<110> KOLON LIFE SCIENCE, INC.

<120> Composition for treating pain

<130> OPP20162511KR

<160> 25

<170> KopatentIn 2.0

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<211> 585
<212> PRT
<213> Homo sapiens

<400> 1

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35 40 45

Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro
50 55 60

Arg Ala Ala Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys
65 70 75 80

Ser Cys Ser Lys Val Asp Val Asn Tyr Ala Phe Leu His Ala Thr Asp
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Leu Leu Pro Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln
100 105 110

Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg
115 120 125

Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu
130 135 140

Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu
145 150 155 160

Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro
165 170 175

Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala
180 185 190

Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu
195 200 205

Ile Ala Pro Val Phe Val Leu Leu Glu Tyr Val Thr Leu Lys Lys Met
210 215 220

Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser
225 230 235 240

Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe
245 250 255

Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg
260 265 270

Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly
275 280 285

Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys
290 295 300

Asp Glu Arg Gly Lys Met Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu
305 310 315 320

Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala
325 330 335

Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp
340 345 350

Ile Cys Lys Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala Trp Gly
355 360 365

Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly Val
370 375 380

Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val
385 390 395 400

Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln
405 410 415

Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His
420 425 430

Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg
435 440 445

His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr
450 455 460

Thr Gly Phe Glu Ala His Val Asp Lys Cys Leu Glu Leu Ala Glu Tyr

465 470 475 480

Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp
485 490 495

Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser
500 505 510

Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys
515 520 525

Val Ala Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met
530 535 540

Val Ser Tyr Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val
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Glu Ile Glu Arg Leu Gly Gln Asp Leu
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<212> DNA
<213> Homo sapiens

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tctc 2824

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<212> DNA
<213> Artificial Sequence

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tcatgcagca aggtagatgt caactacgcg tttctccatg ccacagatct gctgccggct 300

tgcgacggtg aaaggcccac tttggccttt ctgcaggatg ttatgaacat tctgctgcag 360

tacgtggtga aaagtttcga ccggtcaacc aaagtgatcg actttcacta tcctaatgaa 420

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<211> 594
<212> PRT
<213> Homo sapiens

<400> 4
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Cys Gly Val Ala His Gly Cys Thr Arg Lys Leu Gly Leu Lys Ile Cys
35 40 45

