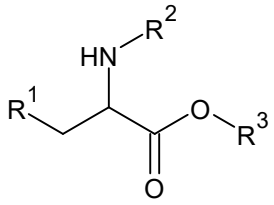
CLAIMS

1. A biotherapeutic formulation comprising a performance-enhancing excipient comprising a compound having the following chemical structure:



wherein,

R^1 = OH-, $OCOCH_3$, $OCOC_2H_5$, $OCOC_3H_7$, $OCOC_4H_9$, $OCOC_5H_{11}$, $OCOC_6H_{13}$, $CH_3CONHCH_2CH_2CH_2$, $C_2H_5CONHCH_2CH_2CH_2$, $C_3H_7CONHCH_2CH_2CH_2$, $C_4H_9CONHCH_2CH_2CH_2$, $C_5H_{11}CONHCH_2CH_2CH_2$, $C_6H_{13}CONHCH_2CH_2CH_2$, SH, $SCOCH_3$, $SCOC_2H_5$, $SCOC_3H_7$, $SCOC_4H_9$, $SCOC_5H_{11}$, $SCOC_6H_{13}$, Indolyl, Indolyl($NCOCH_3$), Indolyl($NCOC_2H_5$), Indolyl($NCOC_3H_7$), Indolyl($NCOC_4H_9$), Indolyl($NCOC_5H_{11}$), Indolyl($NCOC_6H_{13}$), PhOH, $PhOCOCH_3$, $PhOCOC_2H_5$, $PhOCOC_3H_7$, $PhOCOC_4H_9$, $PhOCOC_5H_{11}$, $PhOCOC_6H_{13}$, $CONH_2$, $CONHCH_3$, $CONHC_2H_5$, $CONHC_3H_7$, $CONHC_4H_9$, $CONH_2C_5H_{11}$, $CONH_2C_6H_{13}$, CH_2CONH_2, $CH_2CONHCH_3$, $CH_2CONHC_2H_5$, $CH_2CONHC_3H_7$, $CH_2CONHC_4H_9$, $CH_2CONHC_5H_{11}$, $CH_2CONHC_6H_{13}$, $CH_2CH_2NHC(NH)NH_2$, $CH_2CH_2NHC(NH)NHC(O)CH_3$, $CH_2CH_2NHC(NH)NHC(O)C_2H_5$, $CH_2CH_2NHC(NH)NHC(O)C_3H_7$, $CH_2CH_2NHC(NH)NHC(O)C_4H_9$, $CH_2CH_2NHC(NH)NHC(O)C_5H_{11}$, $CH_2CH_2NHC(NH)NHC(O)C_6H_{13}$, Imidazolyl, Imidazolyl($NCOCH_3$), Imidazolyl($NCOC_2H_5$), Imidazolyl($NCOC_3H_7$), Imidazolyl($NCOC_4H_9$), Imidazolyl($NCOC_5H_{11}$), Imidazolyl($NCOC_6H_{13}$), C(O)OH, $C(O)OCH_3$, $C(O)OC_2H_5$, $C(O)OC_3H_7$, $C(O)OC_4H_8$, $C(O)OC_5H_{11}$, $C(O)OC_6H_{13}$, $CH_2C(O)OH$, $CH_2C(O)OCH_3$, $CH_2C(O)OC_2H_5$, $CH_2C(O)OC_3H_7$, $CH_2C(O)OC_4H_8$, $CH_2C(O)OC_5H_{11}$, $CH_2C(O)OC_6H_{13}$,

R^2 = H, $C(O)CH_3$, $C(O)C_2H_5$, $C(O)C_3H_7$, $C(O)C_4H_9$, $C(O)C_5H_{11}$, $C(O)C_6H_{13}$

R^3= H, CH_3, C_2H_5, C_3H_7, C_4H_9, C_5H_{11}, C_6H_{13},

wherein the excipient reduces the viscosity of a high concentration biologic formulation, wherein the biologic formulation is selected from the group consisting of a protein therapeutic, a peptide, an antibody, an antibody drug conjugate and a nucleic acid and wherein the compound is selected from the group consisting of bis acetyl arginine, bis acetyl lysine, bis acetyl histidine, bis

acetyl serine, bis acetyl proline, bis acetyl tryptophan, propionyl arginine, propionyl lysine, propionyl histidine, propionyl serine, propionyl proline and propionyl tryptophan.

2. The biotherapeutic formulation of claim 1 wherein the compound is bis acetyl arginine.

3. The biotherapeutic formulation of claim 1 wherein the compound is bis acetyl lysine.

4. The biotherapeutic formulation of claim 1 wherein the compound is bis acetyl histidine.

5. The biotherapeutic formulation of claim 1 wherein the compound is bis acetyl serine.

6. The biotherapeutic formulation of claim 1 wherein the compound is bis acetyl proline.

7. The biotherapeutic formulation of claim 1 wherein the compound is bis acetyl tryptophan.

8. The biotherapeutic formulation of claim 1 wherein the compound is propionyl arginine.

9. The biotherapeutic formulation of claim 1 wherein the compound is propionyl lysine.

10. The biotherapeutic formulation of claim 1 wherein the compound is propionyl histidine.

11. The biotherapeutic formulation of claim 1 wherein the compound is propionyl serine.

12. The biotherapeutic formulation of claim 1 wherein the compound is propionyl proline.

13. The biotherapeutic formulation of claim 1 wherein the compound is propionyl tryptophan.

14. A method for reducing viscosity and/or increasing stability of a biologic formulation comprising:

combining the biotherapeutic formulation with a performance-enhancing excipient as defined in claim 1, and mixtures thereof,

wherein the biotherapeutic formulation comprises a therapeutic protein at a concentration of 1 mg/ml to 500 mg/ml, and a performance-enhancing excipient at a concentration of 5mM to 1000mM, to provide an enhanced formulation.

15. The method of claim 14 wherein the performance-enhancing excipient is a combination of two excipients present in the biologic formulation at 10wt.% : 90wt.% to 90wt.% : 10wt.%.

16. The method of claim 14 wherein the performance-enhancing excipient is a mixture of propionyl serine and bis acetyl lysine in the ratio of 10wt.% : 90wt.% to 90wt.% : 10wt.%.

17. The method of claim 14 wherein the enhanced formulation is in the form of a lyophilized powder, wherein at least one performance-enhancing excipient is present at a weight : weight concentration effective to reduce viscosity upon reconstitution with a diluent.

18. The method of claim 14 wherein the biotherapeutic formulation is selected from the group consisting of protein therapeutics, peptides, antibodies, antibody drug conjugates (ADC), nucleic acids, gene therapy and cell therapy.

19. The method of claim 14 wherein the enhanced formulation further comprises an additional excipient, wherein the additional excipient is selected from the group consisting of sugars, polyols, amino acids, surfactants, carbohydrates or combinations thereof.

20. The method of Claim 14, wherein the formulation further comprises a salt, a surfactant, a buffering agent, an antioxidant, an antimicrobial agent, a human serum albumin, a lipid and/or cyclodextrin.