

# SEQUENCE LISTING

<110> Regeneron Pharmaceuticals, Inc.

<120> Piezo Type Mechanosensitive Ion Channel Component 1 (PIEZ01)  
Variants And Uses Thereof

<130> 189238.02502 (3172)

<150> 62/862,847

<151> 2019-06-18

<150> 62/806,932

<151> 2019-02-18

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<170> PatentIn version 3.5

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| ggagttgtac gccaagctca tcttcctcta ccgtcaccg gagaccatga tcaagtggac   | 69600 |
| tcgtgagaag gagtaggagc tgctgctggc gcccagagagg gaaggagccg gcctgctggg | 69660 |
| cagcgtggcc acaaggggcg gcaactctca ggccggggga gccactgccc cgtccaaggc  | 69720 |
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| ggagaaggag gaagaggaga aggcggcgcg cggguccccg cgggucagcc auggcgcgcc     | 180  |
| ggccccgggg ccccccgcacc gcccacauagc gccgcggcgcu ccgcucgguc uggggccgggc | 240  |
| ccuggggcccu ccagccaugg agccgcacgu gcucggcgcg guccuguacu ggcugcugcu    | 300  |
| gcccugcgcg cugcuggcug ccugccugcu ccgcuucagc ggacucucgc uggucuaccu     | 360  |
| gcucuuccug cugcugcugc ccugguuccc cggccccacc cgaugcggcc uccaagguca     | 420  |
| cacaggccgc cuccugcggg cauugcuggg ccucagccug cucuuccugg uggccccaucu    | 480  |
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| cagccgcugg gagaccucu cgcgacacau aggggucaca aggcuggacc ugaaggacau      | 600  |
| ccccaacgcc auccggcugg uggccccuga ccugggcauc uugguggucu ccucugucug     | 660  |
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| ggaugaugau gagagggaug uggauccag cccgacggca gggcugcagg aagcagcaac      | 780  |
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| cugccacuuu cccaucagca cucggggcuu cagcagacuc ugcgucgcgg uggggugcuu     | 1020 |
| cggcgccggc caucucaucu gccucuacug cuaccagaug cccuuggcac aggcucugcu     | 1080 |
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| ccccggcguc  | cuccugcugc | ugugcuacgc  | cacggccucu  | cugcgcaagc  | uccgcgcgua  | 1260 |
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| agcagagcug  | gaccaguggc | cccaggaacg  | ggagucugac  | cagcacuggg  | ugcccacagc  | 1380 |
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| cauacccuac  | cacagcuggc | ugaccuucgu  | acugcugcuc  | ugggccugcc  | ucaucuggac  | 1620 |
| ggugcgCagc  | cgccaccaac | uggccaugcu  | gugcucgccc  | ugcauccugc  | uguauGGgGau | 1680 |
| gacgcugugc  | ugccuacgcu | acgugugggc  | cauggaccug  | cgcccugagc  | ugcccaccac  | 1740 |
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| guacgccaag  | uacuggaucu | augugugugc  | uggcauguuc  | aucgugguca  | gcuucgccgg  | 2040 |
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|             |             |            |            |            |             |      |
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| cugccugucc  | accgugugga  | ccugcgucan | caucgugugu | aagaugcugu | accagcucaa  | 2880 |
| gguuugucaac | ccccaggagu  | auuccagcaa | cugcaccgag | cccuucccca | acagcaccaa  | 2940 |
| cuugcugccc  | acggagauca  | gccagucccu | gcuguaccgg | gggcccuggg | accugcccaa  | 3000 |
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| cugccugcug  | ccuguggagg  | aggcuggcau | caucugggac | agcgucugcu | ucuucuuccu  | 4140 |

