyl-morpholine, N-ethylpiperidine, glucamine, glucosamine, histidine, hydrabamine, isopropylamine, lysine, methylglucamine, morpholine, piperazine, piperidine, polyamine resins, procaine, purines, theobromine, triethylamine, trimethylamine, tripropylamine, tromethamine, and the like.

[1451] When the peptides of the present technology are basic, acid addition salts may be prepared from non-toxic acids, including inorganic and organic acids. Such acids include acetic, benzenesulfonic, benzoic, camphorsulfonic, carboxylic, citric, ethanesulfonic, formic, fumaric, gluconic, glutamic, hydrobromic, hydrochloric, isethionic, lactic, maleic, malic, mandelic, methanesulfonic, malonic, mucic, nitric, pamoic, pantothenic, phosphoric, propionic, succinic, sulfuric, tartaric, p-toluenesulfonic acid, trifluoroacetic acid, and the like. Acid addition salts of the peptides of the present technology are prepared in a suitable solvent from the peptide and an excess of an acid, such as hydrochloric, hydrobromic, sulfuric, phosphoric, acetic, trifluoroacetic, citric, tartaric, maleic, succinic or methanesulfonic acid. The acetate salt form is especially useful. Where the peptides of the present technology include an acidic moiety, suitable salts may include alkali metal salts, such as sodium or potassium salts, or alkaline earth metal salts, such as calcium or magnesium salts.

Weight Loss Agents

[1452] The non-naturally occurring melanocortin analogs of the present technology may be administered before or after administration of a weight loss agent (e.g., a glucagon-like peptide-1 receptor agonist). In some embodiments, the non-naturally occurring melanocortin analogs are administered simultaneously to a weight loss agent. The non-naturally occurring melanocortin analog may be used to offset weight loss or reduce, prevent, or otherwise reverse lean mass loss attributed to use of the weight loss agent. The

present technology is expected to be useful for subjects that may receive, have received, or are receiving one or more doses of a weight loss agent regardless of the underlying disease or condition that the subject has or develops.

Pharmaceutical Compositions, Formulations, and Administration

[1453] The non-naturally occurring melanocortin analogs of the present technology may be present in a pharmaceutical composition.

[1454] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of 0.1 mg/mL to 50 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of 0.1 mg/mL to 50 mg/mL, 0.5 mg/mL to 40 mg/mL, 1 mg/mL to 30 mg/mL, 2.5 mg/mL to 20 mg/mL, 5 mg/mL to 15 mg/mL, or 5 mg/mL to 10 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of 10 mg/mL, relative to a total volume of the pharmaceutical composition.

[1455] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of about 0.1 mg/mL to about 50 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of about 0.1 mg/mL to about 50 mg/mL, about 0.5 mg/mL to about 40 mg/mL, about 1 mg/mL to about 30 mg/mL, about 2.5 mg/mL to about 20 mg/mL, about 5 mg/mL to about 15 mg/mL, or about 5 mg/mL to about 10 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of about 10 mg/mL, relative to a total volume of the pharmaceutical composition.

[1456] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of at least 0.1 mg/mL to at least 50 mg/mL, relative to a total volume of the pharmaceutical composition. In some

embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of at least 0.1 mg/mL to at least 50 mg/mL, at least 0.5 mg/mL to at least 40 mg/mL, at least 1 mg/mL to at least 30 mg/mL, at least 2.5 mg/mL to at least 20 mg/mL, at least 5 mg/mL to at least 15 mg/mL, or at least 5 mg/mL to at least 10 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of at least 10 mg/mL, relative to a total volume of the pharmaceutical composition.

[1457] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of at least about 0.1 mg/mL to at least about 50 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of at least about 0.1 mg/mL to at least about 50 mg/mL, at least about 0.5 mg/mL to at least about 40 mg/mL, at least about 1 mg/mL to at least about 30 mg/mL, at least about 2.5 mg/mL to at least about 20 mg/mL, at least about 5 mg/mL to at least about 15 mg/mL, or at least about 5 mg/mL to at least about 10 mg/mL, relative to a total volume of the pharmaceutical composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of at least about 10 mg/mL, relative to a total volume of the pharmaceutical composition.

Formulations

[1458] The pharmaceutical composition comprising the non-naturally occurring melanocortin analog may be formulated for intraperitoneal, intravenous, parenteral, depot, subcutaneous, intramuscular, intracerebroventricular, intranasal, or oral administration. In some embodiments, the pharmaceutical composition comprising the non-naturally occurring melanocortin analog is formulated for subcutaneous administration. In some embodiments, the pharmaceutical composition comprising the non-naturally occurring melanocortin analog is formulated for oral administration. In some embodiments, the pharmaceutical composition comprising the non-naturally occurring melanocortin analog is formulated for depot administration.

[1459] In some embodiments, the pharmaceutical composition further comprises a pharmaceutical salt. Any pharmaceutical salt known in the art may be included in the pharmaceutical composition.

[1460] Pharmaceutical compositions comprising the non-naturally occurring melanocortin analog may be administered using any means known in the art, including orally, rectally, vaginally, ocularly, intranasally, topically, parenterally, or by injection. If administered by injection, the injection may be intravenous (IV), subcutaneous (SC), intramuscular (IM), intraperitoneal (IP), intracerebroventricular (ICV), or other means known in the art. Compositions administered by injection may be formulated for depot injection. Pharmaceutical compositions may be formulated by any means known in the art, including but not limited to formulation as tablets, capsules, caplets, suspensions, powders, lyophilized preparations, suppositories, pessaries, ocular drops, skin patches, orally soluble formulations, enteric formulations, solutions sprays, aerosols and the like, and may be mixed and formulated with buffers, binders, excipients, stabilizers, lubricants, oils, adjuvants, antioxidants and other agents known in the art. In general, any route of administration by which the compositions are introduced across an epidermal layer of cells may be employed. Administration includes topical delivery. Administration includes delivery across the epithelium. Administration includes delivery through the gastrointestinal tract. Administration includes delivery across the blood brain barrier. Administration includes delivery through mucous membranes, buccal administration, ophthalmic administration, oral administration, dermal administration, inhalation administration, nasal administration, urethral administration, vaginal administration, rectal administration, and the like.

[1461] In order to facilitate delivery of the active ingredients, to enhance dispersion, solubility, and stability of the active ingredients, and/or to reduce adverse injection site reactions, the pharmaceutical composition may further comprise one or more pharmaceutically acceptable carriers and/or excipients.

[1462] The pharmaceutical composition may comprise one or more pharmaceutically acceptable carriers and/or excipients such as, for example, buffers, binders, excipients, stabilizers, lubricants, oils, adjuvants, and antioxidants. For example, when the first

pharmaceutical composition is formulated for subcutaneous administration, the one or more pharmaceutically acceptable carriers and/or excipients may comprise water.

[1463] In some embodiments, the first pharmaceutical composition contains 0.1 to 99.9999 wt.%, 1 to 99.999 wt.%, 5 to 99.99 wt.%, 10 to 99.9 wt.%, 15 to 99 wt.%, 20 to 90 wt.%, 30 to 85 wt.%, 40 to 80 wt.%, 50 to 75 wt.%, or 60 to 70 wt.% of the one or more pharmaceutically acceptable carriers and/or excipients relative to a total weight of the first pharmaceutical composition.

[1464] In some embodiments, the first pharmaceutical composition contains 0.1 to 99.9999 wt.%, 1 to 99.999 wt.%, 5 to 99.99 wt.%, 10 to 99.9 wt.%, 15 to 99 wt.%, 20 to 90 wt.%, 30 to 85 wt.%, 40 to 80 wt.%, 50 to 75 wt.%, or 60 to 70 wt.% of the one or more pharmaceutically acceptable carriers and/or excipients relative to a total weight of the first pharmaceutical composition.

[1465] In some embodiments, the first pharmaceutical composition contains at least 0.1 to at least 99.9999 wt.%, at least 1 to at least 99.999 wt.%, at least 5 to at least 99.99 wt.%, at least 10 to at least 99.9 wt.%, at least 15 to at least 99 wt.%, at least 20 to at least 90 wt.%, at least 30 to at least 85 wt.%, at least 40 to at least 80 wt.%, at least 50 to at least 75 wt.%, or at least 60 to at least 70 wt.% of the one or more pharmaceutically acceptable carriers and/or excipients relative to a total weight of the first pharmaceutical composition.

[1466] In some embodiments, the first pharmaceutical composition contains at least about 0.1 to at least about 99.9999 wt.%, at least about 1 to at least about 99.999 wt.%, at least about 5 to at least about 99.99 wt.%, at least about 10 to at least about 99.9 wt.%, at least about 15 to at least about 99 wt.%, at least about 20 to at least about 90 wt.%, at least about 30 to at least about 85 wt.%, at least about 40 to at least about 80 wt.%, at least about 50 to at least about 75 wt.%, or at least about 60 to at least about 70 wt.% of the one or more pharmaceutically acceptable carriers and/or excipients relative to a total weight of the first pharmaceutical composition.

[1467] Any pharmaceutically acceptable carriers and/or excipients known in the art may be included in the pharmaceutical composition. Non-limiting examples of pharmaceutically acceptable carriers and/or excipients include buffers, binders, excipients,

stabilizers, lubricants, oils, adjuvants, preservatives, lipids, and antioxidants. The pharmaceutical composition may comprise any combination of the one or more pharmaceutically acceptable carriers and/or excipients previously described in relation to the first and pharmaceutical compositions. In some embodiments, the one or more pharmaceutically acceptable carriers and/or excipients comprise water.

[1468] To facilitate delivery of the non-naturally occurring melanocortin analog, the pharmaceutical composition may comprise one or more pharmaceutically acceptable carriers and/or excipients. Other pharmaceutically acceptable carriers and/or excipients may be included in the pharmaceutical composition to enhance dispersion, solubility, and stability of the non-naturally occurring melanocortin analog, and to reduce adverse injection site reactions.

[1469] In some embodiments, the one or more pharmaceutically acceptable carriers and/or excipients are isotonic.

[1470] In some embodiments, the salt is present in the pharmaceutical composition in a concentration of about 0.1 mg/mL to about 50 mg/mL, about 1 mg/mL to about 25 mg/mL, or about 5 mg/mL to about 10 mg/mL, relative to a total volume of the composition.

[1471] In some embodiments, the salt is present in the pharmaceutical composition in a concentration of at least 0.1 mg/mL to at least 50 mg/mL, at least 1 mg/mL to at least 25 mg/mL, or at least 5 mg/mL to at least 10 mg/mL, relative to a total volume of the composition

[1472] In order to achieve a desirable tonicity, the pharmaceutical composition may further include a salt such as sodium chloride, sodium succinate, sodium sulfate, potassium chloride, magnesium chloride, magnesium sulfate, and calcium chloride.

[1473] In some embodiments, the salt is present in the pharmaceutical composition in a concentration of at least about 0.1 mg/mL to at least about 50 mg/mL, at least about 1 mg/mL to at least about 25 mg/mL, or at least about 5 mg/mL to at least about 10 mg/mL, relative to a total volume of the composition.

[1474] Pharmaceutically acceptable carriers and/or excipients that may be included in the pharmaceutical composition generally include a pH buffered aqueous solution comprising one or more of the following components: (a) sodium acetate, (b) Tris, and (c)

water. In some embodiments, all components are compatible with the non-naturally occurring melanocortin analog (i.e., do not react or cause the non-naturally occurring melanocortin analog to react) and are homogeneously dispersed or dissolved uniformly in the composition.

[1475] In the pH buffered solution of the pharmaceutical composition, the water may act as a diluent and include, without limitation, water for injection (WFI), sterile water, bacteriostatic water for injection (BWFI), distilled water, bidistilled water, deionized water, deionized distilled water, and reverse osmosis water. In some embodiments, the water present in the pH buffered aqueous solution is water for injection.

[1476] In some embodiments, the pharmaceutical composition includes water in an amount of about 1 wt% to about 90 wt%, about 10 wt% to about 75 wt%, or about 25 wt% to about 50 wt%, relative to a total weight of the composition.

[1477] In some embodiments, the pharmaceutical composition includes water in an amount of at least 1 wt% to at least 90 wt%, at least 10 wt% to at least 75 wt%, or at least 25 wt% to at least 50 wt%, relative to a total weight of the composition.

[1478] In some embodiments, the pharmaceutical composition includes water in an amount of at least about 1 wt% to at least about 90 wt%, at least about 10 wt% to at least about 75 wt%, or at least about 25 wt% to at least about 50 wt%, relative to a total weight of the composition. In some embodiments, sodium acetate is present in the pharmaceutical composition in a concentration of 0.5 mg/mL to 50 mg/mL, relative to a total volume of the composition. For example, sodium acetate may be present in the pharmaceutical composition in a concentration of 0.5 mg/mL to 50 mg/mL, 1 mg/mL to 40 mg/mL, 2 mg/mL to 30 mg/mL, 4 mg/mL to 20 mg/mL, 5 mg/mL to 15 mg/mL, 6 mg/mL to 12 mg/mL, or 8 mg/mL to 10 mg/mL, relative to a total volume of the composition.

[1479] In some embodiments, sodium acetate is present in the pharmaceutical composition in a concentration of about 6 mg/mL to about 8 mg/mL, relative to a total volume of the composition. For example, sodium acetate may be present in the pharmaceutical composition in a concentration of 6 mg/mL, 6.5 mg/mL, 7 mg/mL, 7.1 mg/mL, 7.5 mg/mL, or 8 mg/mL, relative to a total volume of the composition.

[1480] In some embodiments, sodium acetate is present in the pharmaceutical composition in a molar concentration of 5 mM to 700 mM, relative to a total volume of the composition. For example, sodium acetate may be present in the pharmaceutical composition in a molar concentration of 5 mM to 700 mM, 10 mM to 600 mM, 20 mM to 500 mM, 30 mM to 400 mM, 40 mM to 300 mM, 50 mM to 200 mM, 60 mM to 100 mM, or 70 mM to 80 mM, relative to a total volume of the composition.

[1481] In some embodiments, sodium acetate is present in the pharmaceutical composition in a molar concentration of about 80 mM to about 100 mM, relative to a total volume of the composition. For example, sodium acetate may be present in the pharmaceutical composition in a molar concentration of 80 mM, 85 mM, 87 mM, 90 mM, 95 mM, or 100 mM, relative to a total volume of the composition.

[1482] The term "Tris" refers to tris(hydroxymethyl)aminomethane, which is also known as Tris buffer, Tris base, TRIS, tromethamine, tromethamine buffer, Trizma®, Trisamine, Trometamol, Tromethane, Trisaminol, or THAM. In some embodiments, Tris is present in the pharmaceutical composition in a concentration of 0.5 mg/mL to 50 mg/mL, relative to a total volume of the composition. For example, Tris may be present in the pharmaceutical composition in a concentration of 0.5 mg/mL to 50 mg/mL, 1 mg/mL to 40 mg/mL, 2 mg/mL to 30 mg/mL, 4 mg/mL to 20 mg/mL, 5 mg/mL to 15 mg/mL, 6 mg/mL to 12 mg/mL, or 8 mg/mL to 10 mg/mL, relative to a total volume of the composition.

[1483] In some embodiments, Tris is present in the pharmaceutical composition in a concentration of about 6 mg/mL to about 8 mg/mL, relative to a total volume of the composition. For example, Tris may be present in the pharmaceutical composition in a concentration of 6 mg/mL, 6.5 mg/mL, 7 mg/mL, 7.3 mg/mL, 7.6 mg/mL, or 8 mg/mL, relative to a total volume of the composition.

[1484] In some embodiments, Tris is present in the pharmaceutical composition in a molar concentration of 2 mM to 500 mM, relative to a total volume of the composition. For example, Tris may be present in the pharmaceutical composition in a molar concentration of 2 mM to 500 mM, 5 mM to 400 mM, 10 mM to 300 mM, 20 mM to 200 mM, 30 mM to 150 mM, 40 mM to 100 mM, 50 mM to 80 mM, or 60 mM to 70 mM, relative to a total volume of the composition.

[1485] In some embodiments, Tris is present in the pharmaceutical composition in a molar concentration of about 50 mM to about 70 mM, relative to a total volume of the composition. For example, Tris may be present in the pharmaceutical composition in a molar concentration of 50 mM, 55 mM, 60 mM, 65 mM, or 70 mM, relative to a total volume of the composition.

[1486] In some embodiments, the pH buffered aqueous solution provides the pharmaceutical composition with a pH equivalent or close to the physiological pH levels. This may reduce adverse injection site reactions and also provide the non-naturally occurring melanocortin analog with enhanced stability and resistance to aggregation and degradation.

[1487] In some embodiments, a weight ratio of sodium acetate to Tris is about 1:4 to about 4:1, about 2:7 to about 7:2, about 1:3 to about 3:1, about 2:5 to about 5:2, about 1:2 to about 2:1, about 2:3 to about 3:2, or about 1:1. In some embodiments, the weight ratio of sodium acetate to Tris is about 1:1.

[1488] In some embodiments, a weight ratio of the non-naturally occurring melanocortin analog to sodium acetate is about 1:1 to about 20:1, about 3:2 to about 15:1, about 2:1 to about 12:1, about 3:1 to about 10:1, about 4:1 to about 9:1, about 5:1 to about 8:1, or about 6:1 to about 7:1. In some embodiments, the weight ratio of the non-naturally occurring melanocortin analog to sodium acetate is about 7:1.

[1489] In some embodiments, a weight ratio of the non-naturally occurring melanocortin analog to Tris is about 1:1 to about 20:1, about 3:2 to about 15:1, about 2:1 to about 12:1, about 3:1 to about 10:1, about 4:1 to about 9:1, about 5:1 to about 8:1, or about 6:1 to about 7:1. In some embodiments, the weight ratio of the non-naturally occurring melanocortin analog to Tris is about 7:1.

[1490] In addition to sodium acetate and Tris, the pharmaceutical composition may include other buffering agents. Non-limiting examples of additional buffering agents include saline, phosphate, phosphoric acid, citrate, succinate, gluconate, histidine, acetic acid, ascorbate, tartartic acid, maleic acid, glycine, lactate, lactic acid, ascorbic acid, imidazole, bicarbonate, carbonic acid, succinic acid, sodium benzoate, benzoic acid, gluconate,

edetate, malate, imidazole, and mixtures thereof. In some embodiments, the pharmaceutical composition comprises acetic acid as an additional buffering agent.

[1491] The pharmaceutical composition may further comprise one or more chelating agents. Suitable chelating agents include, but are not limited to edetate disodium dihydrate, calcium disodium edetate, sodium edetate, calcium versetamide sodium, calteridol, and diethylenetriaminepentaacetic acid. In some embodiments, the pharmaceutical composition further comprises edetate disodium dihydrate.

[1492] The pharmaceutical composition may further comprise a preservative agent. Exemplary preservative agents include, but are not limited to, ascorbic acid, cysteine hydrochloride, sodium bisulfate, sodium metabisulfite, sodium sulfite, ascorbyl palmitate, butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), lecithin, propyl gallate, phenol, m-cresol, benzyl alcohol, alpha-tocopherol, citric acid, ethylenediamine tetraacetic acid (EDTA), sorbitol, tartaric acid, phosphoric acid, benzalkonium chloride, phenoxyethanol, and methyl paraben. In some embodiments, when the pharmaceutical composition comprises a preservative agent, the preservative agent is phenol, benzyl alcohol, or a combination thereof.

[1493] If present in the pharmaceutical composition, the concentration of the preservative agent may range from 0.001 mg/mL to 50 mg/mL, 0.01 mg/mL to 25 mg/mL, 0.1 mg/mL to 10 mg/mL, or 1 mg/mL to 5 mg/mL, relative to a total volume of the composition.

[1494] The pharmaceutical composition may further comprise an emulsifier. Non-limiting examples of emulsifiers that may be included in the pharmaceutical composition include sodium carboxymethylcellulose, cetyl alcohol, glycerol monostearate, methylcellulose, and stearic acid. In some embodiments, when the pharmaceutical composition comprises an emulsifier, the emulsifier is sodium carboxymethylcellulose.

[1495] The pharmaceutical composition may further comprise a lipid. Lipids may enhance solubility and/or improve permeability of the non-naturally occurring melanocortin analog. In some embodiments, the lipid is a phospholipid. Non-limiting examples of phospholipids that may be included in the pharmaceutical composition include egg

phosphatidylcholine, hydrogenated soybean phoshphaditylcholine, glycerophosphocholine, lecithin, and N-(carbonyl-methoxypolyethylene glycol 2000)-1,2-distearoyl-glycero-3-phosphoethanolamine sodium salt. In some embodiments, when the pharmaceutical composition comprises a lipid, the lipid is N-(carbonyl-methoxypolyethylene glycol 2000)-1,2-distearoyl-glycero-3-phosphoethanolamine sodium salt.

[1496] The pharmaceutical composition may further comprise a bulking agent. Inclusion of a bulking agent may increase the stability of the pharmaceutical composition. Non-limiting examples of bulking agents that may be included in the pharmaceutical composition include sucrose, lactose, trehalose, mannitol, sorbitol, glucose, raffinose, glycine, histidine, and polyvinyl pyrrolidone. In some embodiments, when the pharmaceutical composition comprises a bulking agent, the bulking agent is mannitol.

[1497] In some embodiments, the pharmaceutical composition is in the form of an aqueous solution or a suspension. In some embodiments, the pharmaceutical composition is in the form of an emulsion. In some embodiments, the pharmaceutical composition is in the form of an aqueous solution. In some embodiments, the pharmaceutical composition is in the form of an aqueous solution which is clear, colorless, and/or free of visible foreign matter.

[1498] In some embodiments, the pharmaceutical composition has a pH ranging from about 6.5 to about 8.5. In some embodiments, the pharmaceutical composition has a pH of about 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, or 8.5.

[1499] In some embodiments, the pharmaceutical composition is basic and has a pH of about 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, or 8.5. In some embodiments, the pharmaceutical composition has a pH ranging from about 7.3 to about 7.4. In some embodiments, the pharmaceutical composition has a pH of 7.3 or 7.4.

[1500] In some embodiments, the pharmaceutical composition has an osmolality ranging from 250 mOsm/kg to 350 mOsm/kg. For example, the pharmaceutical composition may have an osmolality ranging from 250 mOsm/kg to 360 mOsm/kg, 260 mOsm/kg to 340 mOsm/kg, 270 mOsm/kg to 330 mOsm/kg, 280 mOsm/kg to 320 mOsm/kg, 290 mOsm/kg

to 310 mOsm/kg, or about 300 mOsm/kg. In some embodiments, the pharmaceutical composition has an osmolarity of about 250 mOsm/kg, about 260 mOsm/kg, about 270 mOsm/kg, about 280 mOsm/kg, about 290 mOsm/kg, about 300 mOsm/kg, about 310 mOsm/kg, about 320 mOsm/kg, about 330 mOsm/kg, about 340 mOsm/kg, about 350 mOsm/kg, or about 360 mOsm/kg. In some embodiments, the pharmaceutical composition has an osmolality ranging from about 275 mOsm/kg to about 330 mOsm/kg. In some embodiments, the pharmaceutical composition has an osmolality of about 279 mOsm/kg, about 314 mOsm/kg, or about 329 mOsm/kg.

[1501] In some embodiments, the pharmaceutical composition has a viscosity ranging from about 0.5 cP to about 5 cP. For example, the pharmaceutical composition may have a viscosity ranging from about 0.5 cP to about 5 cP, about 0.75 cP to about 4.5 cP, about 1.0 cP to about 4 cP, about 1.2 cP to about 3.5 cP, about 1.3 cP to about 3 cP, about 1.4 cP to about 2.5 cP, about 1.5 cP to about 2 cP, or about 1.6 cP to about 1.8 cP. In some embodiments, the pharmaceutical composition has a viscosity of about 0.5 cP, 0.6 cP, 0.7 cP, 0.8 cP, 0.9 cP, 1.0 cP, 1.1 cP, 1.2 cP, 1.3 cP, 1.4 cP, 1.5 cP, 1.6 cP, 1.7 cP, 1.8 cP, 1.9 cP, or 2.0 cP. In some embodiments, the pharmaceutical composition has a viscosity of about 1.4 cP or about 1.6 cP.

[1502] In some embodiments, the pharmaceutical composition disclosed is formulated for parenteral administration, such as, for example, in the form of aqueous or non-aqueous isotonic sterile injection solutions or suspensions. The term “parenteral,” as used herein, includes subcutaneous, intravenous, intraperitoneal, intramuscular, and intralesional, or infusion techniques.

[1503] When the pharmaceutical composition is formulated for parenteral administration (e.g., subcutaneous administration), the active ingredient(s) (e.g., the non-naturally occurring melanocortin analog) may be dissolved or suspended in the aforementioned carrier and/or excipient. Additional aqueous or non-aqueous carriers that may facilitate dissolution of the active ingredient include, but are not limited to, ethanol, benzyl alcohol, DMSO, polyethylene glycol, propylene glycol, corn oil, cottonseed oil, peanut oil, sesame oil, and/or various buffers.

[1504] In some embodiments, the pharmaceutical composition is formulated for parenteral administration (e.g., subcutaneous administration) and comprises a non-naturally occurring melanocortin analog in a concentration of about 0.001 nmol, 0.005 nmol, 0.01 nmol, 0.02 nmol, 0.05 nmol, 0.1 nmol, 0.25 nmol, 0.5 nmol, 1 nmol, 2.5 nmol, 5 nmol, 10 nmol, 20 nmol, 25 nmol, 50 nmol, 100 nmol, 250 nmol, 500 nmol, or 1000 nmol, or even more, depending on the specific peptide selected, the desired therapeutic response, the route of administration, the formulation and other factors known to those of skill in the art.

[1505] In some embodiments, the pharmaceutical composition is formulated for parenteral administration (e.g., subcutaneous administration) and comprises sodium acetate in a concentration of about 5 mM, 10 mM, 15 mM, 20 mM, 25 mM, 30 mM, 35 mM, 40 mM, 45 mM, 50 mM, 55 mM, 60 mM, 65 mM, 70 mM, 75 mM, 76 mM, 77 mM, 78 mM, 79 mM, 80 mM, 81 mM, 82 mM, 83 mM, 84 mM, 85 mM, 86 mM, 87 mM, 88 mM, 89 mM, 90 mM, 91 mM, 92 mM, 93 mM, 94 mM, 95 mM, 96 mM, 97 mM, 98 mM, 99 mM, 100 mM, 105 mM, 110 mM, 120 mM, 130 mM, 140 mM, 150 mM, 160 mM, 170 mM, 180 mM, 190 mM, or 200 mM.

[1506] In some embodiments, the pharmaceutical composition is formulated for parenteral administration (e.g., subcutaneous administration) and comprises Tris in a concentration of about 5 mM, 10 mM, 15 mM, 20 mM, 25 mM, 30 mM, 3 5mM, 40 mM, 45 mM, 50 mM, 55 mM, 60 mM, 65 mM, 70 mM, 75 mM, 80 mM, 85 mM, 90 mM, 95 mM, 100 mM, 105 mM, 110 mM, or 120 mM.

[1507] Alternatively, in some embodiments, the pharmaceutical composition is formulated for intranasal administration. When the pharmaceutical composition is formulated for intranasal administration, the composition may comprise one or more pharmaceutically acceptable carriers and/or excipients to facilitate delivery and enhance dispersion, solubility, and stability of the non-naturally occurring melanocortin analog.

[1508] The pharmaceutical composition may be formulated to be delivered by nose drop, spray device, or topical solution. In some embodiments, the pharmaceutical composition may be formulated as an aerosol, atomizer, inhalation, insufflation, metered-dose inhaler, or nebulizer. In some embodiments, the composition includes a propellant, such as hydrofluoroalkane.

[1509] When the pharmaceutical composition is formulated for intranasal administration, the active ingredient(s) (e.g., the non-naturally occurring melanocortin analog) may be dissolved or suspended in the one or more pharmaceutically acceptable carriers and/or excipients. Additional aqueous or non-aqueous carriers that may facilitate dissolution of the active ingredient include, but are not limited to, ethanol, benzyl alcohol, DMSO, polyethylene glycol, propylene glycol, corn oil, cottonseed oil, peanut oil, sesame oil, and/or various buffers.

[1510] In some embodiments, the pharmaceutical composition is formulated for intranasal administration and comprises the non-naturally occurring melanocortin analog in a concentration of about 0.001 nmol, 0.005 nmol, 0.01 nmol, 0.02 nmol, 0.05 nmol, 0.1 nmol, 0.25 nmol, 0.5 nmol, 1 nmol, 2.5 nmol, 5 nmol, 10 nmol, 20 nmol, 25 nmol, 50 nmol, 100 nmol, 250 nmol, 500 nmol, or 1000 nmol, or even more, depending on the specific peptide selected, the desired therapeutic response, the route of administration, the formulation and other factors known to those of skill in the art.

[1511] In some embodiments, the pharmaceutical composition is formulated for intranasal administration and is configured to be administered using a spray device or nasal inhaler. The spray device or nasal inhaler may be configured to deliver about 1mg to about 100mg per spray. In some embodiments, the spray device or nasal inhaler is configured to deliver 1mg to 100mg, 5mg to 90mg, 10mg to 80mg, 15mg to 70mg, 20mg to 60mg, 25mg, to 50mg, or 30mg to 40mg per spray.

[1512] In some embodiments, the pharmaceutical composition is formulated for intranasal administration and has a pH approximating the normal pH range of the nasal fluid. Accordingly, in some embodiments, the pharmaceutical composition has a pH ranging from about 5.5 to about 6.5. In some embodiments, the pharmaceutical composition has a pH of about 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, or 6.5.