Gly Phe Leu Gln Arg Thr Asn Ser Leu Glu Glu Lys Ser Arg Leu Val
50 55 60

Ser Ala Phe Lys Glu Arg Gln Ser Ser Lys Asn Leu Leu Ser Cys Glu
65 70 75 80

Asn Ser Asp Arg Asp Ala Arg Phe Arg Arg Thr Glu Thr Asp Phe Ser
85 90 95

Asn Leu Phe Ala Arg Asp Leu Leu Pro Ala Lys Asn Gly Glu Glu Gln
100 105 110

Thr Val Gln Phe Leu Leu Glu Val Val Asp Ile Leu Leu Asn Tyr Val
115 120 125

Arg Lys Thr Phe Asp Arg Ser Thr Lys Val Leu Asp Phe His His Pro
130 135 140

His Gln Leu Leu Glu Gly Met Glu Gly Phe Asn Leu Glu Leu Ser Asp
145 150 155 160

His Pro Glu Ser Leu Glu Gln Ile Leu Val Asp Cys Arg Asp Thr Leu
165 170 175

Lys Tyr Gly Val Arg Thr Gly His Pro Arg Phe Phe Asn Gln Leu Ser
180 185 190

Thr Gly Leu Asp Ile Ile Gly Leu Ala Gly Glu Trp Leu Thr Ser Thr
195 200 205

Ala Asn Thr Asn Met Phe Thr Tyr Glu Ile Ala Pro Val Phe Val Leu
210 215 220

Met Glu Gln Ile Thr Leu Lys Lys Met Arg Glu Ile Val Gly Trp Ser
225 230 235 240

Ser Lys Asp Gly Asp Gly Ile Phe Ser Pro Gly Gly Ala Ile Ser Asn
245 250 255

Met Tyr Ser Ile Met Ala Ala Arg Tyr Lys Tyr Phe Pro Glu Val Lys
260 265 270

Thr Lys Gly Met Ala Ala Val Pro Lys Leu Val Leu Phe Thr Ser Glu
275 280 285

Gln Ser His Tyr Ser Ile Lys Lys Ala Gly Ala Ala Leu Gly Phe Gly
290 295 300

Thr Asp Asn Val Ile Leu Ile Lys Cys Asn Glu Arg Gly Lys Ile Ile
305 310 315 320

Pro Ala Asp Phe Glu Ala Lys Ile Leu Glu Ala Lys Gln Lys Gly Tyr
325 330 335

Val Pro Phe Tyr Val Asn Ala Thr Ala Gly Thr Thr Val Tyr Gly Ala
340 345 350

Phe Asp Pro Ile Gln Glu Ile Ala Asp Ile Cys Glu Lys Tyr Asn Leu
355 360 365

Trp Leu His Val Asp Ala Ala Trp Gly Gly Gly Leu Leu Met Ser Arg
370 375 380

Lys His Arg His Lys Leu Asn Gly Ile Glu Arg Ala Asn Ser Val Thr
385 390 395 400

Trp Asn Pro His Lys Met Met Gly Val Leu Leu Gln Cys Ser Ala Ile
405 410 415

Leu Val Lys Glu Lys Gly Ile Leu Gln Gly Cys Asn Gln Met Cys Ala
420 425 430

Gly Tyr Leu Phe Gln Pro Asp Lys Gln Tyr Asp Val Ser Tyr Asp Thr
435 440 445

Gly Asp Lys Ala Ile Gln Cys Gly Arg His Val Asp Ile Phe Lys Phe
450 455 460

Trp Leu Met Trp Lys Ala Lys Gly Thr Val Gly Phe Glu Asn Gln Ile
465 470 475 480

Asn Lys Cys Leu Glu Leu Ala Glu Tyr Leu Tyr Ala Lys Ile Lys Asn
485 490 495

Arg Glu Glu Phe Glu Met Val Phe Asn Gly Glu Pro Glu His Thr Asn
500 505 510

Val Cys Phe Trp Tyr Ile Pro Gln Ser Leu Arg Gly Val Pro Asp Ser
515 520 525

Pro Gln Arg Arg Glu Lys Leu His Lys Val Ala Pro Lys Ile Lys Ala
530 535 540

Leu Met Met Glu Ser Gly Thr Thr Met Val Gly Tyr Gln Pro Gln Gly
545 550 555 560

Asp Lys Ala Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr
565 570 575

Gln Ser Asp Ile Asp Phe Leu Ile Glu Glu Ile Glu Arg Leu Gly Gln
580 585 590

Asp Leu

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<211> 1784
<212> DNA
<213> Homo sapiens

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gaaaactggg gctcaagatc tgcggcttct tgcaaaggac caacagcctg gaagagaaga 180

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cagctgattt tgaggcaaaa attcttgaag ccaaacagaa gggatatgtt ccctttatg 1020

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acttcctcat tgaggagata gaaagactgg gccaggatct gtaa 1784

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<211> 178
<212> PRT
<213> Rattus norvegicus

<400> 6

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Lys Thr Ser Lys Gly His Ser Ile Arg Gly Asp Asn Asn Cys Thr His
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Phe Pro Val Ser Gln Thr His Met Leu Arg Glu Leu Arg Ala Ala Phe
35 40 45

Ser Gln Val Lys Thr Phe Phe Gln Lys Lys Asp Gln Leu Asp Asn Ile
50 55 60

Leu Leu Thr Asp Ser Leu Leu Gln Asp Phe Lys Gly Tyr Leu Gly Cys
65 70 75 80

Gln Ala Leu Ser Glu Met Ile Lys Phe Tyr Leu Val Glu Val Met Pro
85 90 95

Gln Ala Glu Asn His Gly Pro Glu Ile Lys Glu His Leu Asn Ser Leu
100 105 110

Gly Glu Lys Leu Lys Thr Leu Trp Ile Gln Leu Arg Arg Cys His Arg
115 120 125

Phe Leu Pro Cys Glu Asn Lys Ser Lys Ala Val Glu Gln Val Lys Asn
130 135 140

Asp Phe Asn Lys Leu Gln Asp Lys Gly Val Tyr Lys Ala Met Asn Glu
145 150 155 160

Phe Asp Ile Phe Ile Asn Cys Ile Glu Ala Tyr Val Thr Leu Lys Met
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Lys Asn

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<212> DNA
<213> Rattus norvegicus

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<211> 537
<212> DNA
<213> Artificial Sequence

<220>
<223> Optimized rat IL-10

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ttcgacatct ttatcaactg catagaagct tacgttacac tcaagatgaa gaattga 537