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|------------|------------|------------|-------------|------------|------------|------|
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| ggccaccgcc | cugcuagccu | ccaggggcuu | cgcccucuac  | aacgcugcca | accucaagag | 4260 |
| cauugacuuu | caccgcagga | uagaggagaa | gucccuaggcc | cagcugaaaa | gacagaugga | 4320 |
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|                                                                    |      |
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| cuuccccaag uacauccug cccccaacgg gcccgaagcc aaccuguga agcagcugca     | 7380 |
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| gaaggacacu gcguccccac ggccugcgug gcgcugccgu ccccccagug uacuguagag   | 8040 |
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|                                                                    |     |
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| ggagaaggag gaagaggaga aggcggcgcg cgggtccccg cgggtcagcc atggcgcgcc  | 180 |
| ggccccgggg ccccgccacc gcccacatagc gccgcggcgt ccgctcggtc tgggccgggc | 240 |
| cctgggccct ccagccatgg agccgcacgt gctcggcgcg gtcctgtact ggctgtgct   | 300 |
| gccctgcgcg ctgctggctg cctgcctgct ccgcttcagc ggactctcgc tggctctacct | 360 |

|                                                                    |      |
|--------------------------------------------------------------------|------|
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| cacaggccgc ctctgcggg cattgctggg cctcagcctg ctcttcctgg tggcccatct   | 480  |
| cgccctccag atctgcctgc atattgtgcc ccgcctggac cagctcctgg gacccagctg  | 540  |
| cagccgctgg gagaccctct cgcgacacat aggggtcaca aggctggacc tgaaggacat  | 600  |
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| ggatgatgat gagagggatg tggatgccag ccgcacggca gggctgcagg aagcagcaac  | 780  |
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| ccgcctgcc ggcatctggg ctaggggtgct gggctctcaag gacttcgtgg gtcccaccaa | 1140 |
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|                                                                      |      |
|----------------------------------------------------------------------|------|
| agagaagctg ctgaagtggg cagagtctcc agctgcgctg acggagggtca ccgtggcaga   | 1920 |
| cacagagccc acgcggacgc agacgctggt gcagagcctg ggggagctgg tgaagggcgt    | 1980 |
| gtacgccaag tactggatct atgtgtgtgc tggcatgttc atcgtgggtca gcttcgccgg   | 2040 |
| ccgcctcgtg gtctacaaga ttgtctacat gttcctcttc ctgctctgcc tcaccctctt    | 2100 |
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| ctacaccatg ctggtcctca tcgccgtcta caccttccag ttccaggact tccctgccta    | 2220 |
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| cttgctgccc acggagatca gccagtcctt gctgtaccgg gggcccgtgg accctgccaa    | 3000 |
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| gacctgcac ggttgctggc tgggtggccat cctcaccgc aggcaccgcc aggccattgc     | 3360 |

|             |             |            |             |             |             |      |
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| gttctcagct  | gagcgcacag  | aggagtggca | gcgcatggct  | ggcgtcaaca  | ccgaccgcct  | 3660 |
| ggagccgctg  | cggggggagc  | ccaaccccg  | gccccacttt  | atccactgca  | ggtcctacct  | 3720 |
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| cctgtgctc   | ttcggcacgg  | ccctgctgca | gagggacaca  | cgggcccgcc  | tcgtgctgtg  | 3900 |
| ggactgcctc  | attctgtaca  | acgtcaccgt | catcatctcc  | aagaacatgc  | tgtcgctcct  | 3960 |
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| ggaagaagag ggggagggaag agaaaagggc cccacggggg agagagaaga ggccaagccg | 6000 |
| ctctggagga agagtaaggg cggccgggcg gcggctgcag ggcttctgcc tgtccctggc  | 6060 |
| ccagggcaca tatcgccgc tacggcgctt cttccacgac atcctgcaca ccaagtaccg   | 6120 |
| cgcagccacc gacgtctatg ccctcatgtt cctggctgat gttgtcgact tcatcatcat  | 6180 |
| catttttggc ttctgggcct ttgggaagca ctcggcggcc acagacatca cgtcctccct  | 6240 |
| atcagacgac caggtacccg aggctttcct ggtcatgctg ctgatccagt tcagtaccat  | 6300 |
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| ggtggagctg cgggcagtga tggactgggt gtggacggac accacgctgt ccctgtccag  | 6660 |
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| cacggccgac atcacctgc gcttcacctg gaacttccag agggacctgg cgaaggagg    | 7200 |
| cactgtggag tatgccaacg agaagcacat gctggccctg gcccccaaca gcactgcacg  | 7260 |
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| caacctgctg cccatggtca ttttcagtga caaggtcagc ccaccgagcc tcggcttcct  | 7560 |
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| gcgcggattc ttcagcgaga tctgcactc cattatgttc gaggagctgc cgtgcgtgga   | 7680 |
| ccgcatcctc aagctctgcc aggacatctt cctggtgcgg gagactcggg agctggagct  | 7740 |
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|                                                                    |      |
|--------------------------------------------------------------------|------|
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| caaggccgcc agctgtgatg catcctcccg gcctgcctga gccctgatgc tgctgtcaga  | 7980 |
| gaaggacact gcgtccccac ggcctgcgtg gcgctgccgt ccccccacgtg tactgtagag | 8040 |
| tttttttttt aattaaataa tgttttatatt atacaaatgg acaatcaga             | 8089 |