[1513] Pharmaceutically acceptable carriers and/or excipients that may be included in the pharmaceutical composition formulated for intranasal administration may generally include (i) one or more antioxidants, (ii) one or more preservatives, (iii) one or more buffers, (iv) one or more tonicity adjustors, (v) one or more surfactants, (vi) flavor, (vii) propellants, and/or (viii) a vehicle or solvent. In some embodiments, all components are compatible with

the non-naturally occurring melanocortin analog (i.e., do not react or cause the non-naturally occurring melanocortin analog to react) and are homogeneously dispersed or dissolved uniformly in the composition.

[1514] In some embodiments, the pharmaceutically acceptable carriers and/or excipients are isotonic to nasal fluids.

[1515] In order to achieve a desirable tonicity, the pharmaceutical composition formulated for intranasal administration may further include a salt such as sodium chloride, sodium succinate, sodium sulfate, potassium chloride, magnesium chloride, magnesium sulfate, and calcium chloride. In some embodiments, the salt is present in the pharmaceutical composition in a concentration of 0.1 mg/mL to 50 mg/mL, 1 mg/mL to 25 mg/mL, or 5 mg/mL to 10 mg/mL, relative to a total volume of the composition. In some embodiments, the salt is sodium chloride and is present in a concentration of 0.9% by weight.

[1516] When the pharmaceutical composition is formulated for intranasal administration, the composition may comprise a pH buffered aqueous solution as previously described.

[1517] In some embodiments, the pharmaceutical composition is formulated for intranasal administration and comprises sodium acetate in a concentration of about 80 mM to about 100 mM. For example, sodium acetate may be present in the pharmaceutical composition in a molar concentration of 80 mM, 81 mM, 82 mM, 83 mM, 84 mM, 85 mM, 86 mM, 87 mM, 88 mM, 89 mM, 90 mM, 91 mM, 92 mM, 93 mM, 94 mM, 95 mM, 96 mM, 97 mM, 98 mM, 99 mM, or 100 mM.

[1518] In some embodiments, the pharmaceutical composition is formulated for intranasal administration and comprises Tris in a concentration of about 5 mM, 10 mM, 15 mM, 20 mM, 25 mM, 30 mM, 3 5mM, 40 mM, 45 mM, 50 mM, 55 mM, 60 mM, 65 mM, 70 mM, 75 mM, 80 mM, 85 mM, 90 mM, 95 mM, 100 mM, 105 mM, 110 mM, or 120 mM.

[1519] Additionally, when the pharmaceutical composition is formulated for intranasal administration, the composition may further comprise a phosphate, e.g., sodium phosphate. In some embodiments, the pharmaceutical composition is formulated for intranasal

administration and comprises sodium phosphate in a molar concentration of about 5 mM to about 700 mM, relative to a total volume of the composition. For example, sodium phosphate may be present in the pharmaceutical composition in a molar concentration of 5 mM to 700 mM, 10 mM to 600 mM, 20 mM to 500 mM, 30 mM to 400 mM, 40 mM to 300 mM, 50 mM to 200 mM, 60 mM to 100 mM, or 70 mM to 80 mM, relative to a total volume of the composition.

[1520] In some embodiments, the pharmaceutical composition comprises one or more antioxidants. For example, the pharmaceutical composition may comprise ascorbic acid, cysteine, sodium metabisulfite, propyl gallate, butylated hydroxytoluene, and/or butylated hydroxyanisole.

[1521] In some embodiments, the pharmaceutical composition comprises a surfactant, such as a sorbitan ester.

[1522] In some embodiments, the pharmaceutical composition comprises a flavoring or scent, such as an aromatic oil.

[1523] In some embodiments, the non-naturally occurring melanocortin analog is solubilized or suspended in a solvent or vehicle. The solvent or vehicle may be purified water, ethyl alcohol, and/or propylene glycol. In some embodiments, the pharmaceutical composition comprises between 0.03 wt% and 1 wt% melanocortin analog solubilized or suspended in a solvent or vehicle. For example, the pharmaceutical composition may comprise the non-naturally occurring melanocortin analog in an amount of about 0.03 wt%, about 0.05 wt%, about 0.1 wt%, about 0.15 wt%, about 0.2 wt%, about 0.25 wt%, about 0.3 wt%, about 0.35 wt%, about 0.4 wt%, about 0.45 wt%, about 0.5 wt%, about 0.55 wt%, about 0.6 wt%, about 0.65 wt%, about 0.7 wt%, about 0.75 wt%, about 0.8 wt%, about 0.85 wt%, about 0.9 wt%, about 0.95 wt%, or about 1 wt%.

[1524] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of about 0.1 mg/mL to about 50 mg/mL, relative to a total volume of the composition. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition in a concentration of 0.1 mg/mL to 50 mg/mL, 0.5 mg/mL to 40 mg/mL, 1 mg/mL to 30 mg/mL,

2.5 mg/mL to 20 mg/mL, 5 g/mL to 15 mg/mL, or 5 mg/mL to 10 mg/mL, relative to a total volume of the pharmaceutical composition. Any of the non-naturally occurring melanocortin analogs and corresponding concentrations described previously with reference to the pharmaceutical composition may be present in the pharmaceutical composition at the same or substantially similar concentrations.

Administration

[1525] The pharmaceutical compositions of the present technology may be administered once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day.

[1526] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day.

[1527] In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the non-naturally occurring melanocortin analog is present in the pharmaceutical composition at a dose of about 10 mg in a dose volume of about 1 mL, and

wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In some embodiments, the administration is performed once monthly.

[1528] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572and is present in the second pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572is present in the second pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267,

269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572is present in the second pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572 is present in the second pharmaceutical composition at a dose of about 10 mg in a dose volume of about 1 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In still other embodiments, the administration is performed once monthly.

[1529] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572and is present in the second pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-

138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572 is present in the second pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572is present in the second pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572is present in the second pharmaceutical composition at a dose of about 10 mg in a dose volume of about 1 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In still other embodiments, the administration is performed once monthly.

[1530] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87,

90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is present in the second pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572is present in the second pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572is present in the second pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 is present in the second pharmaceutical composition at a dose of about

10 mg in a dose volume of about 1 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In still other embodiments, the administration is performed once monthly.

[1531] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is present in the second pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 is present in the second pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 is present in the second pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice

per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 is present in the second pharmaceutical composition at a dose of about 10 mg in a dose volume of about 1 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In still other embodiments, the administration is performed once monthly.

[1532] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is present in the second pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 is present in the second pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 is present in the second pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per

day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 is present in the second pharmaceutical composition at a dose of about 10 mg in a dose volume of about 1 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In still other embodiments, the administration is performed once monthly.

[1533] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is present in the second pharmaceutical composition at a dose of about 5 mg to about 500 mg in a dose volume of about 1 mL to 20 mL, and wherein the administration is once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 is present in the second pharmaceutical composition at a dose of about 50 mg to about 100 mg in a dose volume of about 2 mL to 10 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 is present in the second pharmaceutical composition at a dose of about 75 mg in a dose volume of about 5 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517,

524, 529, 539-544, 550, 554, and 556-561 is present in the second pharmaceutical composition at a dose of about 10 mg in a dose volume of about 1 mL, and wherein the administration is performed once monthly, once every three weeks, once every two weeks, once per week, twice per week, 3 times per week, 4 times per week, 5 times per week, once per day, twice per day, 3 times per day, 4 times per day, 5 times per day, or 10 times per day. In some embodiments, the administration is performed once per day. In other embodiments, the administration is performed once weekly. In still other embodiments, the administration is performed once monthly.

[1534] In some embodiments, the non-naturally occurring melanocortin analog or a pharmaceutical composition thereof is administered hourly (such as every hour, every 2 hours, every 4 hours, every 8 hours, etc.), once a day, or twice a day. In some embodiments, the non-naturally occurring melanocortin analog is administered every morning, every evening, or every afternoon. In some embodiments, the non-naturally occurring melanocortin analog is administered before a meal, after a meal, or with a meal.

[1535] In some embodiments, the non-naturally occurring melanocortin analog or pharmaceutical composition thereof may be administered as a dosing regimen comprising once, twice, or three times daily administration on a (i) weekly; (ii) every other week; (iii) one week of therapy followed by two, three or four weeks off; (iv) two weeks of therapy followed by one, two, three or four weeks off; (v) three weeks of therapy followed by one, two, three, four or five week off; (vi) four weeks of therapy followed by one, two, three, four or five week off; (vii) five weeks of therapy followed by one, two, three, four or five week off; or (viii) monthly schedule. The (i)-(viii) schedules may be repeated 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 times or more. In some embodiments, the non-naturally occurring melanocortin analog or pharmaceutical composition thereof is administered at various dosages during the dosing regimen (e.g., a first dose with an effective amount of 10 mg/kg and a second dose with an effective amount of 5 mg/kg).

[1536] In some embodiments, the non-naturally occurring melanocortin analog or pharmaceutical composition thereof is administered once every other day, once every 2 or 3 days, once every third day, once per week, once every other week, once every third week, once every month, once every six weeks, once every other month, once every three months,

once every six months, or once per year. Administration of the non-naturally occurring melanocortin analog or pharmaceutical composition thereof at any of the dosing frequencies of the present technology may be repeated for a total of at least 2 dosages, at least 3 dosages, at least 4 dosages, at least 5 dosages, at least 10 dosages, at least 15 dosages, at least 20 dosages, at least 30 dosages, at least 40 dosages, at least 50 dosages or more. In some embodiments, the frequency of dosages of the non-naturally occurring melanocortin analog or pharmaceutical composition thereof is the same during a treatment regimen. In other embodiments, the frequency of dosages of the non-naturally occurring melanocortin analog or pharmaceutical composition thereof is different during a treatment regimen. The non-naturally occurring melanocortin analog or the pharmaceutical composition thereof may be administered even less frequently. Alternatively, the dosage regimen may be decreased or increased from an initial dosing regimen for days, weeks, months, or years. In some embodiments, the dosing regimen is repeated at other intervals.

Dosing

[1537] In some embodiments, the pharmaceutical compositions of the present technology are formulated to provide a dose of about 1 mg, about 2 mg, about 3 mg, about 5 mg, about 10 mg, about 15 mg, about 20 mg, about 25 mg, about 30 mg, about 40 mg, about 50 mg, about 60 mg, about 75 mg, about 100 mg, about 125 mg, about 150 mg, about 175 mg, about 200 mg, about 225 mg, about 250 mg, about 275 mg, about 300 mg, about 325 mg, about 350 mg, about 375 mg, about 400 mg, about 425 mg, about 450 mg, about 475 mg, or about 500 mg of the non-naturally occurring melanocortin analog to the subject in need thereof.

[1538] In some embodiments, the pharmaceutical compositions of the present technology are formulated to provide a dose of at least 1 mg, at least 2 mg, at least 3 mg, at least 5 mg, at least 10 mg, at least 15 mg, at least 20 mg, at least 25 mg, at least 30 mg, at least 40 mg, at least 50 mg, at least 60 mg, at least 75 mg, at least 100 mg, at least 125 mg, at least 150 mg, at least 175 mg, at least 200 mg, at least 225 mg, at least 250 mg, at least 275 mg, at least 300 mg, at least 325 mg, at least 350 mg, at least 375 mg, at least 400 mg, at least 425 mg, at least 450 mg, at least 475 mg, or at least 500 mg of the non-naturally occurring melanocortin analog to the subject in need thereof.

[1539] In some embodiments, the pharmaceutical compositions of the present technology are formulated to provide a dose of at least about 1 mg, at least about 2 mg, at least about 3 mg, at least about 5 mg, at least about 10 mg, at least about 15 mg, at least about 20 mg, at least about 25 mg, at least about 30 mg, at least about 40 mg, at least about 50 mg, at least about 60 mg, at least about 75 mg, at least about 100 mg, at least about 125 mg, at least about 150 mg, at least about 175 mg, at least about 200 mg, at least about 225 mg, at least about 250 mg, at least about 275 mg, at least about 300 mg, at least about 325 mg, at least about 350 mg, at least about 375 mg, at least about 400 mg, at least about 425 mg, at least about 450 mg, at least about 475 mg, or at least about 500 mg of the non-naturally occurring melanocortin analog to the subject in need thereof.

[1540] In some embodiments, the compositions of the present technology are administered to the subject at a dose that is based on the subject's BMI. In some embodiments, two or more doses of the compositions of the present technology are administered to the subject, wherein the two or more doses are titrated (e.g., inversely titrated) based on the subject's BMI at the time of each administration.

[1541] In some embodiments, the pharmaceutical compositions of the present technology are formulated to provide a dose of about 0.001 mg/kg, about 0.005 mg/kg, about 0.01 mg/kg, about 0.05 mg/kg, about 0.10 mg/kg, about 0.5 mg/kg, about 1 mg/kg, about 2 mg/kg, about 3 mg/kg, about 5 mg/kg, about 10 mg/kg, about 15 mg/kg, about 20 mg/kg, about 25 mg/kg, about 30 mg/kg, about 40 mg/kg, about 50 mg/kg, about 60 mg/kg, about 75 mg/kg, about 100 mg/kg, about 125 mg/kg, about 150 mg/kg, about 175 mg/kg, about 200 mg/kg, about 225 mg/kg, about 250 mg/kg, about 275 mg/kg, about 300 mg/kg, about 325 mg/kg, about 350 mg/kg, about 375 mg/kg, about 400 mg/kg, about 425 mg/kg, about 450 mg/kg, about 475 mg/kg, or about 500 mg/kg of the non-naturally occurring melanocortin analog to the subject in need thereof.

[1542] In some embodiments, the pharmaceutical compositions of the present technology are formulated to provide a dose of at least 0.001 mg/kg, at least 0.005 mg/kg, at least 0.01 mg/kg, at least 0.05 mg/kg, at least 0.10 mg/kg, at least 0.5 mg/kg, at least 1 mg/kg, at least 2 mg/kg, at least 3 mg/kg, at least 5 mg/kg, at least 10 mg/kg, at least 15 mg/kg, at least 20 mg/kg, at least 25 mg/kg, at least 30 mg/kg, at least 40 mg/kg, at least 50

mg/kg, at least 60 mg/kg, at least 75 mg/kg, at least 100 mg/kg, at least 125 mg/kg, at least 150 mg/kg, at least 175 mg/kg, at least 200 mg/kg, at least 225 mg/kg, at least 250 mg/kg, at least 275 mg/kg, at least 300 mg/kg, at least 325 mg/kg, at least 350 mg/kg, at least 375 mg/kg, at least 400 mg/kg, at least 425 mg/kg, at least 450 mg/kg, at least 475 mg/kg, or at least 500 mg/kg of the non-naturally occurring melanocortin analog to the subject in need thereof.

[1543] In some embodiments, the pharmaceutical compositions of the present technology are formulated to provide a dose of at least about 0.001 mg/kg, at least about 0.005 mg/kg, at least about 0.01 mg/kg, at least about 0.05 mg/kg, at least about 0.10 mg/kg, at least about 0.5 mg/kg, at least about 1 mg/kg, at least about 2 mg/kg, at least about 3 mg/kg, at least about 5 mg/kg, at least about 10 mg/kg, at least about 15 mg/kg, at least about 20 mg/kg, at least about 25 mg/kg, at least about 30 mg/kg, at least about 40 mg/kg, at least about 50 mg/kg, at least about 60 mg/kg, at least about 75 mg/kg, at least about 100 mg/kg, at least about 125 mg/kg, at least about 150 mg/kg, at least about 175 mg/kg, at least about 200 mg/kg, at least about 225 mg/kg, at least about 250 mg/kg, at least about 275 mg/kg, at least about 300 mg/kg, at least about 325 mg/kg, at least about 350 mg/kg, at least about 375 mg/kg, at least about 400 mg/kg, at least about 425 mg/kg, at least about 450 mg/kg, at least about 475 mg/kg, or at least about 500 mg/kg of the non-naturally occurring melanocortin analog to the subject in need thereof.

[1544] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 5 mg/kg to about 500 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg/kg to about 250 mg/kg per body weight of the subject once daily. In some embodiments, non-naturally occurring melanocortin analog is administered at a dose of about 15 mg/kg to about 100 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 20 mg/kg to about 75 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 30 mg/kg or 60 mg/kg per body weight of the subject once daily.

[1545] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 5 mg/kg to at least 500 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 10 mg/kg to at least 250 mg/kg per body weight of the subject once daily. In some embodiments, non-naturally occurring melanocortin analog is administered at a dose of at least 15 mg/kg to at least 100 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 20 mg/kg to at least 75 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 30 mg/kg or 60 mg/kg per body weight of the subject once daily.

[1546] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 5 mg/kg to at least about 500 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 10 mg/kg to at least about 250 mg/kg per body weight of the subject once daily. In some embodiments, non-naturally occurring melanocortin analog is administered at a dose of at least about 15 mg/kg to at least about 100 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 20 mg/kg to at least about 75 mg/kg per body weight of the subject once daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 30 mg/kg or 60 mg/kg per body weight of the subject once daily.

[1547] In some embodiments, the non-naturally occurring melanocortin analog is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject.

[1548] In some embodiments, the non-naturally occurring melanocortin analog is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10

mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1549] In some embodiments, the non-naturally occurring melanocortin analog is administered at least once daily in an amount ranging from at least 0.5 mg/kg to at least 10 mg/kg, at least 1 mg/kg to at least 7.5 mg/kg, or at least 2.5 mg/kg to at least 5 mg/kg per body weight of the subject.

[1550] In some embodiments, the non-naturally occurring melanocortin analog is administered about once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1551] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 5 mg/kg, about 10 mg/kg, about 15 mg/kg, about 20 mg/kg, about 25 mg/kg, about 30 mg/kg, about 35 mg/kg , about 40 mg/kg, about 50 mg/kg, about 65 mg/kg, about 70 mg/kg, about 75 mg/kg, about 80 mg/kg, about 85 mg/kg, about 90 mg/kg, about 95 mg/kg, about 100 mg/kg, about 125 mg/kg, about 150 mg/kg, about 175 mg/kg, about 200 mg/kg, about 250 mg/kg, about 300 mg/kg, about 350 mg/kg, about 400 mg/kg, about 450 mg/kg, or about 500 mg/kg per body weight of the subject once daily.

[1552] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 5 mg/kg, at least 10 mg/kg, at least 15 mg/kg, at least 20 mg/kg, at least 25 mg/kg, at least 30 mg/kg, at least 35 mg/kg , at least 40 mg/kg, at least 50 mg/kg, at least 65 mg/kg, at least 70 mg/kg, at least 75 mg/kg, at least 80 mg/kg, at least 85 mg/kg, at least 90 mg/kg, at least 95 mg/kg, at least 100 mg/kg, at least 125 mg/kg, at least 150 mg/kg, at least 175 mg/kg, at least 200 mg/kg, at least 250 mg/kg, at least 300 mg/kg, at least 350 mg/kg, at least 400 mg/kg, at least 450 mg/kg, or at least 500 mg/kg per body weight of the subject once daily.

[1553] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 5 mg/kg, at least about 10 mg/kg, at least about 15 mg/kg, at least about 20 mg/kg, at least about 25 mg/kg, at least about 30 mg/kg, at least about 35 mg/kg , at least about 40 mg/kg, at least about 50 mg/kg, at least about 65 mg/kg,

at least about 70 mg/kg, at least about 75 mg/kg, at least about 80 mg/kg, at least about 85 mg/kg, at least about 90 mg/kg, at least about 95 mg/kg, at least about 100 mg/kg, at least about 125 mg/kg, at least about 150 mg/kg, at least about 175 mg/kg, at least about 200 mg/kg, at least about 250 mg/kg, at least about 300 mg/kg, at least about 350 mg/kg, at least about 400 mg/kg, at least about 450 mg/kg, or at least about 500 mg/kg per body weight of the subject once daily.

[1554] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 5 mg/kg per body weight of the subject once daily.

[1555] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 5 mg/kg per body weight of the subject once daily.

[1556] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 5 mg/kg per body weight of the subject once daily.

[1557] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg/kg per body weight of the subject once daily.

[1558] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 10 mg/kg per body weight of the subject once daily.

[1559] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 10 mg/kg per body weight of the subject once daily.

[1560] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 15 mg/kg per body weight of the subject once daily.

[1561] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 15 mg/kg per body weight of the subject once daily.

[1562] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 15 mg/kg per body weight of the subject once daily.

[1563] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 20 mg/kg per body weight of the subject once daily.

[1564] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 20 mg/kg per body weight of the subject once daily.

[1565] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 20 mg/kg per body weight of the subject once daily.

[1566] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 25 mg/kg per body weight of the subject once daily.

[1567] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 25 mg/kg per body weight of the subject once daily.

[1568] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 25 mg/kg per body weight of the subject once daily.

[1569] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 30 mg/kg per body weight of the subject once daily.

[1570] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 30 mg/kg per body weight of the subject once daily.

[1571] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 30 mg/kg per body weight of the subject once daily.

[1572] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 35 mg/kg per body weight of the subject once daily.

[1573] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 35 mg/kg per body weight of the subject once daily.

[1574] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 35 mg/kg per body weight of the subject once daily.

[1575] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 40 mg/kg per body weight of the subject once daily.

[1576] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 40 mg/kg per body weight of the subject once daily.

[1577] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 40 mg/kg per body weight of the subject once daily.

[1578] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 50 mg/kg per body weight of the subject once daily.

[1579] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 50 mg/kg per body weight of the subject once daily.

[1580] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 50 mg/kg per body weight of the subject once daily.

[1581] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 5 mg/kg, about 10 mg/kg, about 15 mg/kg, about 20 mg/kg, about 25 mg/kg, about 30 mg/kg, about 35 mg/kg , about 40 mg/kg, about 50 mg/kg, about 65 mg/kg, about 70 mg/kg, about 75 mg/kg, about 80 mg/kg, about 85 mg/kg, about 90 mg/kg, about 95 mg/kg, about 100 mg/kg, about 125 mg/kg, about 150 mg/kg, about 175 mg/kg, about 200 mg/kg, about 250 mg/kg, about 300 mg/kg, about 350 mg/kg, about 400 mg/kg, about 450 mg/kg, or about 500 mg/kg per body weight of the subject twice daily.

[1582] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least 5 mg/kg, at least 10 mg/kg, at least 15 mg/kg, at least 20 mg/kg, at least 25 mg/kg, at least 30 mg/kg, at least 35 mg/kg , at least 40 mg/kg, at least 50 mg/kg, at least 65 mg/kg, at least 70 mg/kg, at least 75 mg/kg, at least 80 mg/kg, at least 85 mg/kg, at least 90 mg/kg, at least 95 mg/kg, at least 100 mg/kg, at least 125 mg/kg, at least 150 mg/kg, at least 175 mg/kg, at least 200 mg/kg, at least 250 mg/kg, at least 300 mg/kg, at least 350 mg/kg, at least 400 mg/kg, at least 450 mg/kg, or at least 500 mg/kg per body weight of the subject twice daily.

[1583] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 5 mg/kg, at least about 10 mg/kg, at least about 15 mg/kg, at least about 20 mg/kg, at least about 25 mg/kg, at least about 30 mg/kg, at least about 35 mg/kg , at least about 40 mg/kg, at least about 50 mg/kg, at least about 65 mg/kg, at least about 70 mg/kg, at least about 75 mg/kg, at least about 80 mg/kg, at least about 85 mg/kg, at least about 90 mg/kg, at least about 95 mg/kg, at least about 100 mg/kg, at least about 125 mg/kg, at least about 150 mg/kg, at least about 175 mg/kg, at least about 200 mg/kg, at least about 250 mg/kg, at least about 300 mg/kg, at least about 350 mg/kg, at least

about 400 mg/kg, at least about 450 mg/kg, or at least about 500 mg/kg per body weight of the subject twice daily.

[1584] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 5 mg/kg per body weight of the subject twice daily.

[1585] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg/kg per body weight of the subject twice daily.

[1586] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 15 mg/kg per body weight of the subject twice daily.

[1587] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 20 mg/kg per body weight of the subject twice daily.

[1588] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 25 mg/kg per body weight of the subject twice daily.

[1589] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 30 mg/kg per body weight of the subject twice daily.

[1590] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 35 mg/kg per body weight of the subject twice daily.

[1591] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 40 mg/kg per body weight of the subject twice daily.

[1592] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 50 mg/kg per body weight of the subject twice daily.

[1593] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 5 mg/kg per body weight of the subject twice daily.

[1594] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg/kg per body weight of the subject twice daily.

[1595] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 15 mg/kg per body weight of the subject twice daily.

[1596] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 20 mg/kg per body weight of the subject twice daily.

[1597] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 25 mg/kg per body weight of the subject twice daily.

[1598] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 30 mg/kg per body weight of the subject twice daily.

[1599] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 35 mg/kg per body weight of the subject twice daily.

[1600] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 40 mg/kg per body weight of the subject twice daily.

[1601] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of about 50 mg/kg per body weight of the subject twice daily.

[1602] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 5 mg/kg per body weight of the subject twice daily.

[1603] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 10 mg/kg per body weight of the subject twice daily.

[1604] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 15 mg/kg per body weight of the subject twice daily.

[1605] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 20 mg/kg per body weight of the subject twice daily.

[1606] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 25 mg/kg per body weight of the subject twice daily.

[1607] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 30 mg/kg per body weight of the subject twice daily.

[1608] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 35 mg/kg per body weight of the subject twice daily.

[1609] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 40 mg/kg per body weight of the subject twice daily.

[1610] In some embodiments, the non-naturally occurring melanocortin analog is administered at a dose of at least about 50 mg/kg per body weight of the subject twice daily.

[1611] In some embodiments, the non-naturally occurring melanocortin analog is administered at one or more doses. In some embodiments, the non-naturally occurring melanocortin analog is administered at two or more doses.

[1612] In some embodiments, the non-naturally occurring melanocortin analog is administered at a first dose once daily or twice daily. In some embodiments, the non-naturally occurring melanocortin analog is administered at a second dose once daily or twice daily.

[1613] In some embodiments, the non-naturally occurring melanocortin analog is administered at a first dose once daily for about 5 days to about 10 days. In some embodiments, the non-naturally occurring melanocortin analog is administered at a second dose once daily for about 5 days to about 10 days, after administration of the first dose. In some embodiments, the non-naturally occurring melanocortin analog is administered at a third dose twice daily for about 7 days to about 21 days, after administration of the second dose. In some embodiments, the second dose is greater than the first dose. In some embodiments, the third dose comprises a cumulative dose that is greater than the second dose.

[1614] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg to about 20 mg/kg administered once a day for about 5 days to about 10 days; (ii) at a second dose of about 10 mg/kg to about 40 mg/kg administered once a day after administration of the first dose for about 5 days to about 10 days; (iii) at a third dose of about 5 mg/kg to about 30 mg/kg administered twice a day after administration of the second dose for at least about 5 days to about 10 days. In some embodiments, the third dose is administered twice a day for at least about 7 days or more.

[1615] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg, about 10 mg/kg, about 15 mg/kg, or about

20 mg/kg administered once a day for about 5 days, about 6 days, about 7 days, about 8 days, about 9 days, or about 10 days; (ii) at a second dose of about 10 mg/kg, about 15 mg/kg, about 20 mg/kg, about 25 mg/kg, about 30 mg/kg, about 35 mg/kg, or about 40 mg/kg administered once a day after administration of the first dose about 5 days, about 6 days, about 7 days, about 8 days, about 9 days, or about 10 days; (iii) at a third dose of about 5 mg/kg, about 10 mg/kg, about 15 mg/kg, about 20 mg/kg, about 25 mg/kg, or about 30 mg/kg administered twice a day after administration of the second dose for at least about 5 days, about, 6 days, about 7 days, about 8 days, about 9 days, or about 10 days. In some embodiments, the third dose is administered twice a day for at least about 7 days, about 8 days, about 9 days, about 10 days, about 11 days, about 12 days, about 13 days, or about 14 days or more.

[1616] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 15 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 10 mg/kg administered twice a day after administration of the second dose for at least about 7 days. In some embodiments, the third dose is administered twice a day for at least about 14 days or more.

[1617] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 10 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 20 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 15 mg/kg administered twice a day after administration of the second dose for at least about 7 days. In some embodiments, the third dose is administered twice a day for at least about 14 days or more.

[1618] In some embodiments, the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 15 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 25 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 20 mg/kg administered twice a day after administration of the second dose for at least about 7 days. In some embodiments, the third dose is administered twice a day for at least about 14 days or more.

[1619] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572and is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1620] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-

201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572and is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1621] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1622] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76,

77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1623] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1624] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg, 0.01 mg/kg to 20 mg/kg, 0.05 mg/kg to 15 mg/kg, 0.075 mg/kg to 10 mg/kg, 0.1 mg/kg to 8 mg/kg, 0.2 mg/kg to 6 mg/kg, 0.3 mg/kg to 4 mg/kg, 0.4 mg/kg to 2 mg/kg, or 0.5 mg/kg to 1 mg/kg per body weight of the subject. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is administered at least once daily in an amount ranging from about 0.5 mg/kg to about 10 mg/kg, about 1 mg/kg to about 7.5 mg/kg, or about 2.5 mg/kg to about 5 mg/kg per body weight of the subject.

[1625] In some embodiments, the non-naturally occurring melanocortin analog is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20

mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to about 90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg, about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-naturally occurring melanocortin analog is administered at least once daily in an amount of about 50 mg.

[1626] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572 and is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20 mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572and is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572and is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to

about 90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg, about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572 and is administered at least once daily in an amount of about 50 mg.

[1627] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572and is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20 mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572and is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572and is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to about

90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg, about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572 and is administered at least once daily in an amount of about 50 mg.

[1628] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20 mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to about 90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg, about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-

naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572 and is administered at least once daily in an amount of about 50 mg.

[1629] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20 mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to about 90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg, about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350 and is administered at least once daily in an amount of about 50 mg.

[1630] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20 mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to about 90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg, about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561 and is administered at least once daily in an amount of about 50 mg.