<210> 9
<211> 178
<212> PRT
<213> Homo sapiens

<400> 9
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Phe Pro Gly Asn Leu Pro Asn Met Leu Arg Asp Leu Arg Asp Ala Phe
35 40 45

Ser Arg Val Lys Thr Phe Phe Gln Met Lys Asp Gln Leu Asp Asn Leu
50 55 60

Leu Leu Lys Glu Ser Leu Leu Glu Asp Phe Lys Gly Tyr Leu Gly Cys
65 70 75 80

Gln Ala Leu Ser Glu Met Ile Gln Phe Tyr Leu Glu Glu Val Met Pro
85 90 95

Gln Ala Glu Asn Gln Asp Pro Asp Ile Lys Ala His Val Asn Ser Leu
100 105 110

Gly Glu Asn Leu Lys Thr Leu Arg Leu Arg Leu Arg Arg Cys His Arg
115 120 125

Phe Leu Pro Cys Glu Asn Lys Ser Lys Ala Val Glu Gln Val Lys Asn

130 135 140

Ala Phe Asn Lys Leu Gln Glu Lys Gly Ile Tyr Lys Ala Met Ser Glu
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Phe Asp Ile Phe Ile Asn Tyr Ile Glu Ala Tyr Met Thr Met Lys Ile
165 170 175

Arg Asn

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<211> 1600
<212> DNA
<213> Homo sapiens

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acccacttcc caggcaacct gcctaacatg cttcgagatc tccgagatgc cttcagcaga 180

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tggtatttga gtgttttaag ataaattata agttacataa gggaggaaaa aaaatgttct 900

ttggggagcc aacagaagct tccattccaa gcctgaccac gctttctagc tgttgagctg 960

ttttccctga cctccctcta atttatcttg tctctgggct tggggcttcc taactgctac 1020

aaatactctt aggaagagaa accagggagc ccctttgatg attaattcac cttccagtgt 1080

ctcggaggga ttcccctaac ctcattcccc aaccacttca ttcttgaaag ctgtggccag 1140

cttgttattt ataacaacct aaatttggtt ctaggccggg cgcggtggct cacgcctgta 1200

atcccagcac tttgggaggc tgaggcgggt ggatcacttg aggtcaggag ttcctaacca 1260

gcctggtcaa catggtgaaa ccccgtctct actaaaaata caaaaattag ccgggcatgg 1320

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aggagatgga agttgcagtg agctgatatc atgcccctgt actccagcct gggtgacaga 1440

gcaagactct gtctcaaaaa ataaaaataa aaataaattt ggttctaata gaactcagtt 1500

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gattttaatt ttgaataaat aaatgtatct tattcacatc 1600

<210> 11
<211> 147
<212> PRT
<213> Rattus norvegicus

<400> 11

Met Gly Leu Ser Pro His Leu Ala Val Thr Leu Phe Cys Phe Leu Ile
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Cys Thr Gly Asn Gly Ile His Gly Cys Asn Asp Ser Pro Leu Arg Glu
20 25 30

Ile Ile Asn Thr Leu Asn Gln Val Thr Glu Lys Gly Thr Pro Cys Thr
35 40 45

Glu Met Phe Val Pro Asp Val Leu Thr Ala Thr Arg Asn Thr Thr Glu
50 55 60

Asn Glu Leu Ile Cys Arg Ala Ser Arg Val Leu Arg Lys Phe Tyr Phe
65 70 75 80

Pro Arg Asp Val Pro Pro Cys Leu Lys Asn Lys Ser Gly Val Leu Gly
85 90 95

Glu Leu Arg Lys Leu Cys Arg Gly Val Ser Gly Leu Asn Ser Leu Arg
100 105 110

Ser Cys Thr Val Asn Glu Ser Thr Leu Thr Thr Leu Lys Asp Phe Leu
115 120 125

Glu Ser Leu Lys Ser Ile Leu Arg Gly Lys Tyr Leu Gln Ser Cys Thr
130 135 140

Ser Met Ser
145

<210> 12
<211> 475
<212> DNA
<213> Rattus norvegicus

<400> 12
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agagagatca tcaacacttt gaaccaggtc acagaaaaag ggactccatg caccgagatg 180