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 <211> 2521  
 <212> PRT  
 <213> homo sapien

<400> 4

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Pro | His | Val | Leu | Gly | Ala | Val | Leu | Tyr | Trp | Leu | Leu | Leu | Pro |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Ala | Leu | Leu | Ala | Ala | Cys | Leu | Leu | Arg | Phe | Ser | Gly | Leu | Ser | Leu |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Tyr | Leu | Leu | Phe | Leu | Leu | Leu | Leu | Pro | Trp | Phe | Pro | Gly | Pro | Thr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Cys | Gly | Leu | Gln | Gly | His | Thr | Gly | Arg | Leu | Leu | Arg | Ala | Leu | Leu |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Leu | Ser | Leu | Leu | Phe | Leu | Val | Ala | His | Leu | Ala | Leu | Gln | Ile | Cys |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | His | Ile | Val | Pro | Arg | Leu | Asp | Gln | Leu | Leu | Gly | Pro | Ser | Cys | Ser |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Trp | Glu | Thr | Leu | Ser | Arg | His | Ile | Gly | Val | Thr | Arg | Leu | Asp | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Asp | Ile | Pro | Asn | Ala | Ile | Arg | Leu | Val | Ala | Pro | Asp | Leu | Gly | Ile |
|     |     | 115 |     |     |     |     | 120 |     |     |     | 125 |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Val | Val | Ser | Ser | Val | Cys | Leu | Gly | Ile | Cys | Gly | Arg | Leu | Ala | Arg |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

130

135

140

Asn Thr Arg Gln Ser Pro His Pro Arg Glu Leu Asp Asp Asp Glu Arg  
 145 150 155 160

Asp Val Asp Ala Ser Pro Thr Ala Gly Leu Gln Glu Ala Ala Thr Leu  
 165 170 175

Ala Pro Thr Arg Arg Ser Arg Leu Ala Ala Arg Phe Arg Val Thr Ala  
 180 185 190

His Trp Leu Leu Val Ala Ala Gly Arg Val Leu Ala Val Thr Leu Leu  
 195 200 205

Ala Leu Ala Gly Ile Ala His Pro Ser Ala Leu Ser Ser Val Tyr Leu  
 210 215 220

Leu Leu Phe Leu Ala Leu Cys Thr Trp Trp Ala Cys His Phe Pro Ile  
 225 230 235 240

Ser Thr Arg Gly Phe Ser Arg Leu Cys Val Ala Val Gly Cys Phe Gly  
 245 250 255

Ala Gly His Leu Ile Cys Leu Tyr Cys Tyr Gln Met Pro Leu Ala Gln  
 260 265 270

Ala Leu Leu Pro Pro Ala Gly Ile Trp Ala Arg Val Leu Gly Leu Lys  
 275 280 285

Asp Phe Val Gly Pro Thr Asn Cys Ser Ser Pro His Ala Leu Val Leu  
 290 295 300

Asn Thr Gly Leu Asp Trp Pro Val Tyr Ala Ser Pro Gly Val Leu Leu  
 305 310 315 320

Leu Leu Cys Tyr Ala Thr Ala Ser Leu Arg Lys Leu Arg Ala Tyr Arg  
 325 330 335

Pro Ser Gly Gln Arg Lys Glu Ala Ala Lys Gly Tyr Glu Ala Arg Glu  
340 345 350

Leu Glu Leu Ala Glu Leu Asp Gln Trp Pro Gln Glu Arg Glu Ser Asp  
355 360 365

Gln His Val Val Pro Thr Ala Pro Asp Thr Glu Ala Asp Asn Cys Ile  
370 375 380

Val His Glu Leu Thr Gly Gln Ser Ser Val Leu Arg Arg Pro Val Arg  
385 390 395 400