[1631] In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is administered at least once daily in an amount of about 0.1 mg to about 100 mg, 0.5 mg to about 50 mg, about 1 mg to about 40 mg, about 2.5 mg to about 30 mg, about 5 to about 20 mg, or about 7.5 to about 15 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is administered once daily in an amount of about 10 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is administered at least once daily in an amount of about 1 mg to about 100 mg, about 5 mg to about 95 mg, about 10 mg to about 90 mg, about 15 mg to about 85 mg, about 20 mg to about 80 mg, about 25 mg to about 75 mg, about 30 mg to about 70 mg, about 35 mg to about 65 mg,

about 40 to about 60 mg, or about 45 to about 55 mg. In some embodiments, the non-naturally occurring melanocortin analog is any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561 and is administered at least once daily in an amount of about 50 mg.

[1632] In some embodiments, administration of the non-naturally occurring melanocortin analog comprises delivery across the blood brain barrier. In some embodiments, administration of the non-naturally occurring melanocortin analog comprises delivery across the epithelium. In some embodiments, administration of the non-naturally occurring melanocortin analog comprises delivery across the epithelium and the blood brain barrier. In some embodiments, administration of the non-naturally occurring melanocortin analog comprises delivery through the gastrointestinal tract.

Methods

[1633] The present technology comprises methods of treating, preventing, reducing, or otherwise ameliorating one or more symptoms or conditions that may benefit from weight gain or a reduction in weight loss. The methods comprise administering a non-naturally occurring melanocortin analog of the present technology to a subject in need thereof. The methods may promote fat gain (e.g., epididymal fat or perirenal fat), increase muscle mass, increase body weight, accelerate weight gain, increase fat mass to lean mass ratio, improve body composition and/or BMI (e.g., for underweight conditions), increase waist circumference, increase cardiac mass, increase brain mass, or any combination thereof, relative to a control. In some embodiments, the methods of the present technology increase a fat mass or a lean mass (e.g., muscle, organ, and bone mass) in the subject, relative to a control.

[1634] In some embodiments, the methods of the present technology reduce a loss in or a rate of loss in fat (e.g., epididymal fat or perirenal fat), muscle mass, body weight, weight gain, fat mass to lean mass ratio, BMI, a BMI durability, waist circumference, cardiac mass, brain mass, or any combination thereof, relative to a control.

[1635] In some embodiments, the present technology comprises methods of treating, preventing, reducing, or otherwise ameliorating one or more symptoms or conditions

associated with cachexia, anorexia, or other conditions benefiting from weight gain in a subject by administering a non-naturally occurring melanocortin analog to the subject. The methods may promote lean mass gain, increase lean mass, maintain healthy lean mass, maintain a mass, or reduce a mass loss in the subject. The methods of the present technology may increase a cardiac mass, relative to a control. In some embodiments, the method improves gastrointestinal function and nutrient absorption

[1636] The subject of the methods of the present technology may have cachexia, anorexia, or another condition for which a therapeutic benefit is provided by weight gain or reduced rates of weight loss. In some embodiments, the subject is underweight. In some embodiments, the subject has a metabolic dysfunction or disorder, including, but not limited to, impaired glucose metabolism. In some embodiments, the subject has muscle wasting or sarcopenia.

[1637] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence according to any one of Formulae (I)-(ID). In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572. In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: -7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572. In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553,

555, 562-569, and 571-572In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350. In some embodiments, the non-naturally occurring analog comprises any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561. In some embodiments, the non-naturally occurring analog comprises any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561.

[1638] In some embodiments, the methods of the present technology the risk or incidence of adverse cardiovascular events, such as, cardiovascular death, non-fatal myocardial infarction, non-fatal stroke, angina, sinus tachycardia, coronary artery bypass grafting, percutaneous coronary intervention, heart failure, carotid endarterectomy, peripheral vascular disease, or any combination thereof, and/or decrease gastrointestinal effects such as, nausea, vomiting, and diarrhea that are associated with use of a conventional non-naturally occurring melanocortin analog. The methods may also treat, prevent, or reduce one or more side effects associated with the use of a conventional non-naturally occurring melanocortin analog. For example, methods of reducing lean mass loss, maintaining lean mass, or promoting lean mass gain may prevent or reduce the risk or incidence of adverse cardiovascular events associated with the use of a conventional non-naturally melanocortin agonist, such as sinus tachycardia. Additionally, such methods may reduce hemoglobin A1c levels, decrease inflammation, regulate plasma insulin and/or preserve or improve kidney function in the subject.

[1639] In some embodiments, the present technology comprises methods of increasing, maintaining, or reducing a loss (e.g., a rate of loss or an absolute loss) of muscle mass. In some embodiments, the muscle mass is cardiac muscle mass, skeletal muscle mass, or both. In some embodiments, the cardiac muscle mass is determined by measuring change in heart weight. In some embodiments, the skeletal muscle mass is determined by measuring change in gastrocnemius tissue weight. In related embodiments, the muscle mass change is cardiac muscle mass change, skeletal muscle mass change, or both. In

some embodiments, cardiac muscle is determined by heart weight. In some embodiments, skeletal muscle mass is determined by gastrocnemius tissue weight. In some embodiments, the muscle mass changes may be assessed by using magnetic resonance imaging (MRI) and/or or nuclear magnetic resonance (NMR).

[1640] In some embodiments, the non-naturally occurring melanocortin analog comprises a sequence according to any one of Formulae (I)-(ID). In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572. In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: -7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, and 571-572. In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, and 571-572In some embodiments, the non-naturally occurring analog comprises a sequence of any one of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, and 344-350. In some embodiments, the non-naturally occurring analog comprises any one of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, and 538-561. In some embodiments, the non-naturally occurring analog comprises any one of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, and 556-561.

[1641] The methods of the present technology may be performed on the subject for about 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, or 5 years. In some embodiments, the pharmaceutical composition is administered to the subject for about 1 day, about 2 days, about 5 days, about 6 days, about 1 week, about 1 month, about 2 months, about 3 months, about 4 months, about 5 months, about 6 months, about 9 months, about 1 year, about 2 years, about 3 years, about 4 years, or about 5 years.

[1642] In some embodiments, a method of the present technology is performed on the subject for about 1 day, 7 days, 14 days, 21 days, 28 days, 35 days, 40 days, 45 days, 50 days, 60 days, 75 days, 90 days, 100 days, 110 days, or 120 days.

[1643] The methods of the present technology may be performed on the subject for at least 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, or 5 years. In some embodiments, the pharmaceutical composition is administered to the subject for at least 1 day, at least 2 days, at least 5 days, at least 6 days, at least 1 week, at least 1 month, at least 2 months, at least 3 months, at least 4 months, at least 5 months, at least 6 months, at least 9 months, at least 1 year, at least 2 years, at least 3 years, at least 4 years, or at least 5 years.

[1644] In some embodiments, a method of the present technology is performed on the subject for at least 1 day, 7 days, 14 days, 21 days, 28 days, 35 days, 40 days, 45 days, 50 days, 60 days, 75 days, 90 days, 100 days, 110 days, or 120 days.

[1645] The methods of the present technology may be performed on the subject for at least about 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, or 5 years. In some embodiments, the pharmaceutical composition is administered to the subject for at least about 1 day, at least about 2 days, at least about 5 days, at least about 6 days, at least about 1 week, at least about 1 month, at least about 2 months, at least about 3 months, at least about 4 months, at least about 5 months, at least about 6 months, at least about 9 months, at least about 1 year, at least about 2 years, at least about 3 years, at least about 4 years, or at least about 5 years.

[1646] In some embodiments, a method of the present technology is performed on the subject for at least about 1 day, 7 days, 14 days, 21 days, 28 days, 35 days, 40 days, 45 days, 50 days, 60 days, 75 days, 90 days, 100 days, 110 days, or 120 days.

Maintenance Doses

[1647] In some embodiments, a maintenance dose of the non-naturally occurring melanocortin analog is administered to the subject to maintain weight and/or continue weight increase.

Subjects

[1648] In some embodiments, the subject is a mammal, including but not limited to a human, a non-human primate such as a chimpanzee, a domestic livestock or a farm animal such as a cow, a bison, sheep, a pig, a goat, a horse, a chicken, and a rooster, a domestic pet animal such as a dog, a cat, a rat, a mouse, and a rabbit, and a laboratory subject such as a rodent, including a rat, a mouse, and a guinea pig. In some embodiments, the subject is a human. In some embodiments, the subject is an animal such as a rat or a dog.

[1649] In some embodiments, the subject has a body mass index (BMI) of 18.5 kg/m^2 to 35 kg/m^2. In some embodiments, the subject has a BMI of less than 35 kg/m^2. In some embodiments, the subject has a BMI of less than 18.5 kg/m^2.

[1650] In some embodiments, the subject is an underweight subject. Underweight subjects include those having a body weight about 3%, 5% or less, 10% or less, 20% or less, or 30% or less, than the lower end of "normal" BMI (e.g., 18.5 kg/m2).

[1651] In some embodiments, the subject has a metabolic dysfunction.

Controls

[1652] The controls of the present technology may comprise the subject at baseline. In some embodiments, the controls of the methods of the present technology comprise a subject that is not administered a non-naturally occurring melanocortin analog of the present technology or a subject subjected to a method lacking one or more steps of the methods of the present technology.

EXAMPLES

[1653] The following examples are intended to illustrate various embodiments of the present technology. As such, the specific embodiments discussed are not to be construed

as limitations on the scope of the present technology. It will be apparent to one skilled in the art that various equivalents, changes, and modifications may be made without departing from the scope of present technology, and it is understood that such equivalent embodiments, are to be included herein. Further, all references cited herein are hereby incorporated by reference in their entirety, as if fully set forth herein.

Example 1: Peptide Synthesis-Generic

[1654] The non-naturally occurring melanocortin analogs of the present technology were synthesized by conventional procedures (e.g., solution-phase procedure, solid-phase synthesis) for the formation of a peptide linkage between amino acids. The solution-phase procedure involved a condensation between the free alpha amino group of an amino acid or derivative thereof having the carboxyl group or other reactive groups protected and the free primary carboxyl group of another amino acid or derivative thereof having the amino group or other reactive groups protected. The solid-phase synthesis utilized a variety of resins and reagents and may involve additional purification steps.

[1655] The process for synthesizing the non-naturally occurring melanocortin analogs was generally performed by a procedure as follows. Each amino acid in the desired sequence of the non-naturally occurring melanocortin analogs was added one at a time in succession to another amino acid or derivative thereof or by a procedure whereby peptide fragments with the desired amino acid sequence were first synthesized conventionally and then condensed to provide the desired peptide. In most cases, the resulting peptide was then cyclized to yield a cyclic peptide.

[1656] Solid-phase peptide synthesis was carried out by sequentially incorporating the desired amino acid residues one at a time into the growing peptide chain coupled to a solid-phase support according to the general principles of solid phase methods (see Merrifield, Angew Chem. 24:799-810 (1985) and Barany et al., The Peptides, Analysis, Synthesis and Biology, Vol. 2, Gross E. and Meienhofer J., Eds. Academic Press 1-284 (1980)). An exemplary solid-phase synthesis of non-naturally occurring melanocortin analogs is provided below.

[1657] Initially, the C-terminal amino acid residue of the non-naturally occurring melanocortin analog was coupled to a solid-phase support, e.g., a solid-phase resin. Coupling of the C-terminal amino acid residue and the solid-phase support may be carried out according to any method know in the art. Depending on the coupling method, the alpha-amine of the C-terminal amino acid residue may or may not be protected with an amine protecting group, as described below. Likewise, the carboxyl group of the amino acid residue may or may not be activated prior to coupling to the solid-phase support in order to increase its electrophilicity. Some methods of coupling rely on the formation of an ester bond between the carboxyl group of the amino acid and a reactive handle on the solid-phase resin. For example, an amino acid residue may be coupled to a p-benzyloxybenzyl alcohol resin (Wang) or a 2-chlorotrityl chloride resin via an ester linkage. Some methods of coupling rely on the formation of an amide bond between the carboxyl group of the amino acid and a reactive handle on the solid-phase resin For example, an amino acid residue may be coupled to a benzhydrylamine (BHA) resin through an Fmoc-linker such as, for example, p-[(R,S)-α-[1-(9H-fluor-en-9-yl)-methoxyformamido]-2,4-dimethyloxybenzyl]-phenoxyacetic acid (Rink linker) via an amide linkage.

[1658] The non-naturally occurring melanocortin analog was then synthesized by sequential amino acid addition or combination of peptide fragments. Subsequently, the peptide was cleaved from the solid-phase support and purified by methods known in the art, such as, for example, reverse phase high performance liquid chromatography (RP-HPLC) using a suitable column, such as a C18 column. Additionally, or alternatively, other methods of separation or purification were employed, including, but not limited to, methods based on the size or charge of the peptide. Once purified, the peptide was characterized by methods such as high-performance liquid chromatograph (HPLC), amino acid analysis, mass spectrometry, and the like.

Example 2: Peptide Synthesis-Protecting Groups

[1659] During synthesis of the non-naturally occurring melanocortin analogs, reactive side chain groups of the various amino acid residues were protected with suitable protecting groups, which prevented undesirable chemical reaction from occurring at that site until the protecting group was removed.

[1660] Additionally, protection of the alpha amino group of an amino acid residue or fragment was performed while that entity reacting with the carboxyl group, followed by the selective removal of the alpha amino protecting group to allow a subsequent reaction to take place at that site. Specific protecting groups for solid phase synthesis methods and solution phase synthesis methods are known to those having ordinary skill in the art. Alpha amino groups were protected by a suitable protecting group, including a urethane-type protecting group, such as benzyloxycarbonyl (Z) and substituted benzyloxycarbonyl, such as p-chlorobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-bromobenzyloxycarbonyl, p-biphenyl-isopropoxycarbonyl, 9-fluorenylmethoxycarbonyl (Fmoc) and p-methoxybenzyloxycarbonyl (Moz); aliphatic urethane-type protecting groups, such as t-butyloxycarbonyl (Boc), diisopropylmethoxycarbonyl, isopropoxycarbonyl, and allyloxycarbonyl. Fmoc was also used for alpha amino protection. Guanidino groups, if present, were protected by a suitable protecting group, such as nitro, p-toluenesulfonyl (Tos), Z, pentamethylchromanesulfonyl (Pmc), adamantyloxycarbonyl, pentamethyldihydrobenzofuran-5-sulfonyl (Pbf) and Boc. Pmc was used as a protecting group for Arg.

[1661] Alpha aminoprotecting groups may be removed under basic conditions, such as, for example, using a solution of piperidine, piperazine, diethylamine, or morpholine (20-40% v/v) in N,N-dimethylformamide (DMF). In synthesis methods in which alpha amino protecting groups were used, protecting groups were removed after synthesis of the peptide and before or after cleavage of the solid-phase support.

Example 3: Peptide Synthesis-Additional Modifications

[1662] If necessary, the peptides were further modified to obtain N-terminus modifications, such as acetylation, while on resin, or were removed from the resin by use of a cleaving reagent and then modified. Likewise, C-terminus modification (e.g., amidation), was performed if needed.

[1663] Additionally, the cyclized peptide structures were obtained prior to cleavage from the peptide resin. For cyclization through reactive side chain moieties, the desired side chains were deprotected, and the peptide suspended in a suitable solvent and a cyclic

coupling agent added. Suitable solvents, for example DMF, dichloromethane (DCM) or 1-methyl-2-pyrrolidone (NMP), were used for the cyclization. Suitable cyclic coupling reagents (e.g., 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium tetrafluoroborate (TBTU), 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU), benzotriazole-1-yl-oxy-tris(dimethylamino)phosphoniumhexafluorophosphate (BOP), benzotriazole-1-yl-oxy-tris(pyrrolidino)phosphoniumhexafluorophosphate (PyBOP), 2-(7-aza-1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium tetrafluoroborate (TATU), 2-(2-oxo-1 (2H)-pyridyl)-1,1,3,3-tetramethyluronium tetrafluoroborate (TPTU), N,N′-dicyclohexylcarbodiimide/1-hydroxybenzotriazole (DCCI/HOBt)) were also used for the cyclization. Coupling was initiated by a suitable base, such as N,N-diispropylethylamine (DIPEA), sym-collidine or N-methylmorpholine (NMM).

Example 4: Biological Data

[1664] The agonist and antagonist activity of exemplary non-naturally occurring melanocortin analogs at the melanocortin receptors (e.g., MC1R, MC3R, MC4R, and MC5R) were measured via cAMP accumulation assay, according to the following procedure. Experimental design and execution were conducted by Epics Therapeutics S.A. EuroscreenFast (Bruxelles, Belgium).

Compound Handing

[1665] Compounds were delivered as powder (1 mg) or 10 mM solutions (100 µl) in 100% DMSO. Powders were solubilized in 100% DMSO at a concentration of 10 mM (master solution) in a solvent volume defined. Serial dilutions were performed from master solution in 100% DMSO to obtain intermediate concentrations 200-, 300- or 400-fold higher than the concentrations to be tested, depending on the assay. Each sample was diluted 100-fold in the assay buffer and dispensed in a test plate. Amounts, solvents, and dilutions were estimated based on standard small-molecule drugs. Cell lines used for functional assays are shown in Table 1.

Table 1. Cell lines

Receptor	Accession Number	Cell Line	Reference agonist	Reference antagonist
MC1R	NP_002377.4	CHO-K1	NDP-α-MSH	N/A
MC3R	AAC13541.1 I81V	CHO-K1	NDP-α-MSH	SHU9119
MC4R	NP_005903.2	CHO-K1	NDP-α-MSH	SHU9119
MC5R	NP_005904.1	CHO-K1	NDP-α-MSH	N/A

Compound Testing

[1666] Compounds were tested for (i) agonist and/or antagonist activity at the human MC3 (FAST-0232C) and MC4 (FAST-0233C) receptors, (ii) agonist activity at the human MC1 (FAST-0232C) receptor, and/or (iii) agonist activity at the human MC5 (FAST-0233C) receptor at the following nanomolar concentrations, in duplicate: 0.0001, 0.001, 0.01, 0.03, 0.1, 0.3, 1, 10, 100, and 1,000.

Testing Protocol

[1667] Cyclic AMP (cAMP) Homogenous Time-Resolved Fluorescence (HTRF) assay for Gs coupled receptor:

[1668] CHO-K1 cells expressing recombinant human receptor grown prior to the test in media without antibiotic were detached by gentle flushing with PBS-EDTA (5 mM EDTA), recovered by centrifugation and resuspended in assay buffer (KRH: 5 mM KCl, 1.25 mM MgSO4, 124 mM NaCl, 25 mM HEPES, 13.3 mM Glucose, 1.25 mM KH2PO4, 1.45 mM CaCl2, 0.5 g/l BSA, supplemented with 1mM IBMX or 25µM Rolipram).

[1669] Dose response curves were performed in parallel with the reference compounds.

[1670] For agonist test (384well): 5 µl of cells were mixed with 5 µl of the test compound at increasing concentrations and then incubated 30 min at room temperature. After addition of the lysis buffer containing cAMP-d2 and anti-cAMP cryptate detection reagents, plates were incubated 1-hour at room temperature, and fluorescence ratios were measured according to the manufacturer specification, with the HTRF kit.

[1671] For antagonist test (384well): 5 µl of cells were mixed in the wells of an assay plate with 5 µl of a mix of test compound at increasing concentrations and reference agonist for a final concentration corresponding to the historical EC80. The plates were then incubated 30 min at room temperature. After addition of the lysis buffer containing cAMP-d2 and anti-cAMP cryptate detection reagents, plates were incubated 1-hour at room temperature, and fluorescence ratios were measured according to the manufacturer specification, with the HTRF kit.

Quality Control for Compound Testing

[1672] On each day of experimentation and prior to the testing of compounds, reference compounds were tested at several concentrations in duplicate (n=2) to obtain a dose-response curve and an estimated EC50 and/or IC50 values.

[1673] Reference values thus obtained for the test were compared to historical values obtained from the same receptor and used to validate the experimental session.

[1674] A session was considered as valid only if the reference value was found to be within a 0.5 logs interval from the historical value.

[1675] For replicate determinations, the maximum variability tolerated in the test was of +/-20% around the average of the replicates.

Non-naturally occurring melanocortin analog grouping

[1676] Non-naturally occurring melanocortin analogs were grouped based on structural similarities. Group A included non-naturally occurring melanocortin analogs A1 and A2, both of which are linear peptides comprising the motif Pro-dNal(2')-Arg-Trp. Group A peptides are provided in Table 2.

Table 2. Group A non-naturally occurring melanocortin analogs

SEQ ID NO	Non-naturally occurring melanocortin analog	Formula

13	A1	Ac-Nle-Asp-Pro-dNal(2')-Arg-Trp-Lys-dVal-dPro-NH_2
14	A2	Ac-Nle-Pro-dNal(2')-Arg-Trp-dVal-dPro-NH_2

[1677] Group D included non-naturally occurring melanocortin analogs D1 to D5, and known MC3R/MC4R antagonists B02 and B07, all of which are cyclic peptides comprising the motif Pro-dNal(2')-Arg-Trp, cyclized through a lactam bond between Asp and Lys, or a derivative thereof. The non-naturally occurring melanocortin analogs in Group D are derived from known MC3R/MC4R antagonist B07. Group D non-naturally occurring melanocortin analogs are provided in Table 3.

Table 3. Group D non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**
5	D1	Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
4	D3	Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
3	TCMCB07	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
2	D2	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro

[1678] Group E included non-naturally occurring melanocortin analogs E1 through E24, all of which are cyclic peptides comprising the motif Pro-dNal(2')-Arg-Trp, cyclized by a lactam bond between Asp and Lys, and a C-terminal dVal-dPro moiety. Group E non-naturally occurring melanocortin analogs are provided in Table 4.

Table 4. Group E non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring**	**Formula**

	melanocortin analog	
15	E1	Ac-dArg-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
16	E2	Ac-dMet-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
17	E3	Ac-dIle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
18	E4	Ac-dLeu-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
19	E5	Ac-dVal-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
20	E6	Ac-dAla-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
21	E7	Ac-Ala-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
22	E8	Ac-Tle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
23	E9	Ac-dTle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
24	E10	Ac-dNle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
25	E11	Ac-Nva-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
26	E12	Ac-Gly-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
27	E13	Ac-dPro-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
28	E14	Ac-dCys-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
29	E15	Ac-dPhe-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
30	E16	Ac-dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
31	E17	Ac-dGln-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
32	E18	Ac-dAsn-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
35	E19	dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
36	E20	Tyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
37	E21	Dmt-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
184	E22	Ac-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
185	E23	Ac-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
186	E24	Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2

[1679] Group F included non-naturally occurring melanocortin analogs F1 through F29, all of which are peptides cyclized through a bridge other than a bridge between Asp and Lys. Group F non-naturally occurring melanocortin analogs are provided in Table 5.

Table 5. Group F non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**
38	F1	Ac-Nle-c[dAsp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
39	F2	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dLys]-dVal-dPro-NH_2
40	F3	Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2
41	F4	Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2
42	F5	Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2
43	F22	Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2
48	F6	Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2
49	F7	Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2
50	F8	Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2
51	F9	Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2
52	F10	Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2
53	F11	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2
54	F12	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2
55	F13	Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2
59	F14	Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2
64	F15	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2
65	F16	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2
66	F17	Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2
67	F18	Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2

197	F19	c[CO-cis-CH=CH-CO-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
327	F20	Ac-dLeu-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2
328	F21	Ac-dNle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2
331	F22	Ac-dPhe-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2
344	F23	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dVal-dPro-NH_2
345	F24	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dVal-dPro-NH_2
346	F25	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dPro-NH_2
347	F26	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dPro-NH_2
348	F27	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dHyp-NH_2
349	F28	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dTle-dPro-NH_2
350	F29	Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Gly-dPen]-dVal-dPro-NH_2

[1680] Group G included non-naturally occurring melanocortin analogs G1 through G24, all of which are cyclic peptides comprising the motif R^3-dNal(2')-Arg-Trp, where R^3 is not Pro. Group G non-naturally occurring melanocortin analogs are provided in Table 6.

Table 6. Group G non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**

68	G1	Ac-Nle-c[Asp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
69	G2	Ac-Nle-c[Asp-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
71	G3	Ac-Nle-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
72	G4	Ac-Nle-c[Asp-dMet-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2
73	G5	Ac-Nle-c[Asp-Pro-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
74	G6	Ac-Nle-c[Asp-Gly-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
75	G7	Ac-Nle-c[Asp-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
76	G8	Ac-Nle-c[Asp-Leu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
77	G9	Ac-Nle-c[Asp-Ile-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
78	G10	Ac-Nle-c[Asp-Val-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
79	G11	Ac-Nle-c[Asp-dLeu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
80	G12	Ac-Nle-c[Asp-dIle-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
81	G13	Ac-Nle-c[Asp-dVal-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
82	G14	Ac-Nle-c[Asp-Trp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
240	G15	Ac-Nle-c[Asp-Cpe-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
241	G16	Ac-Nle-c[Asp-Che-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
242	G17	Ac-Nle-c[Asp-Oic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
244	G18	Ac-Nle-c[Asp-Tic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
199	G19	Ac-Nle-c[Asp-β-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
200	G20	Ac-Nle-c[Asp-Mamb-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
201	G21	Ac-Nle-c[Asp-Acpc-dNal(2') Arg-Trp-Lys]-dVal-dPro-NH_2

[1681] Group H included non-naturally occurring melanocortin analogs H1 through H15, all of which are cyclic peptides comprising the motif Pro-dNal(2')-R^5-Trp, where R^5 is not Arg. Group H non-naturally occurring melanocortin analogs are provided in Table 7.

Table 7. Group H non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring**	**Formula**

	melanocortin analog	
86	H1	Ac-Nle-c[Asp-Pro-dNal(2')-Trp-Lys]-dVal-dPro-NH_2
87	H2	Ac-Nle-c[Asp-Pro-dNal(2')-Lys-Trp-Lys]-dVal-dPro-NH_2
90	H3	Ac-Nle-c[Asp-Pro-dNal(2')-Orn-Trp-Lys]-dVal-dPro-NH_2
92	H4	Ac-Nle-c[Asp-Pro-dNal(2')-His-Trp-Lys]-dVal-dPro-NH_2
93	H5	Ac-Nle-c[Asp-Pro-dNal(2')-Ala-Trp-Lys]-dVal-dPro-NH_2
96	H6	Ac-Nle-c[Asp-Pro-dNal(2')-Glu-Trp-Lys]-dVal-dPro-NH_2

[1682] Group I included non-naturally occurring melanocortin analogs I1 through I13, all of which are cyclic peptides comprising the motif Pro-dNal(2')-Arg-R^6, where R^6 is not Trp. Group I non-naturally occurring melanocortin analogs are provided in Table 8.

Table 8. Group I non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**
102	I2	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Nal(1')-Lys]-dVal-dPro-NH_2
104	I3	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Phe-Lys]-dVal-dPro-NH2
105	I4	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Tyr-Lys]-dVal-dPro-NH_2
108	I5	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(1')-Lys]-dVal-dPro-NH_2
109	I6	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dPhe-Lys]-dVal-dPro-NH_2
110	I7	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(2')-Lys]-dVal-dPro-NH_2
111	I8	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTyr-Lys]-dVal-dPro-NH_2
196	I9	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTrp-Lys]-dVal-dPro-NH_2

[1683] Group J included non-naturally occurring melanocortin analogs J1 through J69, all of which are cyclic peptides comprising the motif Pro-dNal(2')-Arg-Trp, cyclized by a

lactam bond between Asp and Lys, and a C-terminus other than dVal-dPro-NH_2. Group J non-naturally occurring melanocortin analogs are provided in Table 9.

Table 9. Group J non-naturally occurring melanocortin analogs

SEQ ID NO	Non-naturally occurring melanocortin analog	Formula
115	J1	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Pro-NH_2
116	J2	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-OH
117	J3	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-OH
118	J4	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Hyp-NH_2
119	J5	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dHyp-NH_2
120	J6	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Hyp-NH_2
121	J7	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-dHyp-NH_2
122	J8	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-dVal-NH_2
123	J9	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-dVal-NH_2
124	J10	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-Val-NH_2
125	J11	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-Val-NH_2
126	J12	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-NH_2
127	J13	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-NH_2
128	J14	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-NH_2
129	J15	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-NH_2
130	J16	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-NH_2
131	J17	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Pro-NH_2
132	J18	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-NH_2
133	J19	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-NH_2
134	J20	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-NH_2
135	J21	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-NH_2
136	J22	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-dAla-NH_2

137	J23	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-Ala-NH_2
138	J24	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Gly-Gly-NH_2
139	J25	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asp-NH_2
140	J26	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Arg-NH_2
141	J27	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asn-NH_2
142	J28	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsp-NH_2
143	J29	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dArg-NH_2
144	J30	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsn-NH_2
145	J31	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-dPro-NH_2
146	J32	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-NH_2
147	J33	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-dPro-NH_2
148	J34	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-dPro-NH_2
149	J35	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-NH_2
150	J36	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-dPro-NH_2
151	J37	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-NH_2
152	J38	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-NH_2
153	J39	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-NH_2
154	J40	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-NH_2
155	J41	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-NH_2
156	J42	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-NH_2
157	J43	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Pro-Val-NH_2
158	J44	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2
159	J45	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-dVal-NH_2
160	J46	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-NH_2
161	J47	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-NH_2
162	J48	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Val-Pro-NH_2
164	J49	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2

164	J50	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2
165	J51	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Pro-Val-NH_2
166	J52	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-dVal-NH_2
167	J53	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-dVal-NH_2
168	J54	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Val-Pro-NH_2
169	J55	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dVal-dPro-NH_2
170	J56	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2
171	J57	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-dPro-NH_2
172	J58	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2
173	J59	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-NH_2
174	J60	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-NH_2
175	J61	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2
176	J62	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2
177	J63	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dTle-NH_2
178	J64	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dTle-NH_2
179	J65	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2
180	J66	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2
181	J67	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2

182	J68	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2
183	J69	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2
203	J70	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Trp-NH_2

[1684] Group K included non-naturally occurring melanocortin analogs K1 through K37, all of which are cyclic peptides comprising the motif Pro-p(X)dPhe-Arg-Trp, where X is Cl, I, Br, or CF_3, or a derivative thereof. Group K non-naturally occurring melanocortin analogs are provided in Table 10.