tttgtaccag acgtccttac ggcaacaagg aacaccacgg agaacgagct catctgcagg 240

gcttccaggg tgcttcgcaa attttacttc ccacgtgatg tacctccgtg cttgaagaac 300

aagtctgggg ttctcggtga actgaggaaa ctctgtagag gtgtcagcgg tctgaactca 360

ctgagaagct gcaccgtgaa tgagtccacg ctcacaacac tgaaagactt cctggaaagc 420

ctaaaaagca tcctacgagg gaaatacttg cagtcctgca cttccatgtc ctaac 475

<210> 13
<211> 444
<212> DNA
<213> Artificial Sequence

<220>
<223> Optimized rat IL-4

<400> 13
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ggaattcatg gctgtaacga cagccctctg agagagatta tcaacacctt gaatcaggtt 120

accgaaaaag gcactccatg caccgagatg tttgtaccag atgtgcttac ggcaacgagg 180

aacaccactg agaatgagct gatctgtcgg gcttctcgag tgctgcgcaa attctacttc 240

cctcgtgatg tgcccccgtg cttgaagaac aagtcaggcg tgctcggaga actgaggaag 300

ctctgcagag gcgtctcagg gctgaattct ctgcgcagct gcaccgtgaa tgaatccaca 360

ctcacaaccc tgaaagactt cctggagagc ctgaagagca tcctacgggg gaagtatctc 420

cagtcctgca cttccatgag ttga 444

<210> 14
<211> 153
<212> PRT
<213> Homo sapiens

<400> 14
Met Gly Leu Thr Ser Gln Leu Leu Pro Pro Leu Phe Phe Leu Leu Ala
1 5 10 15

Cys Ala Gly Asn Phe Val His Gly His Lys Cys Asp Ile Thr Leu Gln
20 25 30

Glu Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu Gln Lys Thr Leu Cys
35 40 45

Thr Glu Leu Thr Val Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr Thr
50 55 60

Glu Lys Glu Thr Phe Cys Arg Ala Ala Thr Val Leu Arg Gln Phe Tyr
65 70 75 80

Ser His His Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr Ala Gln Gln
85 90 95

Phe His Arg His Lys Gln Leu Ile Arg Phe Leu Lys Arg Leu Asp Arg
100 105 110

Asn Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys Pro Val Lys Glu Ala
115 120 125

Asn Gln Ser Thr Leu Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile Met
130 135 140

Arg Glu Lys Tyr Ser Lys Cys Ser Ser
145 150

<210> 15
<211> 642
<212> DNA
<213> Homo sapiens

<400> 15
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gcaactttgt ccacggacac aagtgcgata tcaccttaca ggagatcatc aaaactttga 180

acagcctcac agagcagaag actctgtgca ccgagttgac cgtaacagac atctttgctg 240

cctccaagaa cacaactgag aaggaaacct tctgcagggc tgcgactgtg ctccggcagt 300

tctacagcca ccatgagaag gacactcgct gcctgggtgc gactgcacag cagttccaca 360

ggcacaagca gctgatccga ttcctgaaac ggctcgacag gaacctctgg ggcctggcgg 420

gcttgaattc ctgtcctgtg aaggaagcca accagagtac gttggaaaac ttcttggaaa 480

ggctaaagac gatcatgaga gagaaatatt caaagtgttc gagctgaata ttttaattta 540

tgagtttttg atagctttat tttttaagta tttatatatt tataactcat cataaaataa 600

agtatatata gaatctaaaa aaaaaaaaaa aaaaaaaaaa aa 642

<210> 16
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward primer for amplifying CMV promoter

<400> 16
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<210> 17
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse primer for amplifying CMV promoter

<400> 17
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<210> 18
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward primer for amplifying SV40pA

<400> 18
ccatcgatca gacatgataa gatacattga tgag 34

<210> 19
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse primer for amplifying SV40pA

<400> 19
gacgtcgacg cggccgctac cacatttgta gaggttttac ttg 43

<210> 20
<211> 28
<212> DNA
<213> Artificial Sequence

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<223> Forward primer for amplifying Kanamycin resistant gene

<400> 20
aggcgccatgagccatattcaacgggaa 28

<210> 21
<211> 29
<212> DNA
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<223> Reverse primer for amplifying Kanamycin resistant gene

<400> 21
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<210> 22
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward primer for amplifying LITR and CMV

<400> 22
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<210> 23
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse primer for amplifying SV40pA and RITR

<400> 23
atggatccgc tagtaaatac cgcatcag 28

<210> 24
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward primer for amplifying rIL-10

<400> 24
ccgctagcgc caccatgcct 20

<210> 25
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Reverse primer for amplifying rIL-10

<400> 25
gacgtcgacg ccatcgatgg cttaattaat caattcttc 39