Pro Lys Arg Ala Glu Pro Arg Glu Ala Ser Pro Leu His Ser Leu Gly  
405 410 415

His Leu Ile Met Asp Gln Ser Tyr Val Cys Ala Leu Ile Ala Met Met  
420 425 430

Val Trp Ser Ile Thr Tyr His Ser Trp Leu Thr Phe Val Leu Leu Leu  
435 440 445

Trp Ala Cys Leu Ile Trp Thr Val Arg Ser Arg His Gln Leu Ala Met  
450 455 460

Leu Cys Ser Pro Cys Ile Leu Leu Tyr Gly Met Thr Leu Cys Cys Leu  
465 470 475 480

Arg Tyr Val Trp Ala Met Asp Leu Arg Pro Glu Leu Pro Thr Thr Leu  
485 490 495

Gly Pro Val Ser Leu Arg Gln Leu Gly Leu Glu His Thr Arg Tyr Pro  
500 505 510

Cys Leu Asp Leu Gly Ala Met Leu Leu Tyr Thr Leu Thr Phe Trp Leu  
515 520 525

Leu Leu Arg Gln Phe Val Lys Glu Lys Leu Leu Lys Trp Ala Glu Ser

530

535

540

Pro Ala Ala Leu Thr Glu Val Thr Val Ala Asp Thr Glu Pro Thr Arg  
 545 550 555 560

Thr Gln Thr Leu Leu Gln Ser Leu Gly Glu Leu Val Lys Gly Val Tyr  
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Ala Lys Tyr Trp Ile Tyr Val Cys Ala Gly Met Phe Ile Val Val Ser  
 580 585 590

Phe Ala Gly Arg Leu Val Val Tyr Lys Ile Val Tyr Met Phe Leu Phe  
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Leu Leu Cys Leu Thr Leu Phe Gln Val Tyr Tyr Ser Leu Trp Arg Lys  
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Leu Leu Lys Ala Phe Trp Trp Leu Val Val Ala Tyr Thr Met Leu Val  
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Leu Ile Ala Val Tyr Thr Phe Gln Phe Gln Asp Phe Pro Ala Tyr Trp  
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Arg Asn Leu Thr Gly Phe Thr Asp Glu Gln Leu Gly Asp Leu Gly Leu  
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Glu Gln Phe Ser Val Ser Glu Leu Phe Ser Ser Ile Leu Val Pro Gly  
 675 680 685

Phe Phe Leu Leu Ala Cys Ile Leu Gln Leu His Tyr Phe His Arg Pro  
 690 695 700

Phe Met Gln Leu Thr Asp Met Glu His Val Ser Leu Pro Gly Thr Arg  
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Leu Pro Arg Trp Ala His Arg Gln Asp Ala Val Ser Gly Thr Pro Leu  
 725 730 735

Leu Arg Glu Glu Gln Gln Glu His Gln Gln Gln Gln Gln Glu Glu Glu  
740 745 750

Glu Glu Glu Glu Asp Ser Arg Asp Glu Gly Leu Gly Val Ala Thr Pro  
755 760 765

His Gln Ala Thr Gln Val Pro Glu Gly Ala Ala Lys Trp Gly Leu Val  
770 775 780

Ala Glu Arg Leu Leu Glu Leu Ala Ala Gly Phe Ser Asp Val Leu Ser  
785 790 795 800

Arg Val Gln Val Phe Leu Arg Arg Leu Leu Glu Leu His Val Phe Lys  
805 810 815

Leu Val Ala Leu Tyr Thr Val Trp Val Ala Leu Lys Glu Val Ser Val  
820 825 830

Met Asn Leu Leu Leu Val Val Leu Trp Ala Phe Ala Leu Pro Tyr Pro  
835 840 845

Arg Phe Arg Pro Met Ala Ser Cys Leu Ser Thr Val Trp Thr Cys Val  
850 855 860

Ile Ile Val Cys Lys Met Leu Tyr Gln Leu Lys Val Val Asn Pro Gln  
865 870 875 880