Table 10. Group K non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**
215	K1	Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
216	K2	Ac-Nle-c[Asp-Pro-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
217	K3	Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
219	K4	Ac-Nle-c[Asp-Pro-p(CF3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
221	K5	Ac-Nle-c[Asp-His-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
222	K6	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH2
224	K7	Ac-Nle-c[Asp-His-p(CF3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
509	K8	Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2
510	K9	Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2
525	K10	Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2

526	K11	Ac-Nle-c[Asp-dPhe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
527	K12	Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
531	K13	Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
533	K14	Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
534	K15	Ac-Nle-c[Asp-dTyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
535	K16	Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2
538	K17	Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
545	K18	Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
546	K19	Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2
547	K20	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2
548	K21	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2
549	K22	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2
551	K23	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2
552	K24	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
553	K25	Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
555	K26	Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
562	K27	Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
563	K28	Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
564	K29	Ac-Nle-c[Asp-dPhe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
565	K30	Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2

566	K31	Ac-Nle-c[Asp-dBip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
567	K32	Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
568	K33	Ac-Nle-c[Asp-dGln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
569	K34	Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
570	K35	Ac-Nle-c[Asp-dTrp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
571	K36	Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
572	K37	Ac-Nle-c[Asp-dTyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2

[1685] Group L included non-naturally occurring melanocortin analogs L1 through L3, all of which are cyclic peptides comprising the Pro at one or more of R^2, R^3, and R^7. Group L non-naturally occurring melanocortin analogs are provided in Table 11.

Table 11. Group L non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**
194	L1	Ac-Nle-c[Asp-Pro-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
195	L2	Ac-Nle-c[Asp-Trp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
245	L3	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2

[1686] Group M included non-naturally occurring melanocortin analogs M1 through M5, all of which are cyclic peptides comprising the motif Glu-dNal(2')-Arg-Trp or a derivative thereof. Group M non-naturally occurring melanocortin analogs are provided in Table 12.

Table 12. Group M non-naturally occurring melanocortin analogs

SEQ ID NO	Non-naturally occurring melanocortin analog	Formula
255	M1	Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
256	M2	Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2
257	M3	Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
264	M4	Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2
265	M5	Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH2

[1687] Group N included non-naturally occurring melanocortin analogs N7 through N11, all of which are cyclic peptides comprising the motif dNal(2')-Arg-Trp-Gly or a derivative thereof and/or a C-terminal dPro-dPro-Lys-Asp, or a derivative thereof. Group N non-naturally occurring melanocortin analogs are provided in Table 13.

Table 13. Group M non-naturally occurring melanocortin analogs

SEQ ID NO	Non-naturally occurring melanocortin analog	Formula
259	N7	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2
260	N8	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2
261	N9	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2

262	N10	Ac-Glu-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2
263	N11	Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-dLys-dAsp-NH_2

[1688] Group O included non-naturally occurring melanocortin analogs O1 through O8, all of which are cyclic peptides comprising the motif dAla-His-dNal(2')-Arg or a derivative thereof. The inclusion of dAla in Group O may promote and stabilize b-turns in the Group O peptides. Group O non-naturally occurring melanocortin analogs are provided in Table 14.

Table 14. Group N non-naturally occurring melanocortin analogs

SEQ ID NO	**Non-naturally occurring melanocortin analog**	**Formula**
266	O1	Ac-Nle-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
267	O2	Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
270	O3	Ac-dArg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
271	O4	Ac-Arg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
272	O5	Ac-dArg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
273	O6	Ac-Nle-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
274	O7	Ac-Arg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
275	O8	Ac-dArg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2
283	O9	Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-NH_2

[1689] Group P included non-naturally occurring melanocortin analog P1, which is a cyclic peptides comprising the motif dBip-dPhe-Arg-Trp. The group P non-naturally occurring melanocortin analog is provided in Table 15.

Table 15. Group P non-naturally occurring melanocortin analogs

SEQ ID NO	Non-naturally occurring melanocortin analog	Formula
369	P1	Ac-Nle-c[Asp-dBip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2

[1690] Group Q included non-naturally occurring melanocortin analogs Q1 to Q34, all of which are cyclic peptides comprising the motif His-p(X)dPhe-Arg-Trp or a derivative thereof. Further, group Q peptides have partial agonist activity on at least the MC4R. Group Q non-naturally occurring melanocortin analogs are provided in Table 16.

Table 16. Group Q non-naturally occurring melanocortin analogs

SEQ ID NO	Non-naturally occurring melanocortin analog	Formula
220	Q1	Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
514	Q2	Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
444	Q3	Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2
517	Q4	Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
445	Q5	Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2
516	Q6	Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2
426	Q7	Ac-Nle-c[Asp-Pro-dPhe-Lys-Trp-Lys]-dVal-dPro-NH_2

489	Q8	Ac-Nle-c[Asp-Bip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
493	Q9	Ac-Nle-c[Asp-Trp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
432	Q10	Ac-Nle-c[Cys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2
543	Q11	Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
539	Q12	Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
544	Q13	Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
561	Q14	Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
556	Q15	Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
542	Q16	Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
560	Q17	Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
430	Q18	Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2
559	Q19	Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
497	Q20	Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2
540	Q21	Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
431	Q22	Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2
554	Q23	Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2
500	Q24	Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
557	Q25	Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2
541	Q26	Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
550	Q27	Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2
558	Q28	Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2

524	Q29	Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
529	Q30	Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
508	Q31	Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2
495	Q32	Ac-Nle-c[Asp-Tyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
507	Q33	Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2
487	Q34	Ac-Nle-c[Asp-Phe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2

Agonist activity of melanocortin analogs on melanocortin 1 and 5 receptors

[1691] Administration of some non-naturally occurring melanocortin analogs activated melanocortin 1 receptor (MC1R) and/or melanocortin 5 receptor (MC5R) activity, as measured by cAMP levels (Table 17).

Table 17. Dose-response results of melanocortin agonist analogs and control against the melanocortin 1 receptor (MC1R) and melanocortin 5 receptor (MC5R)

SEQ ID NO	Compound ID	MC1R		MC5R	
		Max Activation (Emax)	EC50 (nM))	Max Activation (Emax)	EC50 (nM))
	NDP-α-MSH	101.06	0.039	101.44	0.12
2	D2	96.31	0.73	101.57	0.01
3	TCMCB07	95.95	0.28	103.61	0.01
4	D3	97.88	3.99	101.63	0.10
5	D1	99.94	7.53	98.90	9.46
13	A1	95.46	5.79	101.47	0.02
15	E1	88.63	24.88	103.52	0.03
16	E2	97.20	0.80	103.39	0.01
17	E3	97.94	0.46	104.07	0.04
18	E4	99.57	0.21	102.91	0.01

19	E5	98.27	1.50	104.56	0.05
20	E6	95.86	74.13	103.75	0.09
21	E7	105.43	168.51	102.72	0.28
22	E8	95.60	0.17	103.39	0.02
23	E9	91.47	31.31	103.10	0.08
24	E10	99.33	0.46	102.79	0.00
25	E11	93.11	0.66	103.26	0.00
26	E12	95.47	44.11	103.35	0.12
27	E13	86.47	75.48	103.49	0.30
28	E14	97.10	42.47	103.55	0.07
29	E15	99.01	12.40	103.87	0.08
30	E16	91.07	30.45	103.18	0.11
31	E17	93.89	312.99	103.65	1.20
32	E18	100.00	430.99	104.09	1.24
35	E19	91.88	16.62	103.96	0.14
36	E20	94.58	11.80	102.63	0.24
37	E21	92.72	30.88	103.43	0.21
38	F1	99.70	0.33	102.50	0.31
39	F2	100.32	7.98	103.72	0.09
40	F3	99.63	2.21	102.07	0.07
41	F4	102.66	0.04	102.70	0.00
42	F5	99.53	23.16	102.52	1.13
43	F22	100.33	0.08	101.61	0.01
48	F6	97.04	5.44	103.17	0.05
49	F7	100.75	0.11	102.39	0.02
50	F8	93.75	2.90	102.38	0.04
51	F9	105.06	196.86	102.63	1.14
52	F10	88.22	5.46	102.25	0.15
53	F11	102.10	0.42	102.26	0.02
54	F12	84.82	57.93	100.94	2.89

55	F13	100.90	60.13	99.70	2.80
59	F14	-	-	100.00	423.33
64	F15	98.21	0.09	103.29	0.00
65	F16	95.11	24.07	102.88	0.23
66	F17	94.11	0.08	102.78	0.00
67	F18	99.87	13.72	103.17	0.02
68	G1	96.09	22.74	99.63	24.19
69	G2	102.01	0.20	102.84	0.00
71	G3	95.83	13.38	101.88	7.52
72	G4	91.84	10.89	98.57	39.56
73	G5	100.00	380.03	100.00	158.96
74	G6	99.34	74.34	102.14	7.63
75	G7	102.68	1.57	105.00	0.05
76	G8	97.41	0.92	104.64	0.02
77	G9	99.20	0.50	103.07	0.01
78	G10	98.33	0.46	103.89	0.01
79	G11	97.99	1.47	82.88	65.69
80	G12	97.59	1.40	74.15	172.78
81	G13	99.80	1.07	92.10	24.61
82	G14	95.06	3.11	103.16	0.04
86	H1	100.00	758.17	98.85	0.35
87	H2	95.18	0.83	102.74	0.01
90	H3	93.02	16.71	100.73	0.08
92	H4	88.63	27.91	103.07	0.01
93	H5	85.20	9.01	100.34	0.11
96	H6	95.45	56.61	99.80	0.32
102	I2	96.13	0.64	103.61	0.02
104	I3	96.77	0.82	100.06	0.09
105	I4	93.37	4.68	99.45	0.39
108	I5	95.87	1.39	100.38	0.12

109	I6	95.15	1.09	103.04	0.02
110	I7	92.05	0.46	103.25	0.01
111	I8	91.43	13.26	103.61	0.04
115	J1	98.23	0.05	104.37	0.00
116	J2	96.77	0.47	104.22	0.01
117	J3	93.19	2.39	102.56	0.02
118	J4	96.29	0.09	103.25	0.00
119	J5	97.77	0.18	103.59	0.00
120	J6	94.70	0.30	103.44	0.00
121	J7	94.15	0.28	103.40	0.01
122	J8	89.89	2.85	103.28	0.01
123	J9	91.14	0.88	104.01	0.01
124	J10	92.05	2.74	102.59	0.01
125	J11	90.13	0.82	102.50	0.00
126	J12	95.69	0.45	103.09	0.01
127	J13	97.14	1.21	103.12	0.01
128	J14	95.31	0.58	101.63	0.01
129	J15	93.69	1.64	102.90	0.00
130	J16	96.70	0.29	103.30	0.01
131	J17	96.43	2.36	104.80	0.00
132	J18	98.77	0.34	103.26	0.00
133	J19	98.03	0.37	103.22	0.00
134	J20	94.55	1.62	103.03	0.01
135	J21	92.40	3.18	103.32	0.01
136	J22	97.09	0.48	103.70	0.00
137	J23	97.44	0.34	103.17	0.00
138	J24	98.09	0.39	103.17	0.00
139	J25	95.28	0.85	103.65	0.01
140	J26	96.33	0.12	103.41	0.00
141	J27	95.11	0.24	103.23	0.00

142	J28	96.77	0.73	103.32	0.01
143	J29	97.28	0.16	103.99	0.00
144	J30	96.49	0.42	103.30	0.00
145	J31	93.97	1.55	104.49	0.01
146	J32	96.45	0.13	102.78	0.00
147	J33	94.47	0.28	103.85	0.00
148	J34	95.01	0.93	103.56	0.00
149	J35	96.61	0.06	103.12	0.00
150	J36	97.67	0.10	102.22	0.00
151	J37	96.80	0.78	103.10	0.00
152	J38	97.24	0.07	102.79	0.00
153	J39	96.98	0.17	102.99	0.00
154	J40	93.43	4.02	101.79	0.03
155	J41	95.27	0.18	102.52	0.00
156	J42	94.50	1.00	101.21	0.02
157	J43	97.39	0.01	102.17	0.00
158	J44	96.36	0.09	102.53	0.00
159	J45	97.65	0.04	104.23	0.00
160	J46	95.28	0.17	103.48	0.00
161	J47	97.91	0.07	102.66	0.00
162	J48	96.46	0.10	103.38	0.00
164	J49	97.57	0.17	104.27	0.00
164	J50	98.83	0.13	103.50	0.00
165	J51	99.00	0.01	104.09	0.00
166	J52	95.54	0.08	103.39	0.00
167	J53	98.28	0.03	103.70	0.00
168	J54	96.04	0.10	103.81	0.00
169	J55	95.48	0.11	102.37	0.00
170	J56	95.04	0.11	103.27	0.00
171	J57	96.78	0.15	103.22	0.01

172	J58	96.27	0.24	103.64	0.01
173	J59	96.50	0.33	103.85	0.01
174	J60	97.11	0.55	103.59	0.02
175	J61	97.70	0.30	104.35	0.01
176	J62	96.18	1.50	104.90	0.07
177	J63	92.65	0.61	103.64	0.01
178	J64	94.72	0.51	103.47	0.01
179	J65	94.88	0.50	100.87	0.03
180	J66	91.47	1.05	100.75	0.03
181	J67	96.54	0.57	103.79	0.01
182	J68	96.25	0.17	103.60	0.01
183	J69	93.84	4.62	102.88	0.07
184	E22	98.12	0.70	103.19	0.01
185	E23	100.49	2.04	102.69	0.03
186	E24	99.56	14.51	103.55	0.21
194	L1	-	-	100.00	139.77
195	L2	100.00	224.70	102.01	9.00
196	I9	90.17	0.72	100.98	0.02
197	F19	100.00	454.57	98.75	19.64
199	G19	93.10	35.27	100.70	5.98
200	G20	100.00	976.21	39.99	290.06
201	G21	97.19	52.55	99.61	56.81
203	J70	95.69	0.45	104.08	0.01
215	K1	100.88	0.02	102.95	0.03
216	K2	96.98	0.02	101.67	0.02
217	K3	99.35	0.01	103.08	0.01
219	K4	90.36	0.14	103.05	0.01
221	K5	100.11	0.00	101.65	0.02
222	K6	100.43	0.00	101.22	0.03
224	K7	102.31	0.01	99.85	0.06

240	G15	96.98	4.47	100.95	7.11
241	G16	102.09	0.62	100.08	2.57
242	G17	59.99	4.92	99.72	0.11
244	G18	101.49	0.20	102.97	0.01
245	L3	95.48	36.40	98.57	1.68
255	M1	99.10	3.43	100.28	0.20
256	M2	95.79	0.87	101.77	0.03
257	M3	-	-	100.00	525.23
259	N7	99.33	0.01	101.48	0.01
260	N8	100.89	0.02	101.87	0.00
261	N9	101.72	0.02	101.29	0.00
262	N10	100.00	332.49	99.90	0.21
263	N11	98.63	0.38	101.63	0.01
264	M4	98.65	19.78	102.52	79.51
265	M5	97.43	0.62	101.18	5.27
266	O1	99.44	0.04	100.25	0.20
267	O2	98.97	0.40	100.94	8.42
270	O3	100.09	1.06	99.51	7.04
271	O4	-	-	103.14	1124.67
272	O5	97.20	76.01	37.00	571.95
273	O6	100.48	1.28	101.62	5.44
274	O7	99.09	1.55	100.21	4.36
275	O8	98.40	1.53	101.20	1.29
327	F20	100.38	12.99	100.88	0.29
328	F21	84.46	205.01	99.62	2.32
331	F22	103.65	26.09	102.19	11.02
344	F23	99.46	43.15	101.56	2.62
345	F24	96.17	653.63	102.25	2.59
346	F25	87.39	1030.85	102.85	0.44
347	F26	93.98	44.60	100.37	0.91

348	F27	100.00	343.17	102.25	2.17
349	F28	100.00	280.40	99.57	2.71
350	F29	99.89	33.67	100.40	0.79
369	P1	91.97	8.82	87.36	107.71
509	K8	101.20	0.02	100.91	0.10
510	K9	101.89	0.02	98.82	0.12
525	K10	100.41	0.07	101.50	0.22
526	K11	90.28	7.37	93.75	26.03
527	K12	99.26	1.66	100.17	2.40
531	K13	102.51	0.10	102.91	0.16
533	K14	103.32	0.02	101.45	0.10
534	K15	96.83	35.06	99.84	104.21
535	K16	101.54	0.00	100.44	0.01
538	K17	102.09	0.02	103.03	0.06
545	K18	100.42	0.01	100.10	0.02
546	K19	103.89	0.04	101.92	0.15
547	K20	103.54	0.02	98.38	0.29
548	K21	99.27	0.02	97.09	0.12
549	K22	100.56	0.03	100.10	0.19
551	K23	101.34	0.01	99.59	0.07
552	K24	101.56	0.00	101.88	0.01
553	K25	101.95	0.01	100.18	0.02
555	K26	99.52	0.01	102.96	0.06
562	K27	101.28	0.21	99.46	1.02
563	K28	101.20	0.07	100.54	0.40
564	K29	97.54	3.52	91.83	24.99
565	K30	106.84	4.88	102.30	7.30
566	K31	77.91	27.34	95.54	154.76
567	K32	100.91	0.03	102.32	0.01
568	K33	99.23	31.46	93.82	43.77

569	K34	100.18	0.12	100.70	0.18
570	K35	93.95	20.06	93.84	60.66
571	K36	103.63	0.01	98.56	0.08
572	K37	100.62	5.50	99.12	42.45
283	O9	98.41	1.72	100.08	6.63
220	Q1	101.22	0.00	101.47	0.03
514	Q2	102.73	0.00	103.37	0.01
444	Q3	102.11	0.01	103.58	0.01
517	Q4	102.86	0.02	103.76	0.14
445	Q5	102.02	0.00	102.64	0.00
516	Q6	99.84	0.01	100.72	0.02
426	Q7	101.96	0.31	101.23	2.39
489	Q8	100.87	1.55	101.36	0.49
493	Q9	101.00	0.16	102.02	0.15
432	Q10	101.71	0.18	104.85	0.04
543	Q11	101.21	0.01	100.71	0.14
539	Q12	101.49	0.01	102.16	0.08
544	Q13	100.70	0.02	103.41	0.41
561	Q14	101.45	0.04	104.71	0.77
556	Q15	101.10	0.01	102.71	0.07
542	Q16	102.15	0.02	103.72	0.30
560	Q17	102.87	0.02	102.37	0.28
430	Q18	101.43	0.11	102.05	0.28
559	Q19	100.57	0.02	104.22	0.25
497	Q20	102.89	0.00	102.90	0.01
540	Q21	100.94	0.01	100.13	0.06
431	Q22	102.16	0.01	101.31	0.03
554	Q23	103.56	0.01	101.20	0.17
500	Q24	101.99	0.02	102.59	0.13
557	Q25	102.10	0.01	98.96	0.06

541	Q26	102.66	0.01	101.17	0.07
550	Q27	103.93	0.01	100.50	0.12
558	Q28	101.47	0.01	101.65	0.09
524	Q29	102.26	0.31	100.49	3.66
529	Q30	103.88	0.01	103.00	0.03
508	Q31	101.09	0.05	101.42	0.13
495	Q32	102.38	0.02	102.23	0.05
507	Q33	102.80	0.00	103.08	0.00
487	Q34	100.87	0.07	100.51	0.12

Agonist activity of melanocortin analogs on melanocortin 3 receptor and melanocortin 4 receptor

[1692] Administration of some non-naturally occurring melanocortin analogs activated melanocortin 3 receptor (MC3R) activity and/or melanocortin 4 receptor (MC4R) activity, as measured by cAMP levels (Table 18).

Table 18. Dose-response results of melanocortin agonist analogs and control against the melanocortin 3 receptor (MC3R) and melanocortin 4 receptor (MC4R)

SEQ ID NO	Compound ID	MC3R		MC4R	
		Max Activation (Emax)	EC50 (nM)	Max Activation (Emax)	EC50 (nM)
215	K1	-	-	24.29	39.43
222	K6	-	-	37.78	1.00
265	M5	-	-	35.36	23.18
266	O1	-	-	32.94	3.80
267	O2	-	-	21.53	17.93
327	F20	-	-	26.98	405.80
369	P1	-	-	59.26	7.46
509	K8	-	-	41.53	3.20
510	K9	-	-	39.78	4.00

535	K16	-	-	39.25	0.85
538	K17	-	-	29.49	1.71
545	K18	-	-	29.79	3.26
551	K23	-	-	41.85	3.11
552	K24	-	-	21.58	0.95
553	K25	-	-	29.09	6.49
555	K26	-	-	24.99	1.21
567	K32	-	-	32.95	3.80
220	Q1	43.20	0.22	75.31	0.61
514	Q2	45.86	0.21	77.31	0.09
444	Q3	24.72	7.94	65.98	0.62
517	Q4	20.80	0.30	78.36	0.12
445	Q5	-	-	80.58	0.07
516	Q6	36.63	0.21	83.97	1.24
426	Q7	-	-	71.23	27.73
489	Q8	-	-	68.49	23.13
493	Q9	-	-	70.82	5.02
432	Q10	-	-	75.44	1.89
543	Q11	-	-	74.70	0.84
539	Q12	-	-	65.32	0.58
544	Q13	-	-	79.56	0.94
561	Q14	-	-	83.76	1.40
556	Q15	-	-	66.02	0.50
542	Q16	-	-	73.14	0.89
560	Q17	-	-	81.84	1.07
430	Q18	-	-	71.25	6.59
559	Q19	-	-	70.77	0.79
497	Q20	-	-	74.84	0.41
540	Q21	-	-	66.16	0.48
431	Q22	20.20	0.25	84.89	0.09

554	Q23	-	-	45.81	7.36
500	Q24	-	-	70.05	1.30
557	Q25	-	-	66.37	0.46
541	Q26	23.63	1.34	68.88	0.94
550	Q27	-	-	35.42	6.15
558	Q28	25.11	0.64	69.22	0.74
524	Q29	-	-	59.66	71.16
529	Q30	-	-	71.54	5.97
508	Q31	21.93	6.09	44.12	13.56
495	Q32	-	-	71.44	1.45
507	Q33	30.23	0.98	75.16	1.56
487	Q34	-	-	83.45	1.86

Antagonist activity of melanocortin analogs on melanocortin 3 receptor and melanocortin 4 receptor

[1693] Administration of some non-naturally occurring melanocortin analogs inhibited melanocortin 3 receptor (MC3R) and/or melanocortin 4 receptor (MC4R) activity, as measured by cAMP levels. (Table 19).

Table 19. Dose-response results of melanocortin analogs and control against the melanocortin 3 receptor (MC3R) and the melanocortin 4 receptor (4)

SEQ ID NO	Compound ID	MC3R		MC4R	
		Max Activation (Emax)	EC50 (nM))	Max Activation (Emax)	EC50 (nM))
	SHU9119	97.24	2.34	98.58	2.56
2	D2	105.27	7.31	102.82	12.08
3	TCMCB07	95.47	3.10	98.32	5.24
4	D3	105.74	17.01	109.84	38.30
5	D1	94.38	67.67	94.98	44.21
13	A1	94.81	17.19	94.30	16.42

15	E1	91.17	4.03	93.53	1.08
16	E2	91.50	3.99	93.68	3.12
17	E3	97.82	6.61	100.54	5.16
18	E4	98.08	1.40	95.36	2.85
19	E5	94.26	3.95	96.89	3.07
20	E6	93.59	6.60	94.94	2.47
21	E7	96.66	8.32	107.98	6.59
22	E8	96.27	2.83	96.31	2.34
23	E9	100.58	14.70	98.92	6.03
24	E10	94.02	2.07	94.65	2.71
25	E11	99.35	3.21	99.95	2.88
26	E12	100.06	17.47	97.13	3.36
27	E13	95.27	20.92	96.83	7.71
28	E14	101.70	46.53	96.81	18.77
29	E15	101.39	5.97	95.42	8.92
30	E16	97.81	14.49	96.13	5.61
31	E17	97.02	78.47	103.78	11.20
32	E18	99.28	66.75	100.11	11.10
35	E19	92.89	9.18	89.75	3.24
36	E20	95.35	3.08	106.67	4.24
37	E21	100.08	3.63	98.68	2.76
38	F1	93.32	101.21	87.59	29.19
39	F2	95.72	75.06	94.01	13.73
40	F3	104.56	8.53	103.17	14.00
41	F4	98.84	1.55	97.03	3.60
42	F5	100.00	271.72	94.78	112.58
43	F22	101.53	2.81	97.40	1.92
48	F6	93.99	12.79	97.55	7.35
49	F7	99.23	3.22	93.19	5.57
50	F8	97.68	11.28	98.74	9.49

51	F9	100.00	729.52	96.10	58.92
52	F10	101.69	31.72	97.32	10.81
53	F11	101.22	3.93	96.53	8.27
54	F12	-	-	86.35	112.95
55	F13	-	-	100.00	507.42
59	F14	-	-	104.76	68.37
64	F15	98.62	1.25	99.24	1.65
65	F16	100.00	216.03	93.33	11.61
66	F17	98.52	1.17	97.31	2.03
67	F18	100.17	90.33	97.02	10.41
68	G1	95.81	40.98	99.30	19.63
69	G2	99.54	4.29	90.30	933.82
71	G3	100.00	1641.51	105.74	83.94
72	G4	-	-	102.25	152.53
73	G5	105.75	168.62	110.56	123.38
74	G6	100.00	312.36	95.73	54.05
75	G7	92.51	34.73	92.97	14.28
76	G8	101.51	18.49	96.36	9.58
77	G9	97.43	13.24	97.18	8.11
78	G10	94.78	6.65	95.55	4.45
79	G11	-	-	85.55	208.65
80	G12	100.00	1807.47	100.00	1935.51
81	G13	100.00	2167.25	106.60	408.95
82	G14	95.44	13.33	100.99	15.48
86	H1	100.83	95.42	100.84	165.58
87	H2	96.02	5.26	97.93	4.24
90	H3	101.01	67.54	100.43	12.16
92	H4	97.14	10.74	98.29	12.64
93	H5	106.93	92.45	97.34	36.07
96	H6	100.00	639.48	83.47	151.88

102	I2	94.09	5.96	98.27	6.69
104	I3	98.10	4.06	105.52	10.98
105	I4	100.76	38.65	104.42	39.30
108	I5	101.32	17.88	100.10	26.88
109	I6	98.99	3.47	96.75	7.09
110	I7	94.39	2.29	99.05	3.99
111	I8	103.94	23.77	101.51	54.67
115	J1	97.37	3.09	99.35	3.85
116	J2	96.36	6.34	94.94	9.80
117	J3	95.97	56.21	94.85	8.22
118	J4	93.21	1.37	102.17	3.00
119	J5	98.95	2.16	97.74	3.81
120	J6	95.65	6.72	97.15	2.21
121	J7	102.23	10.45	100.73	2.07
122	J8	99.36	9.70	97.12	1.68
123	J9	96.57	7.04	105.30	2.04
124	J10	98.62	8.64	99.66	2.08
125	J11	94.37	1.89	98.87	2.01
126	J12	102.19	4.49	99.31	3.83
127	J13	98.95	13.54	100.70	2.55
128	J14	104.82	2.95	112.10	5.16
129	J15	99.49	13.29	95.37	1.84
130	J16	94.67	2.57	95.18	2.04
131	J17	93.31	7.90	90.58	1.60
132	J18	92.09	3.04	93.48	2.20
133	J19	92.89	3.85	95.00	2.06
134	J20	94.43	14.02	100.30	2.75
135	J21	91.90	12.36	95.69	1.69
136	J22	94.98	4.40	96.39	2.24
137	J23	100.52	2.57	96.13	2.03

138	J24	98.32	3.04	98.22	1.63
139	J25	97.03	6.82	97.66	6.93
140	J26	96.08	1.14	97.63	1.27
141	J27	98.30	2.13	99.33	2.60
142	J28	97.64	9.27	102.04	8.16
143	J29	97.95	1.36	94.87	1.24
144	J30	98.80	3.46	97.42	2.87
145	J31	103.00	15.96	95.18	6.20
146	J32	98.49	2.26	98.98	1.08
147	J33	94.95	1.81	92.72	1.64
148	J34	95.53	5.19	95.06	4.41
149	J35	96.48	0.65	96.05	0.89
150	J36	97.84	1.52	98.91	1.55
151	J37	94.74	4.84	101.46	4.70
152	J38	98.36	0.80	97.84	0.61
153	J39	99.69	1.07	97.95	1.25
154	J40	96.00	9.77	103.42	10.81
155	J41	96.93	1.23	98.29	0.68
156	J42	97.82	4.34	99.12	4.89
157	J43	96.39	0.51	97.69	1.08
158	J44	98.84	1.83	99.35	1.66
159	J45	96.32	0.96	96.80	1.10
160	J46	97.22	2.37	98.02	1.19
161	J47	97.54	1.02	94.97	1.25
162	J48	97.31	0.66	98.14	1.37
164	J49	92.71	1.55	88.48	2.12
164	J50	97.50	3.19	96.73	2.02
165	J51	94.57	0.78	96.73	1.43
166	J52	93.77	2.36	97.31	2.90
167	J53	99.60	1.15	93.21	1.87

168	J54	100.64	1.96	98.27	2.07
169	J55	99.50	1.65	96.71	1.95
170	J56	94.42	2.03	99.60	1.84
171	J57	99.49	5.54	97.42	6.03
172	J58	99.29	5.72	99.63	5.35
173	J59	93.94	5.36	96.52	6.38
174	J60	98.91	12.75	100.09	13.22
175	J61	96.60	6.95	97.37	7.09
176	J62	91.37	31.30	102.23	54.01
177	J63	100.20	20.10	93.22	4.92
178	J64	100.97	7.02	96.62	8.21
179	J65	97.93	3.35	105.20	9.12
180	J66	93.29	14.15	100.96	4.73
181	J67	95.68	7.40	91.75	9.28
182	J68	98.93	5.84	96.16	9.43
183	J69	69.04	49.77	93.02	236.19
184	E22	100.30	9.54	98.14	11.65
185	E23	96.10	22.35	90.04	26.56
186	E24	110.34	230.13	90.61	120.39
194	L1	-	-	82.02	87.61
195	L2	100.00	621.95	103.45	197.06
196	I9	98.09	2.35	94.83	3.39
197	F19	100.00	493.82	98.24	18.13
199	G19	90.28	247.34	109.86	11.42
200	G20	100.00	796.21	110.22	88.81
201	G21	-	-	97.56	266.30
203	J70	96.41	10.01	97.62	8.59
215	K1	90.46	1.98	61.06	4.59
216	K2	103.39	1.70	100.79	3.27
217	K3	97.22	0.50	91.13	1.66

219	K4	97.89	1.00	101.12	2.35
221	K5	97.53	0.77	92.93	3.42
222	K6	75.13	1.50	61.94	52.26
224	K7	92.12	2.82	92.28	8.79
240	G15	100.00	888.13	106.26	134.89
241	G16	100.00	313.23	114.47	149.56
242	G17	107.16	20.13	106.34	23.35
244	G18	99.81	12.73	97.48	16.04
245	L3	100.00	109.10	119.32	247.97
255	M1	100.00	117.01	119.19	124.74
256	M2	98.28	26.33	98.51	36.86
257	M3	-	-	100.00	1084.98
259	N7	98.57	1.89	96.76	4.60
260	N8	90.76	1.17	97.05	4.76
261	N9	96.17	1.28	98.98	4.77
262	N10	88.88	118.02	96.70	35.01
263	N11	96.76	18.87	102.32	4.44
264	M4	100.00	637.44	100.00	394.01
265	M5	90.43	84.03	62.45	35.83
266	O1	85.30	16.76	57.56	10.30
267	O2	92.56	39.24	79.43	20.31
270	O3	102.85	67.71	92.18	28.04
271	O4	-	-	100.00	901.47
272	O5	-	-	100.00	826.22
273	O6	95.87	50.52	99.56	22.74
274	O7	100.98	20.27	104.62	10.49
275	O8	103.09	30.98	98.39	9.39
327	F20	94.97	147.83	75.54	11.71
328	F21	-	-	85.50	204.68
331	F22	100.00	917.17	82.21	161.09

344	F23	-	-	95.91	145.67
345	F24	-	-	84.40	77.78
346	F25	-	-	85.47	31.99
347	F26	-	-	88.67	29.48
348	F27	-	-	100.00	211.47
349	F28	-	-	100.00	218.98
350	F29	-	-	97.84	150.22
369	P1	-	-	100.00	945.29
509	K8	71.29	3.41	50.37	9.87
510	K9	83.96	5.33	47.26	13.14
525	K10	97.30	9.91	82.12	10.08
526	K11	-	-	100.00	823.04
527	K12	88.70	52.80	100.00	140.06
531	K13	91.24	7.32	73.55	12.43
533	K14	87.81	2.15	81.28	11.73
534	K15	100.00	1438.23	100.00	384.00
535	K16	94.66	1.93	51.81	1.66
538	K17	97.85	3.15	64.79	5.39
545	K18	89.21	3.03	61.53	10.83
546	K19	81.31	6.99	62.44	26.12
547	K20	91.57	3.94	70.68	16.37
548	K21	97.74	6.76	80.30	13.40
549	K22	88.53	25.84	62.06	88.43
551	K23	86.51	8.24	49.02	11.72
552	K24	96.09	1.45	78.18	7.48
553	K25	94.14	4.00	64.97	14.05
555	K26	100.30	3.86	68.27	4.32
562	K27	95.31	196.06	100.00	864.71
563	K28	91.79	6.92	91.85	22.41
564	K29	-	-	100.00	437.33

565	K30	100.00	244.48	100.00	340.03
566	K31	-	-	100.00	827.67
567	K32	102.07	7.11	63.42	13.93
568	K33	100.00	517.39	83.30	239.04
569	K34	91.71	4.53	99.51	18.29
570	K35	-	-	100.00	546.37
571	K36	86.43	1.97	87.71	6.19
572	K37	100.00	402.71	103.05	115.76
283	O9	93.32	144.71	72.93	24.60
220	Q1	44.25	1.23	26.53	221.37
514	Q2	71.58	2.29	35.96	2.96
444	Q3	89.21	7.08	38.04	2.73
517	Q4	89.85	6.29	32.56	2.77
445	Q5	101.61	7.12	20.59	1.14
516	Q6	64.55	5.37	-	-
426	Q7	100.00	601.63	-	-
489	Q8	100.00	239.85	-	-
493	Q9	100.00	174.22	-	-
432	Q10	100.00	20.72	-	-
543	Q11	99.25	9.58	-	-
539	Q12	97.23	2.89	-	-
544	Q13	96.62	9.87	-	-
561	Q14	93.89	26.33	-	-
556	Q15	93.85	4.63	-	-
542	Q16	90.80	8.13	-	-
560	Q17	90.48	13.59	-	-
430	Q18	90.22	36.37	-	-
559	Q19	89.91	10.64	-	-
497	Q20	89.53	2.34	-	-
540	Q21	86.81	1.26	-	-

431	Q22	86.15	15.42	-	-
554	Q23	84.20	7.26	-	-
500	Q24	84.15	3.95	-	-
557	Q25	84.02	2.08	-	-
541	Q26	82.79	2.46	-	-
550	Q27	82.02	3.88	-	-
558	Q28	77.54	3.72	-	-
524	Q29	75.73	95.61	-	-
529	Q30	73.53	4.56	-	-
508	Q31	71.93	8.81	-	-
495	Q32	65.84	13.25	-	-
507	Q33	63.15	1.36	-	-
487	Q34	62.60	52.05	-	-

Additional Embodiments

[1694] Various embodiments of the present technology are set forth below in paragraphs [1695] to [3223]:

[1695] 1. A method of increasing body weight in a subject in need thereof, comprising administering to the subject

[1696] a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1697] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1698] wherein:

[1699] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1700] X^2 is absent, phenylalanine (Phe), or Nle;

[1701] X^3 is absent, Phe, or Nle;

[1702] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1703] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1704] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1705] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1706] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1707] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1708] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1709] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1710] R^9 is absent or Lys;

[1711] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1712] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1713] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1714] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1715] Y^5 is absent or dVal;

[1716] Y^6 is absent or dVal;

[1717] Y^7 is absent or dPro; and

[1718] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1719] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1720] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1721] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1722] provided that:

[1723] when R^3 is dTrp or Phe, then R4 is not dNal(2') and R6 is not dPhe;

[1724] when R4 is p(F)dPhe, then (i) R3 is selected from Phe, Bip, Trp, and Tyr or (ii) R3 is Pro and R5 is Lys, R6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R2 and Cys at R7;

[1725] when R4 is dPhe, then (i) R3 is dBip or (ii) R3 is Pro, R2 is not Trp, and either R5 is Lys or R6 is dNal(2') or Nal(2');

[1726] when R4 is p(Cl)dPhe, then R1 is Nle or Ala, R3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R2 is not Trp, Y4-Y7 are absent, and either X1 and Y3 are both present or X1 and Y3 are both absent;

[1727] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R2 and R7, then (i) R3 is Pro, (ii) R3 is His and R2 and R7 are both Cys, or (iii) R3 is absent, R2 is Pen, and R7 is dCys; and

[1728] when R7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1729] 2. Use of a non-naturally occurring melanocortin analog for increasing body weight in a subject in need thereof, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1730] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1731] wherein:

[1732] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1733] X^2 is absent, phenylalanine (Phe), or Nle;

[1734] X^3 is absent, Phe, or Nle;

[1735] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine

(dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1736] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1737] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1738] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1739] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1740] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1741] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1742] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1743] R^9 is absent or Lys;

[1744] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1745] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1746] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1747] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1748] Y^5 is absent or dVal;

[1749] Y^6 is absent or dVal;

[1750] Y^7 is absent or dPro; and

[1751] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1752] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1753] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1754] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1755] provided that:

[1756] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1757] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1758] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1759] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1760] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1761] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1762] 3. The method or the use of embodiment 1 or 2, wherein the method further comprises reducing lean mass loss, maintaining lean mass, or promoting lean mass gain in the subject.

[1763] 4. The method of the use of embodiment 3, wherein the lean mass is lean muscle mass.

[1764] 5. The method or the use of any one of embodiments 1 to 4, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.5 mg/kg to about 10 mg/kg per body weight of the subject once daily.

[1765] 6. The method or the use of embodiment 5, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 1 mg/kg or 3 mg/kg per body weight of the subject once daily.

[1766] 7. The method or the use of any one of embodiments 1 to 4, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.1 mg to about 100 mg once daily.

[1767] 8. The method or the use of any one of embodiments 1 to 4, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg or about 50 mg once daily.

[1768] 9. The method or the use of any one of embodiments 1 to 6, wherein the non-naturally occurring melanocortin analog is an antagonist of a melanocortin 4 receptor.

[1769] 10. The method or the use of embodiment 9, wherein the non-naturally occurring melanocortin analog is a full antagonist of the melanocortin 4 receptor.

[1770] 11. The method or the use of embodiment 9, wherein the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 4 receptor.

[1771] 11. The method or the use of embodiment 9, wherein the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 4 receptor.

[1772] 12. The method or the use of any one of embodiments 1 to 11, wherein the non-naturally occurring melanocortin analog is an antagonist of a melanocortin 3 receptor.

[1773] 13. The method or the use of embodiment 12, wherein the non-naturally occurring melanocortin analog is a full antagonist of the melanocortin 3 receptor.

[1774] 14. The method or the use of embodiment 12, wherein the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 3 receptor.

[1775] 15. The method or the use of any one of embodiments 1 to 11, wherein the non-naturally occurring melanocortin analog is an agonist of the melanocortin 3 receptor.

[1776] 16. The method or the use of embodiment 15, wherein the non-naturally occurring melanocortin analog is a full agonist of the melanocortin 3 receptor.

[1777] 17. The method or the use of embodiment 15, wherein the non-naturally occurring melanocortin analog is a partial agonist of the melanocortin 3 receptor.

[1778] 18. The method or the use of embodiment 15, wherein the non-naturally occurring melanocortin analog has no melanocortin 3 receptor activity.

[1779] 19. The method or the use of any one of embodiments 1 to 18, wherein the method or the use further comprises preventing or reducing one or more side effects associated with a metabolic disorder, relative to a control.

[1780] 20. A method of preventing or reducing cachexia in a subject in need thereof relative to a control, comprising administering to the subject:

[1781] a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1782] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1783] wherein:

[1784] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1785] X^2 is absent, phenylalanine (Phe), or Nle;

[1786] X^3 is absent, Phe, or Nle;

[1787] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1788] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1789] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one

(Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1790] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine ($p(CF_3)$dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1791] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1792] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1793] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1794] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1795] R^9 is absent or Lys;

[1796] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1797] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1798] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1799] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1800] Y^5 is absent or dVal;

[1801] Y^6 is absent or dVal;

[1802] Y^7 is absent or dPro; and

[1803] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1804] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1805] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1806] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1807] provided that:

[1808] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1809] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1810] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1811] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1812] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1813] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1814] 21. Use of a non-naturally occurring melanocortin analog for preventing or reducing cachexia in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1815] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1816] wherein:

[1817] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1818] X^2 is absent, phenylalanine (Phe), or Nle;

[1819] X^3 is absent, Phe, or Nle;

[1820] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1821] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1822] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic

acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1823] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1824] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1825] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1826] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1827] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1828] R^9 is absent or Lys;

[1829] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1830] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1831] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1832] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1833] Y^5 is absent or dVal;

[1834] Y^6 is absent or dVal;

[1835] Y^7 is absent or dPro; and

[1836] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1837] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1838] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1839] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1840] provided that:

[1841] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1842] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1843] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1844] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1845] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1846] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1847] 22. A method of preventing or reducing anorexia in a subject in need thereof relative to a control, comprising administering to the subject:

[1848] a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1849] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1850] wherein:

[1851] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1852] X^2 is absent, phenylalanine (Phe), or Nle;

[1853] X^3 is absent, Phe, or Nle;

[1854] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1855] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1856] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic

acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1857] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1858] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1859] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1860] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1861] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1862] R^9 is absent or Lys;

[1863] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1864] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1865] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1866] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1867] Y^5 is absent or dVal;

[1868] Y^6 is absent or dVal;

[1869] Y^7 is absent or dPro; and

[1870] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1871] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1872] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1873] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1874] provided that:

[1875] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1876] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1877] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1878] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1879] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1880] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1881] 23. Use of a non-naturally occurring melanocortin analog for preventing or reducing anorexia in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1882] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1883] wherein:

[1884] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1885] X^2 is absent, phenylalanine (Phe), or Nle;

[1886] X^3 is absent, Phe, or Nle;

[1887] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1888] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1889] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1890] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1891] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1892] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1893] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1894] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1895] R^9 is absent or Lys;

[1896] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1897] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1898] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1899] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1900] Y^5 is absent or dVal;

[1901] Y^6 is absent or dVal;

[1902] Y^7 is absent or dPro; and

[1903] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1904] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1905] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1906] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1907] provided that:

[1908] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1909] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1910] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1911] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1912] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1913] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1914] 24. A method of increasing, maintaining, or reducing a loss in a body mass index (BMI) level in a subject in need thereof relative to a control, comprising administering to the subject:

[1915] a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1916] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1917] wherein:

[1918] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1919] X^2 is absent, phenylalanine (Phe), or Nle;

[1920] X^3 is absent, Phe, or Nle;

[1921] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1922] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1923] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1924] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1925] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1926] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1927] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1928] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1929] R^9 is absent or Lys;

[1930] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1931] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1932] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1933] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1934] Y^5 is absent or dVal;

[1935] Y^6 is absent or dVal;

[1936] Y^7 is absent or dPro; and

[1937] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1938] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1939] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1940] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1941] provided that:

[1942] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1943] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1944] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1945] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1946] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1947] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1948] 25. Use of a non-naturally occurring melanocortin analog for increasing, maintaining, or reducing a loss in a BMI level in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

[1949] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1950] wherein:

[1951] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1952] X^2 is absent, phenylalanine (Phe), or Nle;

[1953] X^3 is absent, Phe, or Nle;

[1954] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1955] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1956] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1957] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1958] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1959] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1960] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1961] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1962] R^9 is absent or Lys;

[1963] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[1964] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[1965] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[1966] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[1967] Y^5 is absent or dVal;

[1968] Y^6 is absent or dVal;

[1969] Y^7 is absent or dPro; and

[1970] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[1971] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[1972] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[1973] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[1974] provided that:

[1975] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[1976] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[1977] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[1978] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[1979] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[1980] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[1981] 26. The method or the use of any one of embodiments 1-25, wherein the method or the use prevents fat mass gain after administration of the non-naturally occurring melanocortin analog, relative to a control.

[1982] 27. The method or the use of any one of embodiments 1-26, wherein the method or the use reduces increases a fat mass level after administration of the non-naturally occurring melanocortin analog, relative to a control.

[1983] 28. The method or the use of any one of embodiments 1-27, wherein the method or the use maintains or increases brain mass in the subject during or after administration of the non-naturally occurring melanocortin analog, relative to a control.

[1984] 29. The method or the use of any one of embodiments 1-27, wherein the method or the use prevents or reduces brain mass loss in the subject during or after administration of the non-naturally occurring melanocortin analog, relative to a control.

[1985] 30. The method or the use of any one of embodiments 1-29, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (I):

[1986] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

[1987] wherein:

[1988] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[1989] X^2 is absent, phenylalanine (Phe), or Nle;

[1990] X^3 is absent, Phe, or Nle;

[1991] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

[1992] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[1993] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc),

7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[1994] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[1995] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[1996] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[1997] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[1998] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[1999] R^9 is absent or Lys;

[2000] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2001] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2002] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2003] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2004] Y^5 is absent or dVal;

[2005] Y^6 is absent or dVal;

[2006] Y^7 is absent or dPro; and

[2007] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2008] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2009] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[2010] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2011] provided that:

[2012] when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

[2013] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[2014] when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

[2015] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

[2016] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[2017] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[2018] 31. The method or the use of any one of embodiments 1-29, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (I), wherein:

[2019] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2020] X^2 is absent, phenylalanine (Phe), or Nle;

[2021] X^3 is absent, Phe, or Nle;

[2022] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2023] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[2024] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[2025] R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[2026] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[2027] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2028] R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2029] R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

[2030] R^9 is absent or Lys;

[2031] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2032] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2033] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2034] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2035] Y^5 is absent or dVal;

[2036] Y^6 is absent or dVal;

[2037] Y^7 is absent or dPro; and

[2038] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2039] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2040] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[2041] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2042] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[2043] Ac-Nle-c[Asp-dTrp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 83);

[2044] Ac-Nle-c[Asp-Phe-Phe-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 420);

[2045] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 223);

[2046] Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 460);

[2047] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 464);

[2048] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 465);

[2049] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 466);

[2050] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 467);

[2051] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 468);

[2052] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 469);

[2053] Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 470);

[2054] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 474);

[2055] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 475);

[2056] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 476);

[2057] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 477);

[2058] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 478);

[2059] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 481);

[2060] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 482);

[2061] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 483);

[2062] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 484);

[2063] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 485);

[2064] Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 459);

[2065] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 472);

[2066] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 471);

[2067] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 463);

[2068] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 462);

[2069] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 479);

[2070] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 473);

[2071] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 480);

[2072] Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 486);

[2073] Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 491);

[2074] Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 461);

[2075] Ac-Nle-c[Asp-dGln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 492);

[2076] Ac-Nle-c[Asp-dTyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 496);

[2077] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 218);

[2078] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 442);

[2079] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 449);

[2080] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 455);

[2081] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 447);

[2082] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 438);

[2083] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 450);

[2084] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 435);

[2085] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 439);

[2086] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 441);

[2087] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 436);

[2088] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 454);

[2089] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 452);

[2090] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 451);

[2091] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 456);

[2092] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 437);

[2093] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 440);

[2094] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 448);

[2095] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 457);

[2096] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 453);

[2097] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 458);

[2098] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 446);

[2099] Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 433);

[2100] Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 434);

[2101] Ac-Nle-c[Asp-dPhe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 488);

[2102] Ac-Nle-c[Asp-dBip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 490);

[2103] Ac-Nle-c[Asp-dTrp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 494);

[2104] Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 443);

[2105] Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 268);

[2106] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 363);

[2107] Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 365);

[2108] Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 370);

[2109] Ac-Nle-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 378);

[2110] Ac-dArg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 379);

[2111] Ac-Nle-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 380);

[2112] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 418);

[2113] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 621);

[2114] Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 666);

[2115] Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 297);

[2116] Ac-Nle-c[Asp-His-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 228);

[2117] Ac-Nle-c[Asp-His-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 229);

[2118] Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 281);

[2119] Ac-Nle-c[Asp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 355);

[2120] Ac-Nle-c[Asp-Tic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 362);

[2121] Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 424);

[2122] Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 366);

[2123] Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 368);

[2124] Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dLeu-dPro-NH_2 (SEQ ID NO: 422);

[2125] Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 372);

[2126] Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 374);

[2127] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 639);

[2128] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 352);

[2129] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 351);

[2130] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Trp-NH_2 (SEQ ID NO: 600);

[2131] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 322);

[2132] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dAsn-NH_2 (SEQ ID NO: 605);

[2133] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Gly-Gly-NH_2 (SEQ ID NO: 610);

[2134] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-NH_2 (SEQ ID NO: 581);

[2135] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 353);

[2136] Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 319);

[2137] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-dPro-NH_2 (SEQ ID NO: 607);

[2138] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 638);

[2139] Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 295);

[2140] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 575);

[2141] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 587);

[2142] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-NH_2 (SEQ ID NO: 582);

[2143] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Pro-Val-NH_2 (SEQ ID NO: 588);

[2144] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-dPro-NH_2 (SEQ ID NO: 612);

[2145] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Pro-Val-NH_2 (SEQ ID NO: 583);

[2146] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Ala-Ala-NH_2 (SEQ ID NO: 609);

[2147] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dTle-NH_2 (SEQ ID NO: 594);

[2148] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 631);

[2149] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Val-Pro-NH_2 (SEQ ID NO: 589);

[2150] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 597);

[2151] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 628);

[2152] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 591);

[2153] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 590);

[2154] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 311);

[2155] Ac-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 629);

[2156] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Hyp-NH_2 (SEQ ID NO: 574);

[2157] Ac-dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 303);

[2158] Ac-Nle-c[Asp-Oic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 360);

[2159] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 313);

[2160] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291);

[2161] Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 299);

[2162] Phe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 305);

[2163] His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 306);

[2164] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 312);

[2165] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 314);

[2166] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 315);

[2167] Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 321);

[2168] Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 423);

[2169] Ac-Nle-Phe-Phe-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 421);

[2170] Ac-Nle-c[Cys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 383);

[2171] Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 384);

[2172] Ac-Lys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 387);

[2173] Ac-Arg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 389);

[2174] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 403);

[2175] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 407);

[2176] Ac-Nle-c[Asp-Trp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 395);

[2177] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 633);

[2178] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-Pro-NH_2 (SEQ ID NO: 573);

[2179] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 643);

[2180] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-NH_2 (SEQ ID NO: 576);

[2181] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Pro-NH_2 (SEQ ID NO: 577);

[2182] dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 309);

[2183] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 593);

[2184] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 632);

[2185] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-NH_2 (SEQ ID NO: 603);

[2186] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617);

[2187] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 620);

[2188] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 634);

[2189] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 635);

[2190] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 644);

[2191] Ac-dTyr-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 304);

[2192] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 642);

[2193] dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 308);

[2194] Ac-Nle-c[Asp-Atc-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 212);

[2195] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 226);

[2196] Ac-Nle-c[dPen-Pro-dPhe-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 320);

[2197] Ac-Nle-c[Cys-dPhe-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 324);

[2198] Ac-Nle-c[Asp-Cpe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 358);

[2199] Ac-Nle-c[Asp-Che-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 359);

[2200] Ac-Nle-c[Asp-dPhe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 367);

[2201] Ac-Nle-c[Asp-dGln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 371);

[2202] Ac-Nle-c[Asp-dTrp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 373);

[2203] Ac-Nle-c[Asp-dTyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 375);

[2204] Ac-Arg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 381);

[2205] Ac-dArg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 382);

[2206] Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 385);

[2207] Ac-Ala-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 386);

[2208] Ac-dLys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 388);

[2209] Ac-dArg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 390);

[2210] Ac-dHis-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 391);

[2211] Ac-His-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 392);

[2212] Ac-Nle-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 393);

[2213] Ac-Nle-c[Asp-Trp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 394);

[2214] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 405);

[2215] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 406);

[2216] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 408);

[2217] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 409);

[2218] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 410);

[2219] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 411);

[2220] Ac-Nle-c[Asp-Phe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 412);

[2221] Ac-Nle-c[Asp-His-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 413);

[2222] Ac-Nle-c[Asp-Tyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 414);

[2223] Ac-Nle-c[Asp-dPhe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 415);

[2224] Ac-Nle-c[Asp-dHis-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 416);

[2225] Ac-Nle-c[Asp-dTyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 417);

[2226] Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 419);

[2227] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 596);

[2228] Ac-Nle-c[dAsp-Pro-dPhe-Arg-Trp-dLys]-dPro-dVal-NH_2 (SEQ ID NO: 622);

[2229] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 645);

[2230] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 646);

[2231] Ac-dLeu-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 298);

[2232] Ac-Nle-c[Asp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 354);

[2233] Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 364);

[2234] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Arg-NH_2 (SEQ ID NO: 578);

[2235] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 300);

[2236] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dArg-NH_2 (SEQ ID NO: 579);

[2237] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 580);

[2238] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 640);

[2239] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 641);

[2240] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 584);

[2241] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Val-Pro-NH_2 (SEQ ID NO: 585);

[2242] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2 (SEQ ID NO: 586);

[2243] Ac-dNle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 301);

[2244] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 595);

[2245] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 598);

[2246] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 302);

[2247] Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 630);

[2248] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2 (SEQ ID NO: 601);

[2249] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAla-dAla-NH_2 (SEQ ID NO: 602);

[2250] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dHyp-NH_2 (SEQ ID NO: 604);

[2251] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Asp-NH_2 (SEQ ID NO: 606);

[2252] Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 318);

[2253] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Hyp-NH_2 (SEQ ID NO: 608);

[2254] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-dPro-NH_2 (SEQ ID NO: 611);

[2255] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-NH_2 (SEQ ID NO: 613);

[2256] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsp-NH_2 (SEQ ID NO: 614);

[2257] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-NH_2 (SEQ ID NO: 615);

[2258] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-NH_2 (SEQ ID NO: 616);

[2259] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 599);

[2260] Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 296);

[2261] Ac-Nle-c[Asp-Aba-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 198);

[2262] Ac-Nle-c[Asp-Aia-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 207);

[2263] Ac-Nle-c[Asp-Ata-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 208);

[2264] Ac-Nle-c[Asp-Pro-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 225);

[2265] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2 (SEQ ID NO: 592);

[2266] Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 425);

[2267] Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 427);

[2268] Ac-Nle-c[Asp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 429);

[2269] Ac-Nle-c[Pen-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 325);

[2270] Ac-Nle-c[dPen-dPhe-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 326);

[2271] Ac-Nle-c[Asp-dIle-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 356);

[2272] Ac-Nle-c[Asp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 357);

[2273] Ac-Arg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 376);

[2274] Ac-dArg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 377);

[2275] Ac-Nle-c[Asp-Trp-dLeu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 396);

[2276] Ac-Nle-c[Asp-Trp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 397);

[2277] Ac-Nle-c[Asp-Trp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 398);

[2278] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 400);

[2279] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 401);

[2280] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dPhe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 402);

[2281] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 399);

[2282] Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 404);

[2283] Ac-Nle-c[Asp-Pro-dPhe-Arg-dTrp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 187);

[2284] Ac-Nle-c[Asp-Pro-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 231);

[2285] Ac-Nle-c[Asp-Pro-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 232);

[2286] Ac-Nle-c[Asp-Pro-dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 233);

[2287] Ac-Nle-c[Asp-Pro-dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 234);

[2288] Ac-Nle-c[Asp-Pro-dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 235);

[2289] Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 428);

[2290] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[2291] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[2292] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[2293] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[2294] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[2295] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[2296] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[2297] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[2298] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[2299] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[2300] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[2301] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[2302] Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

[2303] Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

[2304] Ac-Nle-c[Asp-dTrp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 532);

[2305] Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 209);

[2306] Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 210);

[2307] Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 211);

[2308] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[2309] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[2310] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

[2311] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

[2312] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[2313] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[2314] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[2315] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[2316] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[2317] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

[2318] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

[2319] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

[2320] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

[2321] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[2322] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[2323] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[2324] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[2325] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[2326] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[2327] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[2328] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[2329] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[2330] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

[2331] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

[2332] Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

[2333] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

[2334] 32. The method or the use of any one of embodiments 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA):

[2335] X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (IA),

[2336] wherein:

[2337] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2338] X^2 is absent, phenylalanine (Phe), or Nle;

[2339] X^3 is absent, Phe, or Nle;

[2340] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2341] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[2342] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic),

2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[2343] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[2344] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[2345] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2346] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2347] R^8 is Lys or dPen;

[2348] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2349] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2350] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2351] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2352] Y^5 is absent or dVal;

[2353] Y^6 is absent or dVal;

[2354] Y^7 is absent or dPro; and

[2355] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2356] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2357] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[2358] a lactam bridge between R^1 and R^7 or R^8 when R^1 is Asp and R^7 or R^8 is Lys;

[2359] provided that:

[2360] when R^4 is p(Br)dPhe, then R^1 is Nle or Ala, Y^4-Y^7 are absent, and at least one of X^1 and Y^3 is absent;

[2361] when R^4 is p(Cl)dPhe, then (i) R^3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro or (ii) R^3 is His and R^6 is not Trp;

[2362] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

[2363] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^2 is not Pro.

[2364] 33. The method or the use of any one of embodiments 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA), wherein:

[2365] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2366] X^2 is absent, phenylalanine (Phe), or Nle;

[2367] X^3 is absent, Phe, or Nle;

[2368] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine

(dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2369] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[2370] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

[2371] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[2372] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[2373] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2374] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2375] R^8 is Lys or dPen;

[2376] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2377] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2378] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2379] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2380] Y^5 is absent or dVal;

[2381] Y^6 is absent or dVal;

[2382] Y^7 is absent or dPro; and

[2383] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2384] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2385] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[2386] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2387] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[2388] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[2389] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[2390] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);

[2391] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);

[2392] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);

[2393] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);

[2394] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

[2395] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

[2396] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);

[2397] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

[2398] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);

[2399] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561);

[2400] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[2401] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[2402] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[2403] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[2404] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[2405] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[2406] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[2407] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[2408] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[2409] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[2410] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[2411] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[2412] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[2413] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[2414] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[2415] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[2416] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[2417] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[2418] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[2419] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[2420] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[2421] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[2422] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[2423] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[2424] Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

[2425] Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

[2426] Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 209);

[2427] Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 210);

[2428] Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 211);

[2429] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[2430] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[2431] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

[2432] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

[2433] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[2434] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[2435] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[2436] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[2437] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[2438] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

[2439] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

[2440] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

[2441] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

[2442] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[2443] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[2444] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[2445] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[2446] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[2447] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[2448] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[2449] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[2450] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[2451] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

[2452] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

[2453] Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

[2454] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

[2455] 34. The method or the use of any one of embodiments 1-30 and 32, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA), wherein:

[2456] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2457] X^2 is absent or Nle;

[2458] X^3 is absent or Nle;

[2459] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu);

[2460] R^2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, and tryptophan (Trp);

[2461] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip);

[2462] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[2463] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn);

[2464] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2465] R^7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2466] R^8 is Lys or dPen;

[2467] Y^1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2468] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2469] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2470] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2471] Y^5 is absent or dVal;

[2472] Y^6 is absent or dVal;

[2473] Y^7 is absent or dPro; and

[2474] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2475] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2476] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[2477] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2478] provided that:

[2479] when R^4 is p(Br)dPhe, then R^1 is Nle or Ala, R^5 is Arg, Y^4-Y^7 are absent, and at least one of X^1 and Y^3 is absent;

[2480] when R^4 is p(Cl)dPhe, then R^3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro; and

[2481] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro and R^1 is not dArg, Arg, dTyr, or Ala, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys.