Glu Tyr Ser Ser Asn Cys Thr Glu Pro Phe Pro Asn Ser Thr Asn Leu  
885 890 895

Leu Pro Thr Glu Ile Ser Gln Ser Leu Leu Tyr Arg Gly Pro Val Asp  
900 905 910

Pro Ala Asn Trp Phe Gly Val Arg Lys Gly Phe Pro Asn Leu Gly Tyr  
915 920 925

Ile Gln Asn His Leu Gln Val Leu Leu Leu Leu Val Phe Glu Ala Ile

930

935

940

Val Tyr Arg Arg Gln Glu His Tyr Arg Arg Gln His Gln Leu Ala Pro  
 945 950 955 960

Leu Pro Ala Gln Ala Val Phe Ala Ser Gly Thr Arg Gln Gln Leu Asp  
 965 970 975

Gln Asp Leu Leu Gly Cys Leu Lys Tyr Phe Ile Asn Phe Phe Phe Tyr  
 980 985 990

Lys Phe Gly Leu Glu Ile Cys Phe Leu Met Ala Val Asn Val Ile Gly  
 995 1000 1005

Gln Arg Met Asn Phe Leu Val Thr Leu His Gly Cys Trp Leu Val  
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Ala Ile Leu Thr Arg Arg His Arg Gln Ala Ile Ala Arg Leu Trp  
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Pro Asn Tyr Cys Leu Phe Leu Ala Leu Phe Leu Leu Tyr Gln Tyr  
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Leu Leu Cys Leu Gly Met Pro Pro Ala Leu Cys Ile Asp Tyr Pro  
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Trp Arg Trp Ser Arg Ala Val Pro Met Asn Ser Ala Leu Ile Lys  
 1070 1075 1080

Trp Leu Tyr Leu Pro Asp Phe Phe Arg Ala Pro Asn Ser Thr Asn  
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Leu Ile Ser Asp Phe Leu Leu Leu Leu Cys Ala Ser Gln Gln Trp  
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Gln Val Phe Ser Ala Glu Arg Thr Glu Glu Trp Gln Arg Met Ala  
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Gly Val Asn Thr Asp Arg Leu Glu Pro Leu Arg Gly Glu Pro Asn  
1130 1135 1140

Pro Val Pro Asn Phe Ile His Cys Arg Ser Tyr Leu Asp Met Leu  
1145 1150 1155

Lys Val Ala Val Phe Arg Tyr Leu Phe Trp Leu Val Leu Val Val  
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Val Phe Val Thr Gly Ala Thr Arg Ile Ser Ile Phe Gly Leu Gly  
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Tyr Leu Leu Ala Cys Phe Tyr Leu Leu Leu Phe Gly Thr Ala Leu  
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Leu Gln Arg Asp Thr Arg Ala Arg Leu Val Leu Trp Asp Cys Leu  
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Ile Leu Tyr Asn Val Thr Val Ile Ile Ser Lys Asn Met Leu Ser  
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Leu Leu Ala Cys Val Phe Val Glu Gln Met Gln Thr Gly Phe Cys  
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Trp Val Ile Gln Leu Phe Ser Leu Val Cys Thr Val Lys Gly Tyr  
1250 1255 1260

Tyr Asp Pro Lys Glu Met Met Asp Arg Asp Gln Asp Cys Leu Leu  
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Pro Val Glu Glu Ala Gly Ile Ile Trp Asp Ser Val Cys Phe Phe  
1280 1285 1290

Phe Leu Leu Leu Gln Arg Arg Val Phe Leu Ser His Tyr Tyr Leu  
1295 1300 1305

His Val Arg Ala Asp Leu Gln Ala Thr Ala Leu Leu Ala Ser Arg

1310

1315

1320

Gly Phe Ala Leu Tyr Asn Ala Ala Asn Leu Lys Ser Ile Asp Phe  
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His Arg Arg Ile Glu Glu Lys Ser Leu Ala Gln Leu Lys Arg Gln  
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Met Glu Arg Ile Arg Ala Lys Gln Glu Lys His Arg Gln Gly Arg  
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Val Asp Arg Ser Arg Pro Gln Asp Thr Leu Gly Pro Lys Asp Pro  
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Gly Leu Glu Pro Gly Pro Asp Ser Pro Gly Gly Ser Ser Pro Pro  
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Arg Arg Gln Trp Trp Arg Pro Trp Leu Asp His Ala Thr Val Ile  
 1400 1405 1410