[2482] 35. The method or the use of any one of embodiments 1-29 and 33, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA), wherein:

[2483] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2484] X^2 is absent or Nle;

[2485] X^3 is absent or Nle;

[2486] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys),

D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu);

[2487] R^2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, and tryptophan (Trp);

[2488] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip);

[2489] R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine ($p(CF_3)$dPhe);

[2490] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn);

[2491] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2492] R^7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2493] R^8 is Lys or dPen;

[2494] Y^1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2495] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTIe, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2496] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2497] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2498] Y^5 is absent or dVal;

[2499] Y^6 is absent or dVal;

[2500] Y^7 is absent or dPro; and

[2501] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2502] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2503] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[2504] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2505] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[2506] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[2507] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[2508] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[2509] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTIe-dPro-NH_2 (SEQ ID NO: 556);

[2510] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTIe-dPro-NH_2 (SEQ ID NO: 557);

[2511] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[2512] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[2513] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[2514] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[2515] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[2516] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[2517] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[2518] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[2519] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[2520] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[2521] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[2522] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[2523] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[2524] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[2525] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[2526] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[2527] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[2528] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[2529] Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

[2530] Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

[2531] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[2532] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[2533] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

[2534] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

[2535] Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 329);

[2536] Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 330);

[2537] Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 332);

[2538] Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 333);

[2539] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[2540] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[2541] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[2542] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[2543] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[2544] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

[2545] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

[2546] Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

[2547] Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

[2548] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[2549] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[2550] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[2551] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[2552] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[2553] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[2554] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[2555] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[2556] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[2557] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62); and

[2558] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63).

[2559] 36. The method or the use of any one of embodiments 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IB):

[2560] X^1-X^2-X^3-R^1-R^2-R^3-dNal(2')-R^5-R^6-R^7-R^8-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (IB),

[2561] wherein:

[2562] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2563] X^2 is absent, phenylalanine (Phe), or Nle;

[2564] X^3 is absent, Phe, or Nle;

[2565] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt),

D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2566] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[2567] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe);

[2568] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[2569] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2570] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2571] R^8 is absent or is Lys or dPen;

[2572] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2573] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2574] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2575] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2576] Y^5 is absent or dVal;

[2577] Y^6 is absent or dVal;

[2578] Y^7 is absent or dPro; and

[2579] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2580] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2581] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

[2582] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2583] provided that:

[2584] when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is not Ala, Leu, dLeu, dVal, or Gly, and if R^3 is absent, then R^2 is Pen and R^7 is dCys; and

[2585] when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

[2586] 37. The method or the use of any one of embodiments 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IB), wherein:

[2587] X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

[2588] X^2 is absent, phenylalanine (Phe), or Nle;

[2589] X^3 is absent, Phe, or Nle;

[2590] R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2591] R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

[2592] R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe);

[2593] R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

[2594] R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

[2595] R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

[2596] R^8 is absent or is Lys or dPen;

[2597] Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

[2598] Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

[2599] Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

[2600] Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

[2601] Y^5 is absent or dVal;

[2602] Y^6 is absent or dVal;

[2603] Y^7 is absent or dPro; and

[2604] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2605] a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

[2606] a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

[2607] a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

[2608] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[2609] Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

[2610] Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

[2611] Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

[2612] Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

[2613] Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

[2614] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

[2615] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

[2616] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

[2617] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

[2618] Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

[2619] Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

[2620] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

[2621] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

[2622] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

[2623] Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

[2624] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

[2625] Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

[2626] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

[2627] 38. The method or the use of any one of embodiments 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IC):

[2628] X^1-R^1-R^2-R^3-R^4-R^5-R^6-R^7-Y^1-Y^2-Y^3-Y^4 (IC),

[2629] wherein:

[2630] X^1 is absent or norleucine (Nle)

[2631] R^1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys);

[2632] R^2 is aspartic acid (Asp) or cysteine (Cys);

[2633] R^3 is His or proline (Pro);

[2634] R^4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[2635] R^5 is Arg or His;

[2636] R^6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2'));

[2637] R^7 is Lys or Cys;

[2638] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[2639] Y^2 is selected from the group consisting of dVal, dPro, and dTle;

[2640] Y^3 is absent or is dVal or dPro;

[2641] Y^4 is absent or dPro; and

[2642] the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of:

[2643] a disulfide bond between Cys at R^2 and Cys R^7; and

[2644] a lactam bridge between Asp at R^2 and Lys at R^7;

[2645] provided that:

[2646] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent.

[2647] 39. The method or the use of any one of embodiments 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IC), wherein:

[2648] X^1-R^1-R^2-R^3-R^4-R^5-R^6-R^7-Y^1-Y^2-Y^3-Y^4 (IC),

[2649] wherein:

[2650] X^1 is absent or norleucine (Nle)

[2651] R^1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys);

[2652] R^2 is aspartic acid (Asp) or cysteine (Cys);

[2653] R^3 is His or proline (Pro);

[2654] R^4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

[2655] R^5 is Arg or His;

[2656] R^6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2'));

[2657] R^7 is Lys or Cys;

[2658] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[2659] Y^2 is selected from the group consisting of dVal, dPro, and dTle;

[2660] Y^3 is absent or is dVal or dPro;

[2661] Y^4 is absent or dPro; and

[2662] the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of:

[2663] a disulfide bond between Cys at R^2 and Cys R^7; and

[2664] a lactam bridge between Asp at R^2 and Lys at R^7;

[2665] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[2666] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[2667] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[2668] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[2669] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[2670] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[2671] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[2672] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[2673] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[2674] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[2675] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[2676] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[2677] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[2678] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[2679] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

[2680] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511); and

[2681] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515).

[2682] 40. The method or the use of any one of embodiments 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (ID):

[2683] X^1-R^1-R^2-R^3-R^4-R^5-R^6-R^7-Y^1-Y^2-Y^3-Y^4 (ID),

[2684] wherein:

[2685] X^1 is absent or norleucine (Nle);

[2686] R^1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2687] R^2 is aspartic acid (Asp) or cysteine (Cys);

[2688] R^3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip);

[2689] R^4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[2690] R^5 is selected from the group consisting of Arg, Lys, and His;

[2691] R^6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2'));

[2692] R^7 is Lys or Cys;

[2693] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[2694] Y^2 is dVal or dPro;

[2695] Y^3 is absent, dVal, or dPro;

[2696] Y^4 is absent or dPro; and

[2697] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2698] a disulfide bond between Cys at R^2 and Cys at R^7; and

[2699] a lactam bridge between Asp at R^2 and Lys at R^7;

[2700] provided that:

[2701] when R^4 is p(Br)dPhe and R^1 is Nle or Ala, then the C-terminus is not dVal-dPro or dTle-dPro and if the C-terminus is dPro-dVal-dPro, then X^1 is present.

[2702] when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

[2703] when R^4 is dPhe, then R^3 is Pro and either R^5 is Lys or R^6 is dNal(2') or Nal(2'); and

[2704] when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, and Gln, R^6 is Trp, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent.

[2705] 41. The method or the use of any one of embodiments 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (ID), wherein:

[2706] R^1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

[2707] R^2 is aspartic acid (Asp) or cysteine (Cys);

[2708] R^3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip);

[2709] R^4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

[2710] R^5 is selected from the group consisting of Arg, Lys, and His;

[2711] R^6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2'));

[2712] R^7 is Lys or Cys;

[2713] Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

[2714] Y^2 is dVal or dPro;

[2715] Y^3 is absent, dVal, or dPro;

[2716] Y^4 is absent or dPro; and

[2717] the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

[2718] a disulfide bond between Cys at R^2 and Cys at R^7; and

[2719] a lactam bridge between Asp at R^2 and Lys at R^7;

[2720] provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

[2721] Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);

[2722] Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);

[2723] Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);

[2724] Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);

[2725] Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);

[2726] Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);

[2727] Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571);

[2728] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);

[2729] Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);

[2730] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);

[2731] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);

[2732] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[2733] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);

[2734] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);

[2735] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);

[2736] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);

[2737] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);

[2738] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);

[2739] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 223);

[2740] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 464);

[2741] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 465);

[2742] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 466);

[2743] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 467);

[2744] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 468);

[2745] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 469);

[2746] Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 470);

[2747] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 474);

[2748] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 475);

[2749] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 476);

[2750] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 477);

[2751] Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 478);

[2752] Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 481);

[2753] Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 482);

[2754] Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 483);

[2755] Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 484);

[2756] Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 485);

[2757] Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 459);

[2758] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 472);

[2759] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 471);

[2760] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 463);

[2761] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 462);

[2762] Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 479);

[2763] Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 473);

[2764] Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 480);

[2765] Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 486);

[2766] Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 491);

[2767] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 218);

[2768] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 442);

[2769] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 449);

[2770] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 455);

[2771] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 447);

[2772] Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 438);

[2773] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 450);

[2774] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 435);

[2775] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 439);

[2776] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 441);

[2777] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 436);

[2778] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 454);

[2779] Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 452);

[2780] Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 451);

[2781] Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 456);

[2782] Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 437);

[2783] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 440);

[2784] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 448);

[2785] Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 457);

[2786] Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 453);

[2787] Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 458);

[2788] Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 443);

[2789] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 363);

[2790] Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 365);

[2791] Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 370);

[2792] Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 621);

[2793] Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 297);

[2794] Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 366);

[2795] Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 368);

[2796] Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 372);

[2797] Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 374);

[2798] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 639);

[2799] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 638);

[2800] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 295);

[2801] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 597);

[2802] Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 628);

[2803] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 591);

[2804] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 311);

[2805] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 313);

[2806] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291);

[2807] Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 299);

[2808] His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 306);

[2809] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 312);

[2810] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 314);

[2811] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 315);

[2812] Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 643);

[2813] dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 309);

[2814] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617);

[2815] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 620);

[2816] Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 644);

[2817] Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 642);

[2818] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 596);

[2819] Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 645);

[2820] Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 646);

[2821] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 300);

[2822] Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 640);

[2823] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 641);

[2824] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 595);

[2825] Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 598);

[2826] Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 302);

[2827] Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 425);

[2828] Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 318);

[2829] Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);

[2830] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[2831] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[2832] Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);

[2833] Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);

[2834] Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);

[2835] Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);

[2836] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

[2837] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

[2838] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

[2839] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

[2840] Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

[2841] Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

[2842] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

[2843] Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

[2844] Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

[2845] Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

[2846] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

[2847] Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

[2848] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

[2849] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513); and

[2850] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515).

[2851] 42. The method or the use of any one of embodiments 1-41, wherein an N-terminus of the non-naturally occurring melanocortin analog, if present, is modified by an acyl group.

[2852] 43. The method or the use of embodiment 42, wherein the acyl group is an acetyl group.

[2853] 44. The method or the use of any one of embodiments 1-41, wherein an N-terminus of the non-naturally occurring melanocortin analog, if present, is not modified.

[2854] 45. The method or the use of any one of embodiments 1-44, wherein a C-terminus of the non-naturally occurring melanocortin analog is modified by an amide group.

[2855] 46. The method or the use of any one of embodiments 1-44, wherein a C-terminus of the non-naturally occurring melanocortin analog is not modified.

[2856] 47. The method or the use of any one of embodiments 1-46, wherein R^4 is dNal(2').

[2857] 48. The method or the use of any one of embodiments 1-47, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized.

[2858] 49. The method or the use of any one of embodiments 1-48, wherein R^3 is Pro, Hyp, or His.

[2859] 50. The method or the use of any one of embodiments 1-49, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2860] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro (SEQ ID NO: 2);

[2861] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 3);

[2862] Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 4);

[2863] Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 5);

[2864] Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dLeu-dPro-NH_2 (SEQ ID NO: 6);

[2865] Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 7);

[2866] Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 9); and

[2867] Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 10),

[2868] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond.

[2869] 51. The method or the use of any one of embodiments 1-48, wherein R^9 is present.

[2870] 52. The method or the use of any one of embodiments 1-48 and 51, wherein the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-c[Asp-Phe-Phe-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 11), wherein c represents cyclization through R^1 and R^9 via a lactam bond.

[2871] 53. The method or the use of any one of embodiments 1-48, wherein R^9 is absent and X^1-X^3 are present.

[2872] 54. The method or the use of any one of embodiments 1-48 and 53, wherein the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-Phe-Phe-$_c$[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 12), wherein c represents cyclization through R^1 and R^8 via a lactam bond.

[2873] 55. The method or the use of any one of embodiments 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized between R^2 and R^7 via a lactam bond or a disulfide bond.

[2874] 56. The method or the use of any one of embodiments 1-48 and 55, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2875] Ac-Nle-c[dAsp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 38);

[2876] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dLys]-dVal-dPro-NH_2 (SEQ ID NO: 39);

[2877] Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 40);

[2878] Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 41);

[2879] Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 42);

[2880] Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 43);

[2881] Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 48);

[2882] Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 49);

[2883] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 50);

[2884] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 51);

[2885] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 52);

[2886] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 53);

[2887] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 54);

[2888] Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 55);

[2889] Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 59);

[2890] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 64);

[2891] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2 (SEQ ID NO: 65);

[2892] Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 66);

[2893] Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2 (SEQ ID NO: 67); and

[2894] c[CO-cis-CH = CH-CO-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 197),

[2895] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond or a disulfide bond.

[2896] 57. The method or the use of any one of embodiments 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized through a lactam bond between Asp at R^1 or R^2 and Lys at R^7.

[2897] 58. The method or the use of any one of embodiments 1-48 and 57, wherein R^1 is selected from the group consisting of dArg, dMet, dIle, dLeu, dVal, dAla, Ala, Tle, dTle, dNle, Nva, Gly, dPro, dCys, dPhe, dGln, dAsn, *trans*Pro(guan), *cis*Pro(guan), dTyr, Tyr, and Dmt.

[2898] 59. The method or the use of any one of embodiments 1-48, 57, and 58, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2899] Ac-dArg-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 15);

[2900] Ac-dMet-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 16);

[2901] Ac-dIle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 17);

[2902] Ac-dLeu-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 18);

[2903] Ac-dVal-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 19);

[2904] Ac-dAla-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 20);

[2905] Ac-Ala-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 21);

[2906] Ac-Tle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 22);

[2907] Ac-dTle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 23);

[2908] Ac-dNle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 24);

[2909] Ac-Nva-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 25);

[2910] Ac-Gly-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 26);

[2911] Ac-dPro-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 27);

[2912] Ac-dCys-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 28);

[2913] Ac-dPhe-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 29);

[2914] Ac-dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 30);

[2915] Ac-dGln-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 31);

[2916] Ac-dAsn-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 32);

[2917] Ac-*trans*Pro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 33);

[2918] Ac-*cis*Pro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 34);

[2919] dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 35);

[2920] Tyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 36); and

[2921] Dmt-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 37),

[2922] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[2923] 60. The method or the use of any one of embodiments 1-48 and 57, wherein R^3 is absent or selected from the group consisting of Ala, dAla, dMet, Gly, Leu, Ile, Val, dLeu, dIle, dVal, Trp, *trans*Pro(guan), *cis*Pro(guan), b-Ala, Mamb, Acpc, Aba, Aia, Aic, Cpe, Che, Oic, Tic, and Glu.

[2924] 61. The method or the use of any one of embodiments 1-48, 57, and 60, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2925] Ac-Nle-c[Asp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 68);

[2926] Ac-Nle-c[Asp-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 69);

[2927] Ac-Nle-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 71);

[2928] Ac-Nle-c[Asp-dMet-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 72);

[2929] Ac-Nle-c[Asp-Pro-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 73);

[2930] Ac-Nle-c[Asp-Gly-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 74);

[2931] Ac-Nle-c[Asp-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 75);

[2932] Ac-Nle-c[Asp-Leu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 76);

[2933] Ac-Nle-c[Asp-Ile-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 77);

[2934] Ac-Nle-c[Asp-Val-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 78);

[2935] Ac-Nle-c[Asp-dLeu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 79);

[2936] Ac-Nle-c[Asp-dIle-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 80);

[2937] Ac-Nle-c[Asp-dVal-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 81);

[2938] Ac-Nle-c[Asp-Trp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 82);

[2939] Ac-Nle-c[Asp-*trans*Pro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 84);

[2940] Ac-Nle-c[Asp-*cis*Pro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 85),

[2941] Ac-Nle-c[Asp-β-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 199);

[2942] Ac-Nle-c[Asp-Mamb-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 200);

[2943] Ac-Nle-c[Asp-Acpc-dNal(2') Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 201);

[2944] Ac-Nle-c[Asp-Aba-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 204);

[2945] Ac-Nle-c[Asp-Aia-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 205);

[2946] Ac-Nle-c[Asp-Aic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 239);

[2947] Ac-Nle-c[Asp-Cpe-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 240);

[2948] Ac-Nle-c[Asp-Che-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 241);

[2949] Ac-Nle-c[Asp-Oic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 242);

[2950] Ac-Nle-c[Asp-Tic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 244); and

[2951] Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 255),

[2952] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond.

[2953] 62. The method or the use of any one of embodiments 1-48 and 57, wherein R^5 is absent or selected from the group consisting of Lys, Orn, His, Ala, *trans*Pro(guan), *cis*Pro(guan), and Glu.

[2954]

[2955] 63. The method or the use of any one of embodiments 1-48, 57, and 62, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2956] Ac-Nle-c[Asp-Pro-dNal(2')-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 86);

[2957] Ac-Nle-c[Asp-Pro-dNal(2')-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 87);

[2958] Ac-Nle-c[Asp-Pro-dNal(2')-Orn-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 90);

[2959] Ac-Nle-c[Asp-Pro-dNal(2')-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 92);

[2960] Ac-Nle-c[Asp-Pro-dNal(2')-Ala-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 93);

[2961] Ac-Nle-c[Asp-Pro-dNal(2')-Glu-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 96);

[2962] Ac-Nle-c[Asp-His-dNal(2')-*trans*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 247);

[2963] Ac-Nle-c[Asp-His-dNal(2')-*cis*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 248);

[2964] Ac-Nle-c[Asp-Pro-dNal(2')-*trans*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 250); and

[2965] Ac-Nle-c[Asp-Pro-dNal(2')-*cis*Pro(guan)Pro-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 251),

[2966] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[2967] 64. The method or the use of any one of embodiments 1-48 and 57, wherein R^6 is selected from the group consisting of Nal(1'), dNal(1'), Aia, Phe, dPhe, Tyr, dTyr, dNal(2'), dTrp, Aba, and Ata.

[2968] 65. The method or the use of any one of embodiments 1-48, 57, and 64, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2969] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Nal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 102);

[2970] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aia-Lys]-dVal-dPro-NH2 (SEQ ID NO: 103);

[2971] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Phe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 104);

[2972] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Tyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 105);

[2973] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 108);

[2974] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dPhe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 109);

[2975] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(2']-Lys]-dVal-dPro-NH2 (SEQ ID NO: 110);

[2976] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 111);

[2977] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTrp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 196);

[2978] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 253); and

[2979] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 254),

[2980] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[2981] 66. The method or the use of any one of embodiments 1-48 and 57, wherein:

[2982] (i) Y^1 is selected from dPro, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, Lys, dLys, Trp, and dTle and Y^2 is absent or selected from dVal, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, and dTle; or

[2983] (ii) Y^1 is dVal, Y^2 is dPro, and the C-terminus of the non-naturally occurring melanocortin analog is not modified.

[2984] 67. The method or the use of any one of embodiments 1-48, 57, and 66, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[2985] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Pro-NH_2 (SEQ ID NO: 115);

[2986] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 116);

[2987] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 117);

[2988] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Hyp-NH_2 (SEQ ID NO: 118);

[2989] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 119);

[2990] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Hyp-NH_2 (SEQ ID NO: 120);

[2991] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-dHyp-NH_2 (SEQ ID NO: 121);

[2992] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-dVal-NH_2 (SEQ ID NO: 122);

[2993] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-dVal-NH_2 (SEQ ID NO: 123);

[2994] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-Val-NH_2 (SEQ ID NO: 124);

[2995] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-Val-NH_2 (SEQ ID NO: 125);

[2996] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-NH_2 (SEQ ID NO: 126);

[2997] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-NH_2 (SEQ ID NO: 127);

[2998] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-NH_2 (SEQ ID NO: 128);

[2999] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-NH_2 (SEQ ID NO: 129);

[3000] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-NH_2 (SEQ ID NO: 130);

[3001] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Pro-NH_2 (SEQ ID NO: 131);

[3002] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-NH_2 (SEQ ID NO: 132);

[3003] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-NH_2 (SEQ ID NO: 133);

[3004] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-NH_2 (SEQ ID NO: 134);

[3005] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-NH_2 (SEQ ID NO: 135);

[3006] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-dAla-NH_2 (SEQ ID NO: 136);

[3007] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-Ala-NH_2 (SEQ ID NO: 137);

[3008] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Gly-Gly-NH_2 (SEQ ID NO: 138);

[3009] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asp-NH_2 (SEQ ID NO: 139);

[3010] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Arg-NH_2 (SEQ ID NO: 140);

[3011] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asn-NH_2 (SEQ ID NO: 141);

[3012] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsp-NH_2 (SEQ ID NO: 142);

[3013] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dArg-NH_2 (SEQ ID NO: 143);

[3014] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsn-NH_2 (SEQ ID NO: 144);

[3015] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-dPro-NH_2 (SEQ ID NO: 145);

[3016] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-NH_2 (SEQ ID NO: 146);

[3017] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-dPro-NH_2 (SEQ ID NO: 147);

[3018] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-dPro-NH_2 (SEQ ID NO: 148);

[3019] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 149);

[3020] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-dPro-NH_2 (SEQ ID NO: 150);

[3021] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-NH_2 (SEQ ID NO: 151);

[3022] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-NH_2 (SEQ ID NO: 152);

[3023] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-NH_2 (SEQ ID NO: 153);

[3024] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-NH_2 (SEQ ID NO: 154);

[3025] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-NH_2 (SEQ ID NO: 155);

[3026] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-NH_2 (SEQ ID NO: 156);

[3027] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Pro-Val-NH_2 (SEQ ID NO: 157);

[3028] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2 (SEQ ID NO: 158);

[3029] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-dVal-NH_2 (SEQ ID NO: 159);

[3030] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-NH_2 (SEQ ID NO: 160);

[3031] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 161);

[3032] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Val-Pro-NH_2 (SEQ ID NO: 162);

[3033] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2 (SEQ ID NO: 163);

[3034] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 164);

[3035] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Pro-Val-NH_2 (SEQ ID NO: 165);

[3036] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-dVal-NH_2 (SEQ ID NO: 166);

[3037] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-dVal-NH_2 (SEQ ID NO: 167);

[3038] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Val-Pro-NH_2 (SEQ ID NO: 168);

[3039] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dVal-dPro-NH_2 (SEQ ID NO: 169);

[3040] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 170);

[3041] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-dPro-NH_2 (SEQ ID NO: 171);

[3042] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 172);

[3043] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-NH_2 (SEQ ID NO: 173);

[3044] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-NH_2 (SEQ ID NO: 174);

[3045] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2 (SEQ ID NO: 175);

[3046] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 176);

[3047] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dTle-NH_2 (SEQ ID NO: 177);

[3048] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dTle-NH_2 (SEQ ID NO: 178);

[3049] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Trp-NH_2 (SEQ ID NO: 203); and

[3050] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 263),

[3051] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[3052] 68. The method or the use of any one of embodiments 1-48 and 57, wherein one or more of Y^3-Y^7 are present and are each independently dVal or dPro.

[3053] 69. The method or the use of any one of embodiments 1-48, 57, and 68, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[3054] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 179);

[3055] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 180);

[3056] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 181);

[3057] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 182); and

[3058] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 183),

[3059] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[3060] 70. The method or the use of any one of embodiments 1-48 and 57, wherein one or more of X^1-X^3 are present and are Nle.

[3061] 71. The method or the use of any one of embodiments 1-48, 57, and 70, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[3062] Ac-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 184);

[3063] Ac-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 185); and

[3064] Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 186),

[3065] wherein c represents cyclization through R^2 and R^7 via a lactam bond.

[3066] 72. The method or the use of any one of embodiments 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized through a lactam bond between (i) Asp at R^1 and Lys at R^7, (ii) Asp at R^2 and Lys at R^8, or (ii) Asp at R^1 and Lys at R^8.

[3067] 73. The method or the use of any one of embodiments 1-48 and 72, wherein R^2 is selected from Asp, Trp, Pro, and Glu, R^3 is selected from Pro, Glu, and His, and R^7 is selected from Lys, Pro, and Gly.

[3068] 74. The method or the use of any one of embodiments 1-48, 72, and 73, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[3069] Ac-Nle-c[Asp-Pro-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 194);

[3070] Ac-Nle-c[Asp-Trp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 195);

[3071] Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 257);

[3072] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 245);

[3073] Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 256);

[3074] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 259);

[3075] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 260);

[3076] Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 261);

[3077] Ac-Glu-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 262);

[3078] Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 264); and

[3079] Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 265),

[3080] wherein c represents cyclization through R^1 or R^2 and R^7 or R^8 via a lactam bond.

[3081] 75. The method or the use of any one of embodiments 1-48, wherein one of R^2 and R^3 is Ala or dAla.

[3082] 76. The method or the use of any one of embodiments 1-48, 72, and 75, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[3083] Ac-Nle-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 266);

[3084] Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 267);

[3085] Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 269);

[3086] Ac-dArg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 270);

[3087] Ac-Arg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 271);

[3088] Ac-dArg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 272);

[3089] Ac-Nle-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 273);

[3090] Ac-Arg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 274);

[3091] Ac-dArg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 275);

[3092] Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-NH_2 (SEQ ID NO: 282); and

[3093] Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 283),

[3094] wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond or a disulfide bond.

[3095] 77. The method or the use of any one of embodiments 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized through a disulfide bond between dPen at R^2 and dPen at R^7 or R^8.

[3096] 78. The method or the use of any one of embodiments 1-48 and 77, wherein R^1 is selected from the group consisting of Nle, dLeu, dNle, dArg, Arg, dPhe, dTyr, Ala, dHis, His, dLys, and Lys.

[3097] 79. The method or the use of any one of embodiments 1-48, 77, and 78, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[3098] Ac-dLeu-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 327);

[3099] Ac-dNle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 328);

[3100] Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 329);

[3101] Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 330);

[3102] Ac-dPhe-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 331);

[3103] Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 332);

[3104] Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 333);

[3105] Ac-dHis-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 334);

[3106] Ac-His-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 335);

[3107] Ac-dLys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 336);

[3108] Ac-Lys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 337);

[3109] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 344);

[3110] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 345);

[3111] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dPro-NH_2 (SEQ ID NO: 346);

[3112] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dPro-NH_2 (SEQ ID NO: 347);

[3113] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dHyp-NH_2 (SEQ ID NO: 348);

[3114] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dTle-dPro-NH_2 (SEQ ID NO: 349); and

[3115] Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Gly-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 350),

[3116] wherein c represents cyclization through R^1 or R^2 and R^7 or R^8 via a disulfide bond.

[3117] 80. The method or the use of any one of embodiments 1-47, wherein the non-naturally occurring melanocortin analog is linear.

[3118] 81. The method or the use of any one of embodiments 1-47 and 80, wherein the sequence of any one of Formulae (I)-(ID) is:

[3119] Ac-Nle-Asp-Pro-dNal(2')-Arg-Trp-Lys-dVal-dPro-NH_2 (SEQ ID NO: 13); or

[3120] Ac-Nle-Pro-dNal(2')-Arg-Trp-dVal-dPro-NH_2 (SEQ ID NO: 14).

[3121] 82. The method or the use of any one of embodiments 1-46, wherein R^4 is selected from the group consisting of dPhe, p(Cl)dPhe p(I)dPhe, p(Br)dPhe, p(F)dPhe, or p(CF_3)dPhe.

[3122] 83. The method or the use of any one of embodiments 1-46 and 82, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

[3123] Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);

[3124] Ac-Nle-c[Asp-Pro-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 216);

[3125] Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);

[3126] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 219);

[3127] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

[3128] Ac-Nle-c[Asp-His-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 221);

[3129] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);

[3130] Ac-Nle-c[Asp-His-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 224);

[3131] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 236);

[3132] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 237);

[3133] Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 238);

[3134] Ac-Nle-c[Asp-dBip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 369);

[3135] Ac-Nle-c[Asp-Pro-dPhe-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 426);

[3136] Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 430);

[3137] Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 431);

[3138] Ac-Nle-c[Cys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 432);

[3139] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 444);

[3140] Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 445);

[3141] Ac-Nle-c[Asp-Phe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 487);

[3142] Ac-Nle-c[Asp-Bip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 489);

[3143] Ac-Nle-c[Asp-Trp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 493);

[3144] Ac-Nle-c[Asp-Tyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 495);

[3145] Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

[3146] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

[3147] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

[3148] Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

[3149] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

[3150] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

[3151] Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

[3152] Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

[3153] Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

[3154] Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

[3155] Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);

[3156] Ac-Nle-c[Asp-dPhe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 526);

[3157] Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);

[3158] Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

[3159] Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);

[3160] Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);

[3161] Ac-Nle-c[Asp-dTyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 534);

[3162] Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);

[3163] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);

[3164] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

[3165] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

[3166] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);

[3167] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);

[3168] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);

[3169] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);

[3170] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);

[3171] Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

[3172] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);

[3173] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);

[3174] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 549);

[3175] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

[3176] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);

[3177] Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);

[3178] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);

[3179] Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

[3180] Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);

[3181] Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

[3182] Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

[3183] Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);

[3184] Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

[3185] Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);

[3186] Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561);

[3187] Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);

[3188] Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);

[3189] Ac-Nle-c[Asp-dPhe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 564);

[3190] Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);

[3191] Ac-Nle-c[Asp-dBip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 566);

[3192] Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);

[3193] Ac-Nle-c[Asp-dGln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 568);

[3194] Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);

[3195] Ac-Nle-c[Asp-dTrp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 570);

[3196] Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571); and

[3197] Ac-Nle-c[Asp-dTyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 572),

[3198] wherein c represents cyclization through R^2 and R^7 via a lactam bond or a disulfide bond.