His Ser Gly Asp Tyr Phe Leu Phe Glu Ser Asp Ser Glu Glu Glu  
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Glu Glu Ala Val Pro Glu Asp Pro Arg Pro Ser Ala Gln Ser Ala  
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Phe Gln Leu Ala Tyr Gln Ala Trp Val Thr Asn Ala Gln Ala Val  
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Leu Arg Arg Arg Gln Gln Glu Gln Glu Gln Ala Arg Gln Glu Gln  
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Ala Gly Gln Leu Pro Thr Gly Gly Gly Pro Ser Gln Glu Val Glu  
 1475 1480 1485

Pro Ala Glu Gly Pro Glu Glu Ala Ala Ala Gly Arg Ser His Val  
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Val Gln Arg Val Leu Ser Thr Ala Gln Phe Leu Trp Met Leu Gly  
1505 1510 1515

Gln Ala Leu Val Asp Glu Leu Thr Arg Trp Leu Gln Glu Phe Thr  
1520 1525 1530

Arg His His Gly Thr Met Ser Asp Val Leu Arg Ala Glu Arg Tyr  
1535 1540 1545

Leu Leu Thr Gln Glu Leu Leu Gln Gly Gly Glu Val His Arg Gly  
1550 1555 1560

Val Leu Asp Gln Leu Tyr Thr Ser Gln Ala Glu Ala Thr Leu Pro  
1565 1570 1575

Gly Pro Thr Glu Ala Pro Asn Ala Pro Ser Thr Val Ser Ser Gly  
1580 1585 1590

Leu Gly Ala Glu Glu Pro Leu Ser Ser Met Thr Asp Asp Met Gly  
1595 1600 1605

Ser Pro Leu Ser Thr Gly Tyr His Thr Arg Ser Gly Ser Glu Glu  
1610 1615 1620

Ala Val Thr Asp Pro Gly Glu Arg Glu Ala Gly Ala Ser Leu Tyr  
1625 1630 1635

Gln Gly Leu Met Arg Thr Ala Ser Glu Leu Leu Leu Asp Arg Arg  
1640 1645 1650

Leu Arg Ile Pro Glu Leu Glu Glu Ala Glu Leu Phe Ala Glu Gly  
1655 1660 1665

Gln Gly Arg Ala Leu Arg Leu Leu Arg Ala Val Tyr Gln Cys Val  
1670 1675 1680

Ala Ala His Ser Glu Leu Leu Cys Tyr Phe Ile Ile Ile Leu Asn

1685

1690

1695

His Met Val Thr Ala Ser Ala Gly Ser Leu Val Leu Pro Val Leu  
1700 1705 1710

Val Phe Leu Trp Ala Met Leu Ser Ile Pro Arg Pro Ser Lys Arg  
1715 1720 1725

Phe Trp Met Thr Ala Ile Val Phe Thr Glu Ile Ala Val Val Val  
1730 1735 1740

Lys Tyr Leu Phe Gln Phe Gly Phe Phe Pro Trp Asn Ser His Val  
1745 1750 1755

Val Leu Arg Arg Tyr Glu Asn Lys Pro Tyr Phe Pro Pro Arg Ile  
1760 1765 1770

Leu Gly Leu Glu Lys Thr Asp Gly Tyr Ile Lys Tyr Asp Leu Val  
1775 1780 1785

Gln Leu Met Ala Leu Phe Phe His Arg Ser Gln Leu Leu Cys Tyr  
1790 1795 1800

Gly Leu Trp Asp His Glu Glu Asp Ser Pro Ser Lys Glu His Asp  
1805 1810 1815

Lys Ser Gly Glu Glu Glu Gln Gly Ala Glu Glu Gly Pro Gly Val  
1820 1825 1830

Pro Ala Ala Thr Thr Glu Asp His Ile Gln Val Glu Ala Arg Val  
1835 1840 1845

Gly Pro Thr Asp Gly Thr Pro Glu Pro Gln Val Glu Leu Arg Pro  
1850 1855 1860