[3199] 84. The method or the use of any one of embodiments 1-83, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572.

[3200] 85. The method or the use of embodiment 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206,

215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, 571-572.

[3201] 86. The method or the use of embodiment 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, 571-572.

[3202] 87. The method or the use of embodiment 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350.

[3203] 88. The method or the use of embodiment 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, 538-561.

[3204] 89. The method or the use of embodiment 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, 556-561.

[3205] 90. The method or the use of embodiment 89, wherein the non-naturally occurring melanocortin analog comprises a sequence of SEQ ID NO: 3.

[3206] 91. The method or the use of any one of embodiments 1-90, wherein the non-naturally occurring melanocortin analog is present in a pharmaceutical composition.

[3207] 92. The method or the use of embodiment 91, wherein the pharmaceutical composition comprises one or more pharmaceutically acceptable excipients and/or carriers.

[3208] 93. The method or the use of embodiment 92, wherein the one or more pharmaceutically acceptable excipients and/or carriers of the pharmaceutical composition comprise water.

[3209] 94. The method or the use of any one of embodiments 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg to about 20 mg/kg administered once a day for about 5 days to about 10 days; (ii) at a second dose of about 10 mg/kg to about 40 mg/kg administered once a day after administration of the first dose for about 5 days to about 10 days; (iii) at a third dose of about 5 mg/kg to about 30 mg/kg administered twice a day after administration of the second dose for at least about 5 days to about 10 days.

[3210] 95. The method or the use of any one of embodiments 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 15 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 10 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

[3211] 96. The method or the use of any one of embodiments 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 10 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 20 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 15 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

[3212] 97. The method or the use of any one of embodiments 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 15 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 25 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 20 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

[3213] 98. The method or the use of any one of embodiments 1-93, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.5 mg/kg to about 10 mg/kg per body weight of the subject once daily.

[3214] 99. The method or the use of embodiment 98, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 1 mg/kg or 3 mg/kg per body weight of the subject once daily.

[3215] 100. The method or the use of any one of embodiments 1-93, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.1 mg to about 100 mg once daily.

[3216] 101. The method or the use of any one of embodiments 1-95, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg or about 50 mg once daily.

[3217] 102. The method or the use of any one of embodiments 1-101, wherein the non-naturally occurring melanocortin analog is administered via intraperitoneal, intravenous, parenteral, subcutaneous, intramuscular, intracerebroventricular, intranasal, or oral administration.

[3218] 103. The method or the use of any one of embodiments 1-102, wherein the non-naturally occurring melanocortin analog crosses a blood-brain-barrier of a subject.

[3219] 104. The method or the use of any one of embodiments 101 or 102, wherein the non-naturally occurring melanocortin analog comprises a sequence of SEQ ID NO: 3 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg per body weight of the subject.

[3220] 105. The method or the use of embodiment 104, wherein the non-naturally occurring melanocortin analog comprises a sequence of SEQ ID NOs: 3 and is administered at least once daily in an amount ranging from 0.5 mg/kg to 10 mg/kg per body weight of the subject.

[3221] 106. The method or the use of any one of embodiments 1-105, wherein the non-naturally occurring melanocortin analog is administered to a subject for at least 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, or 5 years.

[3222] 107. The method or the use of any one of embodiments 1-105, wherein the non-naturally occurring melanocortin analog is administered to a subject for 1 day, 5 days, 7 days, 14 days, 21 days, 28 days, 35 days, 40 days, 45 days, 50 days, 60 days, 75 days, 90 days, 100 days, 110 days, or 120 days.

[3223] 108. The method or the use of any one of embodiments 1-107, wherein the method or the use further comprises maintaining muscle mass or promoting muscle mass gain in the subject.

CLAIMS

I/We claim:

1. A method of increasing body weight in a subject in need thereof, comprising administering to the subject

a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-

amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine ($p(CF_3)$dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

2. Use of a non-naturally occurring melanocortin analog for increasing body weight in a subject in need thereof, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-

bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

3. The method or the use of claim 1 or 2, wherein the method further comprises reducing lean mass loss, maintaining lean mass, or promoting lean mass gain in the subject.

4. The method of the use of claim 3, wherein the lean mass is lean muscle mass.

5. The method or the use of any one of claims 1 to 4, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.5 mg/kg to about 10 mg/kg per body weight of the subject once daily.

6. The method or the use of claim 5, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 1 mg/kg or 3 mg/kg per body weight

of the subject once daily.

7. The method or the use of any one of claims 1 to 4, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.1 mg to about 100 mg once daily.

8. The method or the use of any one of claims 1 to 4, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg or about 50 mg once daily.

9. The method or the use of any one of claims 1 to 6, wherein the non-naturally occurring melanocortin analog is an antagonist of a melanocortin 4 receptor.

10. The method or the use of claim 9, wherein the non-naturally occurring melanocortin analog is a full antagonist of the melanocortin 4 receptor.

11. The method or the use of claim 9, wherein the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 4 receptor.

12. The method or the use of any one of claims 1 to 11, wherein the non-naturally occurring melanocortin analog is an antagonist of a melanocortin 3 receptor.

13. The method or the use of claim 12, wherein the non-naturally occurring melanocortin analog is a full antagonist of the melanocortin 3 receptor.

14. The method or the use of claim 12, wherein the non-naturally occurring melanocortin analog is a partial antagonist of the melanocortin 3 receptor.

15. The method or the use of any one of claims 1 to 11, wherein the non-naturally occurring melanocortin analog is an agonist of the melanocortin 3 receptor.

16. The method or the use of claim 15, wherein the non-naturally occurring melanocortin analog is a full agonist of the melanocortin 3 receptor.

17. The method or the use of claim 15, wherein the non-naturally occurring melanocortin analog is a partial agonist of the melanocortin 3 receptor.

18. The method or the use of claim 15, wherein the non-naturally occurring melanocortin analog has no melanocortin 3 receptor activity.

19. The method or the use of any one of claims 1 to 18, wherein the method or the use further comprises preventing or reducing one or more side effects associated with a metabolic disorder, relative to a control.

20. A method of preventing or reducing cachexia in a subject in need thereof relative to a control, comprising administering to the subject:

a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-

glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;
when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and
when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

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21. Use of a non-naturally occurring melanocortin analog for preventing or reducing cachexia in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}R^9\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \quad (I),$$

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

22. A method of preventing or reducing anorexia in a subject in need thereof relative to a control, comprising administering to the subject:

a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-R^9-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (I),

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-

amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

23. Use of a non-naturally occurring melanocortin analog for preventing or reducing anorexia in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}R^9\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \quad (I),$$

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

24. A method of increasing, maintaining, or reducing a loss in a body mass index (BMI) level in a subject in need thereof relative to a control, comprising administering to the subject:

a non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}R^9\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \quad (I),$$

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;
when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;
when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');
when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;
when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and
when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

25. Use of a non-naturally occurring melanocortin analog for increasing, maintaining, or reducing a loss in a BMI level in a subject in need thereof relative to a control, the non-naturally occurring melanocortin analog comprising a sequence of Formula (I):

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}R^9\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \quad (I),$$

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-

phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;
when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and
when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

26. The method or the use of any one of claims 1-25, wherein the method or the use prevents fat mass gain after administration of the non-naturally occurring melanocortin analog, relative to a control.

27. The method or the use of any one of claims 1-26, wherein the method or the use reduces increases a fat mass level after administration of the non-naturally occurring melanocortin analog, relative to a control.

28. The method or the use of any one of claims 1-27, wherein the method or the use maintains or increases brain mass in the subject during or after administration of the non-naturally occurring melanocortin analog, relative to a control.

29. The method or the use of any one of claims 1-27, wherein the method or the use prevents or reduces brain mass loss in the subject during or after administration of the non-naturally occurring melanocortin analog, relative to a control.

30. The method or the use of any one of claims 1-29, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (I):

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}R^9\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \quad (I),$$

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), and D-lysine (dLys);

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^3 is dTrp or Phe, then R^4 is not dNal(2') and R^6 is not dPhe;

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then (i) R^3 is dBip or (ii) R^3 is Pro, R^2 is not Trp, and either R^5 is Lys or R^6 is dNal(2') or Nal(2');

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, Phe, dPhe, Bip, Gln, Trp, Tyr, dTyr, and Pro, R^2 is not Trp, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

31. The method or the use of any one of claims 1-29, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (I), wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-

glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, D-tryptophan (dTrp), Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of Pro, dPhe, 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Arg, Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is selected from the group consisting of Trp, Lys, and dPen;

R^9 is absent or Lys;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

Ac-Nle-c[Asp-dTrp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 83);

Ac-Nle-c[Asp-Phe-Phe-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 420);

Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 223);

Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 460);

Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 464);

Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 465);

Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 466);

Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 467);
Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 468);
Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 469);
Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 470);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 474);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 475);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 476);
Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 477);
Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 478);
Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 481);
Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 482);
Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 483);
Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 484);
Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 485);
Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 459);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 472);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 471);
Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 463);
Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 462);
Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 479);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 473);
Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 480);
Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 486);
Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 491);
Ac-Nle-c[dCys-His-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 461);
Ac-Nle-c[Asp-dGln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 492);
Ac-Nle-c[Asp-dTyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 496);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 218);
Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 442);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 449);
Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 455);

Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 447);
Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 438);
Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 450);
Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 435);
Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 439);
Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 441);
Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 436);
Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 454);
Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 452);
Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 451);
Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 456);
Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 437);
Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 440);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 448);
Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 457);
Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 453);
Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 458);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 446);
Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 433);
Ac-Nle-c[dCys-Pro-p(F)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 434);
Ac-Nle-c[Asp-dPhe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 488);
Ac-Nle-c[Asp-dBip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 490);
Ac-Nle-c[Asp-dTrp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 494);
Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 443);
Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 268);
Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 363);
Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 365);
Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 370);
Ac-Nle-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 378);

Ac-dArg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 379);

Ac-Nle-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 380);

Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 418);

Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 621);

Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 666);

Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 297);

Ac-Nle-c[Asp-His-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 228);

Ac-Nle-c[Asp-His-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 229);

Ac-Arg-c[Asp-dAla-His-dPhe-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 281);

Ac-Nle-c[Asp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 355);

Ac-Nle-c[Asp-Tic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 362);

Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 424);

Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 366);

Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 368);

Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dLeu-dPro-NH_2 (SEQ ID NO: 422);

Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 372);

Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 374);

Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 639);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 352);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 351);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Trp-NH_2 (SEQ ID NO: 600);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 322);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dAsn-NH_2 (SEQ ID NO: 605);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Gly-Gly-NH_2 (SEQ ID NO: 610);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-NH_2 (SEQ ID NO: 581);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 353);

Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 319);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-dPro-NH_2 (SEQ ID NO: 607);

Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 638);

Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 295);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 575);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 587);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-NH_2 (SEQ ID NO: 582);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Pro-Val-NH_2 (SEQ ID NO: 588);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-dPro-NH_2 (SEQ ID NO: 612);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Pro-Val-NH_2 (SEQ ID NO: 583);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Ala-Ala-NH_2 (SEQ ID NO: 609);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dTle-NH_2 (SEQ ID NO: 594);

Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 631);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Arg-Val-Pro-NH_2 (SEQ ID NO: 589);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 597);

Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 628);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 591);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 590);

Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 311);

Ac-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 629);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Hyp-NH_2 (SEQ ID NO: 574);

Ac-dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 303);

Ac-Nle-c[Asp-Oic-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 360);

Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 313);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291);

Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 299);

Phe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 305);

His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 306);

Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 312);

Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 314);

Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 315);

Ac-Nle-c[dCys-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 321);

Ac-Nle-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 423);

Ac-Nle-Phe-Phe-c[Asp-Phe-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 421);

Ac-Nle-c[Cys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 383);

Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 384);

Ac-Lys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 387);

Ac-Arg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 389);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 403);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 407);

Ac-Nle-c[Asp-Trp-Leu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 395);

Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 633);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-Pro-NH_2 (SEQ ID NO: 573);

Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 643);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Val-NH_2 (SEQ ID NO: 576);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Pro-NH_2 (SEQ ID NO: 577);

dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 309);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 593);

Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 632);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-NH_2 (SEQ ID NO: 603);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 620);

Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 634);

Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 635);

Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 644);

Ac-dTyr-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 304);

Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 642);

dPhe-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 308);

Ac-Nle-c[Asp-Atc-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 212);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 226);

Ac-Nle-c[dPen-Pro-dPhe-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 320);

Ac-Nle-c[Cys-dPhe-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 324);

Ac-Nle-c[Asp-Cpe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 358);

Ac-Nle-c[Asp-Che-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 359);

Ac-Nle-c[Asp-dPhe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 367);

Ac-Nle-c[Asp-dGln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 371);

Ac-Nle-c[Asp-dTrp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 373);

Ac-Nle-c[Asp-dTyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 375);

Ac-Arg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 381);

Ac-dArg-c[Asp-Ala-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 382);

Ac-Nle-c[dCys-Trp-Pro-dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 385);

Ac-Ala-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 386);

Ac-dLys-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 388);

Ac-dArg-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 390);

Ac-dHis-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 391);

Ac-His-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 392);

Ac-Nle-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 393);

Ac-Nle-c[Asp-Trp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 394);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 405);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 406);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 408);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 409);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 410);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 411);

Ac-Nle-c[Asp-Phe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 412);

Ac-Nle-c[Asp-His-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 413);

Ac-Nle-c[Asp-Tyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 414);

Ac-Nle-c[Asp-dPhe-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 415);

Ac-Nle-c[Asp-dHis-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 416);

Ac-Nle-c[Asp-dTyr-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 417);

Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 419);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 596);

Ac-Nle-c[dAsp-Pro-dPhe-Arg-Trp-dLys]-dPro-dVal-NH_2 (SEQ ID NO: 622);

Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 645);

Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 646);

Ac-dLeu-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 298);

Ac-Nle-c[Asp-Ala-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 354);

Ac-Nle-c[Asp-Hyp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 364);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Arg-NH_2 (SEQ ID NO: 578);

Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 300);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dArg-NH_2 (SEQ ID NO: 579);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 580);

Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 640);

Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 641);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 584);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-Val-Pro-NH_2 (SEQ ID NO: 585);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2 (SEQ ID NO: 586);

Ac-dNle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 301);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 595);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 598);

Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 302);

Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 630);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2 (SEQ ID NO: 601);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAla-dAla-NH_2 (SEQ ID NO: 602);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dHyp-NH_2 (SEQ ID NO: 604);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-Asp-NH_2 (SEQ ID NO: 606);

Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 318);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Hyp-NH_2 (SEQ ID NO: 608);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asp-dPro-NH_2 (SEQ ID NO: 611);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Asn-NH_2 (SEQ ID NO: 613);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsp-NH_2 (SEQ ID NO: 614);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dAsn-NH_2 (SEQ ID NO: 615);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-Lys-dPro-NH_2 (SEQ ID NO: 616);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 599);

Ac-Nle-c[Asp-Pro-His-Phe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 296);

Ac-Nle-c[Asp-Aba-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 198);

Ac-Nle-c[Asp-Aia-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 207);

Ac-Nle-c[Asp-Ata-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 208);

Ac-Nle-c[Asp-Pro-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 225);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2 (SEQ ID NO: 592);

Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 425);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 427);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 429);

Ac-Nle-c[Pen-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 325);

Ac-Nle-c[dPen-dPhe-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 326);

Ac-Nle-c[Asp-dIle-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 356);

Ac-Nle-c[Asp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 357);

Ac-Arg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 376);

Ac-dArg-c[Asp-dAla-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 377);

Ac-Nle-c[Asp-Trp-dLeu-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 396);

Ac-Nle-c[Asp-Trp-dVal-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 397);

Ac-Nle-c[Asp-Trp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 398);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 400);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Phe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 401);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-dPhe-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 402);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 399);

Ac-Nle-c[Asp-Trp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 404);

Ac-Nle-c[Asp-Pro-dPhe-Arg-dTrp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 187);

Ac-Nle-c[Asp-Pro-dPhe-transPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 231);

Ac-Nle-c[Asp-Pro-dPhe-cisPro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 232);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 233);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 234);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 235);

Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(1')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 428);

Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

Ac-Nle-c[Asp-dTrp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 532);

Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 209);

Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 210);

Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 211);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

32. The method or the use of any one of claims 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA):

X^1-X^2-X^3-R^1-R^2-R^3-R^4-R^5-R^6-R^7-R^8-Y^1-Y^2-Y^3-Y^4-Y^5-Y^6-Y^7 (IA),

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is Lys or dPen;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTIe, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

a lactam bridge between R^1 and R^7 or R^8 when R^1 is Asp and R^7 or R^8 is Lys;

provided that:

when R^4 is p(Br)dPhe, then R^1 is Nle or Ala, Y^4-Y^7 are absent, and at least one of X^1 and Y^3 is absent;

when R^4 is p(Cl)dPhe, then (i) R^3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro or (ii) R^3 is His and R^6 is not Trp;

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^2 is not Pro.

33. The method or the use of any one of claims 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA), wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), D-biphenylalanine (dBip);

R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is Lys or dPen;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);

Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);

Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);

Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);

Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);

Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);

Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561);

Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

Ac-Nle-c[Asp-Aba-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 209);

Ac-Nle-c[Asp-Aia-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 210);

Ac-Nle-c[Asp-Ata-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 211);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);

Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and

Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

34. The method or the use of any one of claims 1-30 and 32, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA), wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent or Nle;

X^3 is absent or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu);

R^2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, β-alanine (β-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip);

R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine ($p(CF_3)$dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is Lys or dPen;

Y^1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when R^4 is p(Br)dPhe, then R^1 is Nle or Ala, R^5 is Arg, Y^4-Y^7 are absent, and at least one of X^1 and Y^3 is absent;

when R^4 is p(Cl)dPhe, then R^3 is selected from Phe, dPhe, Bip, Trp, Tyr, dTyr, and Pro; and

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is Pro and R^1 is not dArg, Arg, dTyr, or Ala, (ii) R^3 is His and R^2 and R^7 are both Cys, or (iii) R^3 is absent, R^2 is Pen, and R^7 is dCys.

35. The method or the use of any one of claims 1-29 and 33, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IA), wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent or Nle;

X^3 is absent or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), and glutamic acid (Glu);

R^2 is selected from the group consisting of dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, glutamine (Gln), dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, Tyr, dTyr, 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 1-amino-1-cyclopentane carboxylic (Cpe), biphenylalanine (Bip), and D-biphenylalanine (dBip);

R^4 is selected from the group consisting of 2'-D-naphthylalanine (dNal(2')), para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, and ornithine (Orn);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, dNal(2'), 2'-naphthylalanine (Nal(2')), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is selected from the group consisting of Gly, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is Lys or dPen;

Y^1 is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);

Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);

Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);

Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);

Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);

Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);

Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);

Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);

Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);

Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);

Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);

Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

Ac-Nle-c[Asp-dBip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 528);

Ac-Nle-c[Asp-dGln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 530);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511);

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515);

Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 329);

Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 330);

Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 332);

Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 333);

Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 536);

Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 498);

Ac-Nle-c[dCys-His-p(Cl)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 499);

Ac-Nle-c[dCys-His-p(Br)dPhe-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 537);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);

Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);

Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62); and

Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63).

36. The method or the use of any one of claims 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IB):

$$X^1\text{-}X^2\text{-}X^3\text{-}R^1\text{-}R^2\text{-}R^3\text{-dNal(2')-}R^5\text{-}R^6\text{-}R^7\text{-}R^8\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4\text{-}Y^5\text{-}Y^6\text{-}Y^7 \text{ (IB)},$$

wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle), norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-

glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is Lys or dPen;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTle, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn;

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that:

when the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between R^2 and R^7, then (i) R^3 is not Ala, Leu, dLeu, dVal, or Gly, and if R^3 is absent, then R^2 is Pen and R^7 is dCys; and

when R^7 is Pro or Gly, then (i) R^3 is not His or (ii) R^3 is His and R^2 is Glu.

37. The method or the use of any one of claims 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IB), wherein:

X^1 is absent or is selected from the group consisting of norleucine (Nle), arginine (Arg) and D-arginine (dArg);

X^2 is absent, phenylalanine (Phe), or Nle;

X^3 is absent, Phe, or Nle;

R^1 is absent or is selected from the group consisting of Arg, dArg, Nle, D-norleucine (dNle), aspartic acid (Asp), D-methionine (dMet), D-isoleucine (dIle), D-leucine (dLeu), D-valine (dVal), D-alanine (dAla), alanine (Ala), tert-leucine (Tle), D-tert-leucine (dTle),

norvaline (Nva), glycine (Gly), D-proline (dPro), *cis*-4-guanidinyl-proline (*cis*Pro(guan)), *trans*-4-guanidinyl-proline (*trans*Pro(guan)), cysteine (Cys), D-cysteine (dCys), D-phenylalanine (dPhe), D-tyrosine (dTyr), tyrosine (Tyr), dimethyl-tyrosine (Dmt), D-glutamine (dGln), D-asparagine (dAsn), glutamic acid (Glu), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is selected from the group consisting of Phe, dAla, Ala, Gly, Asp, D-aspartic acid (dAsp), Cys, dCys, penicillamine (Pen), D-penicillamine (dPen), glutamic acid (Glu), CO-*cis*-CH=CH-CO, proline (Pro), and tryptophan (Trp);

R^3 is absent or is selected from the group consisting of Phe, dPhe, His, dHis, Glu, Pro, hydroxyproline (Hyp), Ala, dAla, b-alanine (b-Ala), dMet, Gly, dGln, leucine (Leu), dLeu, isoleucine (Ile), dIle, valine (Val), dVal, Trp, *cis*Pro(guan), *trans*Pro(guan), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3-aminomethylbenzoic acid (Mamb), 1-aminocyclo-propane-1-carboxylic acid (Acpc), 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), octohydroindole-2-carboxylic acid (Oic), 1-amino-1-cyclohexanecarboxylic acid (Che), tetrahydro-isoquinoline-3-carboxylic acid (Tic), 2-aminoindone-2-carboxylic acid (Aic), and 1-amino-1-cyclopentane carboxylic (Cpe);

R^5 is absent or is selected from the group consisting of Arg, His, Ala, Glu, Lys, ornithine (Orn), *cis*Pro(guan), and *trans*Pro(guan);

R^6 is selected from the group consisting of Trp, dTrp, Tyr, dTyr, Phe, dPhe, Aia, Aba, Ata, dNal(2'), 1'-D-naphthylalanine (dNal(1')), and 1'-naphthylalanine (Nal(1'));

R^7 is absent or is selected from the group consisting of Gly, Pro, Lys, dLys, Cys, dCys, Pen, dPen, Orn, and D-ornithine (dOrn);

R^8 is absent or is Lys or dPen;

Y^1 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, D-hydroxyporline (dHyp), dTle, dLeu, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, dAsn, asparagine (Asn), Lys, dLys, and Trp;

Y^2 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Hyp, dHyp, dTIe, Ala, dAla, Gly, Asp, dAsp, Arg, dArg, Asn, and dAsn;

Y^3 is absent or is selected from the group consisting of Val, dVal, Pro, dPro, Lys, and dLys;

Y^4 is absent or is selected from the group consisting of dVal, dPro, Asp, and dAsp;

Y^5 is absent or dVal;

Y^6 is absent or dVal;

Y^7 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between R^1 or R^2 and R^7 or R^8 when each of R^1 or R^2 and R^7 or R^8 are independently selected from the group consisting of Cys, dCys, Pen and dPen;

a lactam bridge between R^2 and R^7 or R^8 when R^2 is selected from the group consisting of Asp, dAsp, Glu, and CO-*cis*-CH=CH-CO and R^7 or R^8 is selected from the group consisting of Lys, dLys, Orn, and dOrn; and

a lactam bridge between R^1 and any one of R^7-R^9 when R^1 is Asp and any one of R^7-R^9 is Lys;

provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

Ac-Nle-c[dPen-Ala-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 338);

Ac-Nle-c[dPen-Leu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 339);

Ac-Nle-c[dPen-dLeu-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 340);

Ac-Nle-c[dPen-dVal-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 341);

Ac-Nle-c[dPen-Gly-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 342);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 44);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 45);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 46);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 47);

Ac-Nle-c[Cys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 56);

Ac-Nle-c[dCys-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 57);
Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 58);
Ac-Nle-c[Pen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 60);
Ac-Nle-c[dPen-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 61);
Ac-Nle-c[dPen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 62);
Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 63);
Ac-Nle-c[Asp-His-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 8); and
Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 258).

38. The method or the use of any one of claims 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IC):

$$X^1\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4 \text{ (IC)},$$

wherein:

X^1 is absent or norleucine (Nle)

R^1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys);

R^2 is aspartic acid (Asp) or cysteine (Cys);

R^3 is His or proline (Pro);

R^4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

R^5 is Arg or His;

R^6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2'));

R^7 is Lys or Cys;

Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

Y^2 is selected from the group consisting of dVal, dPro, and dTle;

Y^3 is absent or is dVal or dPro;

Y^4 is absent or dPro; and

the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of:

a disulfide bond between Cys at R^2 and Cys R^7; and

a lactam bridge between Asp at R^2 and Lys at R^7;

provided that:

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, Y^4-Y^7 are absent, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent.

39. The method or the use of any one of claims 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (IC), wherein:

$$X^1\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4 \text{ (IC)},$$

wherein:

X^1 is absent or norleucine (Nle)

R^1 is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys);

R^2 is aspartic acid (Asp) or cysteine (Cys);

R^3 is His or proline (Pro);

R^4 is selected from the group consisting of para-chloro-D-phenylalanine (p(Cl)dPhe), para-iodo-D-phenylalanine (p(I)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-trifluoromethyl-D-phenylalanine (p(CF_3)dPhe);

R^5 is Arg or His;

R^6 is selected from the group consisting of tryptophan (Trp), 4-amino-1,2,4,5-tetrahydro-2-benzazepin-3-one (Aba), 3- 7-amino-7,8-dihydro-4H-[1,2,3]triazolo-[1,5-a][1,4]diazepin-6(5H)-one (Ata), 4-amino-1,4,5,6-tetrahydroazepino[4,3-*b*]indol-3(*2H*)-one (Aia), 2'-D-naphthylalanine dNal(2'), and 2'-naphthylalanine (Nal(2'));

R^7 is Lys or Cys;

Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

Y^2 is selected from the group consisting of dVal, dPro, and dTle;

Y^3 is absent or is dVal or dPro;

Y^4 is absent or dPro; and

the non-naturally occurring melanocortin analog is cyclized through a moiety selected from the group consisting of:

a disulfide bond between Cys at R^2 and Cys R^7; and

a lactam bridge between Asp at R^2 and Lys at R^7;

provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);

Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);

Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);

Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);

Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);

Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);

Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);

Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);

Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513);

Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 511); and

Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515).

40. The method or the use of any one of claims 1-30, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (ID):

$$X^1\text{-}R^1\text{-}R^2\text{-}R^3\text{-}R^4\text{-}R^5\text{-}R^6\text{-}R^7\text{-}Y^1\text{-}Y^2\text{-}Y^3\text{-}Y^4 \text{ (ID)},$$

wherein:

X^1 is absent or norleucine (Nle);

R^1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is aspartic acid (Asp) or cysteine (Cys);

R^3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip);

R^4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is selected from the group consisting of Arg, Lys, and His;

R^6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2'));

R^7 is Lys or Cys;

Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

Y^2 is dVal or dPro;

Y^3 is absent, dVal, or dPro;

Y^4 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between Cys at R^2 and Cys at R^7; and

a lactam bridge between Asp at R^2 and Lys at R^7;

provided that:

when R^4 is p(Br)dPhe and R^1 is Nle or Ala, then the C-terminus is not dVal-dPro or dTle-dPro and if the C-terminus is dPro-dVal-dPro, then X^1 is present.

when R^4 is p(F)dPhe, then (i) R^3 is selected from Phe, Bip, Trp, and Tyr or (ii) R^3 is Pro and R^5 is Lys, R^6 is dNal(2') or Nal(2'), or the non-naturally occurring melanocortin analog is cyclized through a disulfide bond between Cys at R^2 and Cys at R^7;

when R^4 is dPhe, then R^3 is Pro and either R^5 is Lys or R^6 is dNal(2') or Nal(2'); and

when R^4 is p(Cl)dPhe, then R^1 is Nle or Ala, R^3 is selected from His, dHis, and Gln, R^6 is Trp, and either X^1 and Y^3 are both present or X^1 and Y^3 are both absent.

41. The method or the use of any one of claims 1-29 and 31, wherein the non-naturally occurring melanocortin analog comprises a sequence according to Formula (ID), wherein:

R^1 is absent or is selected from the group consisting of Nle, arginine (Arg), D-arginine (dArg), alanine (Ala), histidine (His), D-histidine (dHis), lysine (Lys), D-lysine (dLys)

R^2 is aspartic acid (Asp) or cysteine (Cys);

R^3 is selected from the group consisting of His, D-histidine (dHis), proline (Pro), phenylalanine (Phe), tryptophan (Trp), tyrosine (Tyr), glutamine (Gln), and biphenylalanine (Bip);

R^4 is selected from the group consisting of dPhe, para-chloro-D-phenylalanine (p(Cl)dPhe), para-bromo-D-phenylalanine (p(Br)dPhe), and para-fluoro-D-phenylalanine (p(F)dPhe);

R^5 is selected from the group consisting of Arg, Lys, and His;

R^6 is selected from the group consisting of Trp, 2'-D-naphthylalanine (dNal(2')), and 2'-naphthylalanine (Nal(2'));

R^7 is Lys or Cys;

Y^1 is selected from the group consisting of D-valine (dVal), D-proline (dPro), and D-tert-leucine (dTle);

Y^2 is dVal or dPro;

Y^3 is absent, dVal, or dPro;

Y^4 is absent or dPro; and

the non-naturally occurring melanocortin analog is optionally cyclized through a moiety selected from the group consisting of:

a disulfide bond between Cys at R^2 and Cys at R^7; and

a lactam bridge between Asp at R^2 and Lys at R^7;

provided that the non-naturally occurring melanocortin analog does not comprise a sequence selected from the group consisting of:

Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);

Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);

Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);

Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);

Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);

Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);

Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571);

Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);

Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);

Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);

Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);
Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);
Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);
Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 223);
Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 464);
Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 465);
Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 466);
Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 467);
Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 468);
Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 469);
Ac-Nle-c[Asp-His-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 470);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 474);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 475);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 476);
Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 477);
Ac-Nle-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 478);
Ac-Arg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 481);
Ac-Lys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 482);
Ac-dLys-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 483);
Ac-His-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 484);
Ac-dHis-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 485);
Ac-Nle-c[Cys-His-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 459);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 472);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 471);
Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 463);
Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 462);

Ac-Ala-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 479);
Ac-Nle-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 473);
Ac-dArg-c[Asp-His-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 480);
Ac-Nle-c[Asp-dHis-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 486);
Ac-Nle-c[Asp-Gln-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 491);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 218);
Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 442);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 449);
Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 455);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 447);
Ac-Lys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 438);
Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 450);
Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 435);
Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 439);
Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 441);
Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 436);
Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 454);
Ac-Ala-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 452);
Ac-Nle-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 451);
Ac-dLys-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 456);
Ac-Arg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 437);
Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 440);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 448);
Ac-His-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 457);
Ac-dArg-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 453);
Ac-dHis-c[Asp-Pro-p(F)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 458);
Ac-Nle-c[Asp-Pro-p(F)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 443);
Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 363);
Ac-Nle-c[Asp-dHis-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 365);
Ac-Nle-c[Asp-Gln-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 370);
Ac-Nle-c[Asp-His-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 621);

Ac-Nle-c[Asp-Pro-His-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 297);
Ac-Nle-c[Asp-Phe-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 366);
Ac-Nle-c[Asp-Bip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 368);
Ac-Nle-c[Asp-Trp-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 372);
Ac-Nle-c[Asp-Tyr-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 374);
Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 639);
Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 638);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 295);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 597);
Ac-Nle-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 628);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 591);
Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 311);
Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 313);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 291);
Ac-dAla-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 299);
His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 306);
Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 312);
Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 314);
Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 315);
Ac-Lys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 643);
dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 309);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 617);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 620);
Ac-dLys-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 644);
Ac-Arg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 642);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 596);
Ac-His-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 645);
Ac-dHis-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 646);
Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 300);
Ac-Ala-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 640);
Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 641);

Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 595);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 598);
Ac-dArg-c[Asp-Pro-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 302);
Ac-Nle-c[Asp-Pro-dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 425);
Ac-Nle-c[Cys-Pro-dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 318);
Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);
Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);
Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);
Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);
Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);
Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 520);
Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 522);
Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 523);
Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 518);
Ac-Lys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 503);
Ac-His-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 505);
Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 502);
Ac-Arg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 519);
Ac-dHis-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 506);
Ac-dArg-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 501);
Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 521);
Ac-dLys-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 504);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 512);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 513); and
Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 515).

42. The method or the use of any one of claims 1-41, wherein an N-terminus of the non-naturally occurring melanocortin analog, if present, is modified by an acyl group.

43. The method or the use of claim 42, wherein the acyl group is an acetyl group.

44. The method or the use of any one of claims 1-41, wherein an N-terminus of the non-naturally occurring melanocortin analog, if present, is not modified.

45. The method or the use of any one of claims 1-44, wherein a C-terminus of the non-naturally occurring melanocortin analog is modified by an amide group.

46. The method or the use of any one of claims 1-44, wherein a C-terminus of the non-naturally occurring melanocortin analog is not modified.

47. The method or the use of any one of claims 1-46, wherein R^4 is dNal(2').

48. The method or the use of any one of claims 1-47, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized.

49. The method or the use of any one of claims 1-48, wherein R^3 is Pro, Hyp, or His.

50. The method or the use of any one of claims 1-49, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro (SEQ ID NO: 2);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 3);
Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 4);
Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 5);
Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dLeu-dPro-NH_2 (SEQ ID NO: 6);
Ac-Nle-c[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 7);
Ac-Nle-c[Asp-Hyp-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 9); and
Ac-Nle-c[Asp-Pro-His-dNal(2')-Arg-Trp-Lys]-dPro-dVal-NH_2 (SEQ ID NO: 10),
wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond.

51. The method or the use of any one of claims 1-48, wherein R^9 is present.

52. The method or the use of any one of claims 1-48 and 51, wherein the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-c[Asp-Phe-Phe-Pro-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 11), wherein c represents cyclization through R^1 and R^9 via a lactam bond.

53. The method or the use of any one of claims 1-48, wherein R^9 is absent and X^1-X^3 are present.

54. The method or the use of any one of claims 1-48 and 53, wherein the sequence of any one of Formulae (I)-(ID) is: Ac-Nle-Phe-Phe-$_c$[Asp-Phe-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 12), wherein c represents cyclization through R^1 and R^8 via a lactam bond.

55. The method or the use of any one of claims 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized between R^2 and R^7 via a lactam bond or a disulfide bond.

56. The method or the use of any one of claims 1-48 and 55, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[dAsp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 38);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dLys]-dVal-dPro-NH_2 (SEQ ID NO: 39);
Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 40);
Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 41);
Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 42);
Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 43);
Ac-Nle-c[Cys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 48);
Ac-Nle-c[dCys-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 49);
Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 50);
Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 51);

Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 52);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Pen]-dVal-dPro-NH_2 (SEQ ID NO: 53);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 54);
Ac-Nle-c[Pen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 55);
Ac-Nle-c[Pen-dNal(2')-Arg-Trp-dCys]-dVal-dPro-NH_2 (SEQ ID NO: 59);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 64);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2 (SEQ ID NO: 65);
Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-Orn]-dVal-dPro-NH_2 (SEQ ID NO: 66);
Ac-Nle-c[Glu-Pro-dNal(2')-Arg-Trp-dOrn]-dVal-dPro-NH_2 (SEQ ID NO: 67); and
c[CO-cis-CH = CH-CO-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 197),
wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond or a disulfide bond.

57. The method or the use of any one of claims 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized through a lactam bond between Asp at R^1 or R^2 and Lys at R^7.

58. The method or the use of any one of claims 1-48 and 57, wherein R^1 is selected from the group consisting of dArg, dMet, dIle, dLeu, dVal, dAla, Ala, Tle, dTle, dNle, Nva, Gly, dPro, dCys, dPhe, dGln, dAsn, *trans*Pro(guan), *cis*Pro(guan), dTyr, Tyr, and Dmt.

59. The method or the use of any one of claims 1-48, 57, and 58, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-dArg-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 15);
Ac-dMet-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 16);
Ac-dIle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 17);
Ac-dLeu-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 18);
Ac-dVal-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 19);
Ac-dAla-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 20);
Ac-Ala-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 21);
Ac-Tle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 22);

Ac-dTle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 23);
Ac-dNle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 24);
Ac-Nva-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 25);
Ac-Gly-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 26);
Ac-dPro-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 27);
Ac-dCys-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 28);
Ac-dPhe-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 29);
Ac-dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 30);
Ac-dGln-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 31);
Ac-dAsn-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH2 (SEQ ID NO: 32);
Ac-*trans*Pro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 33);
Ac-*cis*Pro(guan)-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 34);
dTyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 35);
Tyr-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 36); and
Dmt-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 37),
wherein c represents cyclization through R^2 and R^7 via a lactam bond.

60. The method or the use of any one of claims 1-48 and 57, wherein R^3 is absent or selected from the group consisting of Ala, dAla, dMet, Gly, Leu, Ile, Val, dLeu, dIle, dVal, Trp, *trans*Pro(guan), *cis*Pro(guan), β-Ala, Mamb, Acpc, Aba, Aia, Aic, Cpe, Che, Oic, Tic, and Glu.

61. The method or the use of any one of claims 1-48, 57, and 60, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 68);
Ac-Nle-c[Asp-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 69);
Ac-Nle-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 71);
Ac-Nle-c[Asp-dMet-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 72);
Ac-Nle-c[Asp-Pro-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 73);
Ac-Nle-c[Asp-Gly-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 74);
Ac-Nle-c[Asp-Gly-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 75);

Ac-Nle-c[Asp-Leu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 76);
Ac-Nle-c[Asp-Ile-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 77);
Ac-Nle-c[Asp-Val-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 78);
Ac-Nle-c[Asp-dLeu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 79);
Ac-Nle-c[Asp-dIle-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 80);
Ac-Nle-c[Asp-dVal-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 81);
Ac-Nle-c[Asp-Trp-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 82);
Ac-Nle-c[Asp-*trans*Pro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 84);
Ac-Nle-c[Asp-*cis*Pro(guan)-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 85),
Ac-Nle-c[Asp-β-Ala-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 199);
Ac-Nle-c[Asp-Mamb-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 200);
Ac-Nle-c[Asp-Acpc-dNal(2') Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 201);
Ac-Nle-c[Asp-Aba-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 204);
Ac-Nle-c[Asp-Aia-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 205);
Ac-Nle-c[Asp-Aic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 239);
Ac-Nle-c[Asp-Cpe-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 240);
Ac-Nle-c[Asp-Che-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 241);
Ac-Nle-c[Asp-Oic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 242);
Ac-Nle-c[Asp-Tic-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 244); and
Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 255),
wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond.

62. The method or the use of any one of claims 1-48 and 57, wherein R^5 is absent or selected from the group consisting of Lys, Orn, His, Ala, *trans*Pro(guan), *cis*Pro(guan), and Glu.

63. The method or the use of any one of claims 1-48, 57, and 62, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-Pro-dNal(2')-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 86);
Ac-Nle-c[Asp-Pro-dNal(2')-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 87);
Ac-Nle-c[Asp-Pro-dNal(2')-Orn-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 90);

Ac-Nle-c[Asp-Pro-dNal(2')-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 92);
Ac-Nle-c[Asp-Pro-dNal(2')-Ala-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 93);
Ac-Nle-c[Asp-Pro-dNal(2')-Glu-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 96);
Ac-Nle-c[Asp-His-dNal(2')-*trans*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 247);
Ac-Nle-c[Asp-His-dNal(2')-*cis*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 248);
Ac-Nle-c[Asp-Pro-dNal(2')-*trans*Pro(guan)-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 250); and
Ac-Nle-c[Asp-Pro-dNal(2')-*cis*Pro(guan)Pro-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 251),
wherein c represents cyclization through R^2 and R^7 via a lactam bond.

64. The method or the use of any one of claims 1-48 and 57, wherein R^6 is selected from the group consisting of Nal(1'), dNal(1'), Aia, Phe, dPhe, Tyr, dTyr, dNal(2'), dTrp, Aba, and Ata.

65. The method or the use of any one of claims 1-48, 57, and 64, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Nal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 102);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aia-Lys]-dVal-dPro-NH2 (SEQ ID NO: 103);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Phe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 104);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Tyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 105);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(1')-Lys]-dVal-dPro-NH2 (SEQ ID NO: 108);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dPhe-Lys]-dVal-dPro-NH2 (SEQ ID NO: 109);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dNal(2']-Lys]-dVal-dPro-NH2 (SEQ ID NO: 110);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTyr-Lys]-dVal-dPro-NH2 (SEQ ID NO: 111);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-dTrp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 196);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 253); and
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 254),
wherein c represents cyclization through R^2 and R^7 via a lactam bond.

66. The method or the use of any one of claims 1-48 and 57, wherein:

(i) Y^1 is selected from dPro, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, Lys, dLys, Trp, and dTle and Y^2 is absent or selected from dVal, Val, Hyp, dHyp, Pro, Ala, dAla, Gly, Asp, Arg, Asn, dAsp, dArg, dAsn, and dTle; or

(ii) Y^1 is dVal, Y^2 is dPro, and the C-terminus of the non-naturally occurring melanocortin analog is not modified.

67. The method or the use of any one of claims 1-48, 57, and 66, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Pro-NH_2 (SEQ ID NO: 115);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-OH (SEQ ID NO: 116);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-OH (SEQ ID NO: 117);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Hyp-NH_2 (SEQ ID NO: 118);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dHyp-NH_2 (SEQ ID NO: 119);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-Hyp-NH_2 (SEQ ID NO: 120);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-dHyp-NH_2 (SEQ ID NO: 121);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-dVal-NH_2 (SEQ ID NO: 122);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-dVal-NH_2 (SEQ ID NO: 123);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-Val-NH_2 (SEQ ID NO: 124);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-Val-NH_2 (SEQ ID NO: 125);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-NH_2 (SEQ ID NO: 126);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-NH_2 (SEQ ID NO: 127);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-NH_2 (SEQ ID NO: 128);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-NH_2 (SEQ ID NO: 129);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Val-NH_2 (SEQ ID NO: 130);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Pro-NH_2 (SEQ ID NO: 131);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-NH_2 (SEQ ID NO: 132);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-NH_2 (SEQ ID NO: 133);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dHyp-NH_2 (SEQ ID NO: 134);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Hyp-NH_2 (SEQ ID NO: 135);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAla-dAla-NH_2 (SEQ ID NO: 136);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Ala-Ala-NH_2 (SEQ ID NO: 137);

Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Gly-Gly-NH_2 (SEQ ID NO: 138);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asp-NH_2 (SEQ ID NO: 139);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Arg-NH_2 (SEQ ID NO: 140);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-Asn-NH_2 (SEQ ID NO: 141);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsp-NH_2 (SEQ ID NO: 142);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dArg-NH_2 (SEQ ID NO: 143);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dAsn-NH_2 (SEQ ID NO: 144);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-dPro-NH_2 (SEQ ID NO: 145);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-NH_2 (SEQ ID NO: 146);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-dPro-NH_2 (SEQ ID NO: 147);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-dPro-NH_2 (SEQ ID NO: 148);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-NH_2 (SEQ ID NO: 149);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-dPro-NH_2 (SEQ ID NO: 150);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asp-NH_2 (SEQ ID NO: 151);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-NH_2 (SEQ ID NO: 152);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Asn-NH_2 (SEQ ID NO: 153);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsp-NH_2 (SEQ ID NO: 154);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-NH_2 (SEQ ID NO: 155);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dAsn-NH_2 (SEQ ID NO: 156);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Pro-Val-NH_2 (SEQ ID NO: 157);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-dVal-NH_2 (SEQ ID NO: 158);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-dVal-NH_2 (SEQ ID NO: 159);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dPro-NH_2 (SEQ ID NO: 160);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dPro-NH_2 (SEQ ID NO: 161);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-Val-Pro-NH_2 (SEQ ID NO: 162);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Lys-dVal-dPro-NH_2 (SEQ ID NO: 163);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 164);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Pro-Val-NH_2 (SEQ ID NO: 165);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dPro-dVal-NH_2 (SEQ ID NO: 166);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dPro-dVal-NH_2 (SEQ ID NO: 167);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-Val-Pro-NH_2 (SEQ ID NO: 168);

Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Arg-dVal-dPro-NH_2 (SEQ ID NO: 169);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 170);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-dPro-NH_2 (SEQ ID NO: 171);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 172);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dVal-NH_2 (SEQ ID NO: 173);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-NH_2 (SEQ ID NO: 174);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dPro-NH_2 (SEQ ID NO: 175);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 176);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dTle-NH_2 (SEQ ID NO: 177);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dTle-NH_2 (SEQ ID NO: 178);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-Trp-NH_2 (SEQ ID NO: 203); and
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 263),
wherein c represents cyclization through R^2 and R^7 via a lactam bond.

68. The method or the use of any one of claims 1-48 and 57, wherein one or more of Y^3-Y^7 are present and are each independently dVal or dPro.

69. The method or the use of any one of claims 1-48, 57, and 68, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dPro-NH_2 (SEQ ID NO: 179);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 180);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 181);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-dVal-dPro-NH_2 (SEQ ID NO: 182); and
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dVal-dVal-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 183),
wherein c represents cyclization through R^2 and R^7 via a lactam bond.

70. The method or the use of any one of claims 1-48 and 57, wherein one or more of X^1-X^3 are present and are Nle.

71. The method or the use of any one of claims 1-48, 57, and 70, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 184);
Ac-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 185); and
Ac-Nle-Nle-Nle-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 186),
wherein c represents cyclization through R^2 and R^7 via a lactam bond.

72. The method or the use of any one of claims 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized through a lactam bond between (i) Asp at R^1 and Lys at R^7, (ii) Asp at R^2 and Lys at R^8, or (ii) Asp at R^1 and Lys at R^8.

73. The method or the use of any one of claims 1-48 and 72, wherein R^2 is selected from Asp, Trp, Pro, and Glu, R^3 is selected from Pro, Glu, and His, and R^7 is selected from Lys, Pro, and Gly.

74. The method or the use of any one of claims 1-48, 72, and 73, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-Pro-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 194);
Ac-Nle-c[Asp-Trp-Pro-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 195);
Ac-Nle-c[Asp-Pro-Glu-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 257);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Pro-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 245);
Ac-Nle-c[Asp-Glu-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 256);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 259);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 260);
Ac-Nle-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-dLys-dAsp-NH_2 (SEQ ID NO: 261);
Ac-Glu-c[Asp-Pro-dNal(2')-Arg-Trp-Gly-Lys]-dPro-dPro-Lys-Asp-NH_2 (SEQ ID NO: 262);
Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 264); and
Ac-Nle-c[Asp-Glu-His-dNal(2')-Arg-Trp-Gly-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 265),
wherein c represents cyclization through R^1 or R^2 and R^7 or R^8 via a lactam bond.

75. The method or the use of any one of claims 1-48, wherein one of R^2 and R^3 is Ala or dAla.

76. The method or the use of any one of claims 1-48, 72, and 75, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-Nle-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 266);
Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 267);
Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 269);
Ac-dArg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 270);
Ac-Arg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 271);
Ac-dArg-c[Asp-dAla-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 272);
Ac-Nle-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 273);
Ac-Arg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 274);
Ac-dArg-c[Asp-Ala-His-dNal(2')-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 275);
Ac-Arg-c[Cys-dAla-His-dNal(2')-Arg-Trp-Cys]-NH_2 (SEQ ID NO: 282); and
Ac-Arg-c[Asp-dAla-His-dNal(2')-Arg-Trp-Lys]-NH_2 (SEQ ID NO: 283),
wherein c represents cyclization through R^1 or R^2 and R^7 via a lactam bond or a disulfide bond.

77. The method or the use of any one of claims 1-48, wherein the non-naturally occurring melanocortin analog comprises a sequence cyclized through a disulfide bond between dPen at R^2 and dPen at R^7 or R^8.

78. The method or the use of any one of claims 1-48 and 77, wherein R^1 is selected from the group consisting of Nle, dLeu, dNle, dArg, Arg, dPhe, dTyr, Ala, dHis, His, dLys, and Lys.

79. The method or the use of any one of claims 1-48, 77, and 78, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:
Ac-dLeu-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 327);
Ac-dNle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 328);

Ac-dArg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 329);
Ac-Arg-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 330);
Ac-dPhe-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 331);
Ac-dTyr-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 332);
Ac-Ala-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 333);
Ac-dHis-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 334);
Ac-His-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 335);
Ac-dLys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 336);
Ac-Lys-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 337);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dVal-dPro-NH_2 (SEQ ID NO: 344);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dVal-dPro-NH_2 (SEQ ID NO: 345);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dArg-dPro-NH_2 (SEQ ID NO: 346);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dLys-dPro-NH_2 (SEQ ID NO: 347);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dVal-dHyp-NH_2 (SEQ ID NO: 348);
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-dPen]-dTle-dPro-NH_2 (SEQ ID NO: 349); and
Ac-Nle-c[dPen-Pro-dNal(2')-Arg-Trp-Gly-dPen]-dVal-dPro-NH_2 (SEQ ID NO: 350),
wherein c represents cyclization through R^1 or R^2 and R^7 or R^8 via a disulfide bond.

80. The method or the use of any one of claims 1-47, wherein the non-naturally occurring melanocortin analog is linear.

81. The method or the use of any one of claims 1-47 and 80, wherein the sequence of any one of Formulae (I)-(ID) is:

Ac-Nle-Asp-Pro-dNal(2')-Arg-Trp-Lys-dVal-dPro-NH_2 (SEQ ID NO: 13); or

Ac-Nle-Pro-dNal(2')-Arg-Trp-dVal-dPro-NH_2 (SEQ ID NO: 14).

82. The method or the use of any one of claims 1-46, wherein R^4 is selected from the group consisting of dPhe, p(Cl)dPhe p(I)dPhe, p(Br)dPhe, p(F)dPhe, or p(CF_3)dPhe.

83. The method or the use of any one of claims 1-46 and 82, wherein the sequence of any one of Formulae (I)-(ID) is selected from the group consisting of:

Ac-Nle-c[Asp-Pro-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 215);
Ac-Nle-c[Asp-Pro-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 216);
Ac-Nle-c[Asp-Pro-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 217);
Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 219);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 220);
Ac-Nle-c[Asp-His-p(I)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 221);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 222);
Ac-Nle-c[Asp-His-p(CF_3)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 224);
Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aia-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 236);
Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Aba-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 237);
Ac-Nle-c[Asp-Pro-p(CF_3)dPhe-Arg-Ata-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 238);
Ac-Nle-c[Asp-dBip-dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 369);
Ac-Nle-c[Asp-Pro-dPhe-Lys-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 426);
Ac-Nle-c[Asp-Pro-dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 430);
Ac-Nle-c[Asp-Pro-dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 431);
Ac-Nle-c[Cys-Pro-p(F)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 432);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 444);
Ac-Nle-c[Asp-Pro-p(F)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 445);
Ac-Nle-c[Asp-Phe-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 487);
Ac-Nle-c[Asp-Bip-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 489);
Ac-Nle-c[Asp-Trp-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 493);
Ac-Nle-c[Asp-Tyr-p(F)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 495);
Ac-Nle-c[Cys-His-p(Cl)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 497);
Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 500);
Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 507);
Ac-Nle-c[Asp-His-p(Cl)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 508);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 509);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 510);
Ac-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 514);
Ac-Nle-Nle-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 516);
Ac-Ala-c[Asp-His-p(Cl)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 517);

Ac-Nle-c[Asp-dHis-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 524);
Ac-Nle-c[Asp-Phe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 525);
Ac-Nle-c[Asp-dPhe-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 526);
Ac-Nle-c[Asp-Bip-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 527);
Ac-Nle-c[Asp-Gln-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 529);
Ac-Nle-c[Asp-Trp-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 531);
Ac-Nle-c[Asp-Tyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 533);
Ac-Nle-c[Asp-dTyr-p(Cl)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 534);
Ac-Nle-c[Cys-His-p(Br)dPhe-Arg-Trp-Cys]-dVal-dPro-NH_2 (SEQ ID NO: 535);
Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 538);
Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 539);
Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 540);
Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 541);
Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 542);
Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 543);
Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 544);
Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 545);
Ac-Nle-c[Asp-His-p(Br)dPhe-His-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 546);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-dNal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 547);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Nal(2')-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 548);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dTle-dVal-NH_2 (SEQ ID NO: 549);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dVal-dVal-dVal-dPro-NH_2 (SEQ ID NO: 550);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 551);
Ac-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 552);
Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 553);
Ac-Nle-Nle-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dPro-dVal-dPro-NH_2 (SEQ ID NO: 554);
Ac-Ala-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 555);
Ac-dArg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 556);
Ac-Arg-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 557);
Ac-Lys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 558);
Ac-dLys-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 559);

Ac-His-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 560);
Ac-dHis-c[Asp-His-p(Br)dPhe-Arg-Trp-Lys]-dTle-dPro-NH_2 (SEQ ID NO: 561);
Ac-Nle-c[Asp-dHis-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 562);
Ac-Nle-c[Asp-Phe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 563);
Ac-Nle-c[Asp-dPhe-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 564);
Ac-Nle-c[Asp-Bip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 565);
Ac-Nle-c[Asp-dBip-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 566);
Ac-Nle-c[Asp-Gln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 567);
Ac-Nle-c[Asp-dGln-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 568);
Ac-Nle-c[Asp-Trp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 569);
Ac-Nle-c[Asp-dTrp-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 570);
Ac-Nle-c[Asp-Tyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 571); and
Ac-Nle-c[Asp-dTyr-p(Br)dPhe-Arg-Trp-Lys]-dVal-dPro-NH_2 (SEQ ID NO: 572),
wherein c represents cyclization through R^2 and R^7 via a lactam bond or a disulfide bond.

84. The method or the use of any one of claims 1-83, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-12, 13-23, 24-27, 28-30, 31-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-122, 123-138, 139-157, 158-164, 165-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219-222, 224, 236-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350, 369, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-510, 514, 516-517, 524-527, 529, 531, 533-535, and 538-572.

85. The method or the use of claim 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-23, 24-27, 28-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-157, 158-162, 164-172, 173-182, 183-186, 194-197, 199-201, 203-206, 215-217, 219, 221-222, 224, 236-242, 244-245, 247-248, 250-257, 259-267, 269-275, 282-283, 327-337, 344-350, 509-510, 525-527, 531, 533-535, 538, 545-549, 551-553, 555, 562-569, 571-572.

86. The method or the use of claim 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-4, 13, 15-23, 24-32, 35-43, 48-55, 59, 64-69, 71-76, 77-82, 86-87, 90, 92-93, 96, 102, 104-105, 108-111, 115-138, 139-162, 164, 165-186, 195-197, 199-201, 203, 215-217, 219, 221-222, 224, 240-242, 244, 255-256, 259-267, 269-275, 327-328, 331, 344-350, 525-527, 531, 533-535, 538, 545, 547-549, 551-553, 555, 562-569, 571-572.

87. The method or the use of claim 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 2-7, 9-10, 12-43, 48-55, 59, 64-69, 71-76, 77-82, 84-87, 90, 92-93, 96, 102-105, 108-111, 115-138, 139-162, 164, 165-186, 194-197, 199-201, 203-206, 239-242, 244-245, 247-248, 250-251, 253-257, 259-267, 269-275, 282-283, 327-337, 344-350.

88. The method or the use of claim 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 215-217, 219-222, 224, 236-238, 497, 500, 507-510, 514, 516-517, 535, 538-561.

89. The method or the use of claim 84, wherein the non-naturally occurring melanocortin analog comprises any one of the sequences of SEQ ID NOs: 220, 426, 430-432, 444-445, 487, 489, 493, 495, 497, 500, 507-508, 514, 516-517, 524, 529, 539-544, 550, 554, 556-561.

90. The method or the use of claim 89, wherein the non-naturally occurring melanocortin analog comprises a sequence of SEQ ID NO: 3.

91. The method or the use of any one of claims 1-90, wherein the non-naturally occurring melanocortin analog is present in a pharmaceutical composition.

92. The method or the use of claim 91, wherein the pharmaceutical composition comprises one or more pharmaceutically acceptable excipients and/or carriers.

93. The method or the use of claim 92, wherein the one or more pharmaceutically acceptable excipients and/or carriers of the pharmaceutical composition comprise water.

94. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg to about 20 mg/kg administered once a day for about 5 days to about 10 days; (ii) at a second dose of about 10 mg/kg to about 40 mg/kg administered once a day after administration of the first dose for about 5 days to about 10 days; (iii) at a third dose of about 5 mg/kg to about 30 mg/kg administered twice a day after administration of the second dose for at least about 5 days to about 10 days.

95. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 5 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 15 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 10 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

96. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 10 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 20 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 15 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

97. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered (i) at a first dose of about 15 mg/kg administered once a day for about 7 days; (ii) at a second dose of about 25 mg/kg administered once a day after administration of the first dose for about 7 days; (iii) at a third dose of about 20 mg/kg administered twice a day after administration of the second dose for at least about 7 days.

98. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.5 mg/kg to about 10 mg/kg per body weight of the subject once daily.

99. The method or the use of claim 98, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 1 mg/kg or 3 mg/kg per body weight of the subject once daily.

100. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 0.1 mg to about 100 mg once daily.

101. The method or the use of any one of claims 1-93, wherein the non-naturally occurring melanocortin analog is administered at a dose of about 10 mg or about 50 mg once daily.

102. The method or the use of any one of claims 1-101, wherein the non-naturally occurring melanocortin analog is administered via intraperitoneal, intravenous, parenteral, subcutaneous, intramuscular, intracerebroventricular, intranasal, or oral administration.

103. The method or the use of any one of claims 1-102, wherein the non-naturally occurring melanocortin analog crosses a blood-brain-barrier of a subject.

104. The method or the use of any one of claims 101 or 102, wherein the non-naturally occurring melanocortin analog comprises a sequence of SEQ ID NO: 3 and is administered at least once daily in an amount ranging from 0.001 mg/kg to 25 mg/kg per body weight of the subject.

105. The method or the use of claim 104, wherein the non-naturally occurring melanocortin analog comprises a sequence of SEQ ID NOs: 3 and is administered at least once daily in an amount ranging from 0.5 mg/kg to 10 mg/kg per body weight of the subject.

106. The method or the use of any one of claims 1-105, wherein the non-naturally occurring melanocortin analog is administered to a subject for at least 1 day, 1 week, 1 month, 3 months, 6 months, 1 year, or 5 years.

107. The method or the use of any one of claims 1-105, wherein the non-naturally occurring melanocortin analog is administered to a subject for 1 day, 5 days, 7 days, 14 days, 21 days, 28 days, 35 days, 40 days, 45 days, 50 days, 60 days, 75 days, 90 days, 100 days, 110 days, or 120 days.

108. The method or the use of any one of claims 1-107, wherein the method or the use further comprises maintaining muscle mass or promoting muscle mass gain in the subject.