Arg Asp Thr Arg Arg Ile Ser Leu Arg Phe Arg Arg Arg Lys Lys  
1865 1870 1875

Glu Gly Pro Ala Arg Lys Gly Ala Ala Ala Ile Glu Ala Glu Asp  
1880 1885 1890

Arg Glu Glu Glu Gly Glu Glu Glu Lys Glu Ala Pro Thr Gly  
1895 1900 1905

Arg Glu Lys Arg Pro Ser Arg Ser Gly Gly Arg Val Arg Ala Ala  
1910 1915 1920

Gly Arg Arg Leu Gln Gly Phe Cys Leu Ser Leu Ala Gln Gly Thr  
1925 1930 1935

Tyr Arg Pro Leu Arg Arg Phe Phe His Asp Ile Leu His Thr Lys  
1940 1945 1950

Tyr Arg Ala Ala Thr Asp Val Tyr Ala Leu Met Phe Leu Ala Asp  
1955 1960 1965

Val Val Asp Phe Ile Ile Ile Ile Phe Gly Phe Trp Ala Phe Gly  
1970 1975 1980

Lys His Ser Ala Ala Thr Asp Ile Thr Ser Ser Leu Ser Asp Asp  
1985 1990 1995

Gln Val Pro Glu Ala Phe Leu Val Met Leu Leu Ile Gln Phe Ser  
2000 2005 2010

Thr Met Val Val Asp Arg Ala Leu Tyr Leu Arg Lys Thr Val Leu  
2015 2020 2025

Gly Lys Leu Ala Phe Gln Val Ala Leu Val Leu Ala Ile His Leu  
2030 2035 2040

Trp Met Phe Phe Ile Leu Pro Ala Val Thr Glu Arg Met Phe Asn  
2045 2050 2055

Gln Asn Val Val Ala Gln Leu Trp Tyr Phe Val Lys Cys Ile Tyr

2060

2065

2070

Phe Ala Leu Ser Ala Tyr Gln Ile Arg Cys Gly Tyr Pro Thr Arg  
 2075 2080 2085

Ile Leu Gly Asn Phe Leu Thr Lys Lys Tyr Asn His Leu Asn Leu  
 2090 2095 2100

Phe Leu Phe Gln Gly Phe Arg Leu Val Pro Phe Leu Val Glu Leu  
 2105 2110 2115

Arg Ala Val Met Asp Trp Val Trp Thr Asp Thr Thr Leu Ser Leu  
 2120 2125 2130

Ser Ser Trp Met Cys Val Glu Asp Ile Tyr Ala Asn Ile Phe Ile  
 2135 2140 2145

Ile Lys Cys Ser Arg Glu Thr Glu Lys Lys Tyr Pro Gln Pro Lys  
 2150 2155 2160

Gly Gln Lys Lys Lys Lys Ile Val Lys Tyr Gly Met Gly Gly Leu  
 2165 2170 2175

Ile Ile Leu Phe Leu Ile Ala Ile Ile Trp Phe Pro Leu Leu Phe  
 2180 2185 2190

Met Ser Leu Val Arg Ser Val Val Gly Val Val Asn Gln Pro Ile  
 2195 2200 2205

Asp Val Thr Val Thr Leu Lys Leu Gly Gly Tyr Glu Pro Leu Phe  
 2210 2215 2220

Thr Met Ser Ala Gln Gln Pro Ser Ile Ile Pro Phe Thr Ala Gln  
 2225 2230 2235

Ala Tyr Glu Glu Leu Ser Arg Gln Phe Asp Pro Gln Pro Leu Ala  
 2240 2245 2250

Met Gln Phe Ile Ser Gln Tyr Ser Pro Glu Asp Ile Val Thr Ala  
2255 2260 2265

Gln Ile Glu Gly Ser Ser Gly Ala Leu Trp Arg Ile Ser Pro Pro  
2270 2275 2280

Ser Arg Ala Gln Met Lys Arg Glu Leu Tyr Asn Gly Thr Ala Asp  
2285 2290 2295

Ile Thr Leu Arg Phe Thr Trp Asn Phe Gln Arg Asp Leu Ala Lys  
2300 2305 2310

Gly Gly Thr Val Glu Tyr Ala Asn Glu Lys His Met Leu Ala Leu  
2315 2320 2325

Ala Pro Asn Ser Thr Ala Arg Arg Gln Leu Ala Ser Leu Leu Glu  
2330 2335 2340

Gly Thr Ser Asp Gln Ser Val Val Ile Pro Asn Leu Phe Pro Lys  
2345 2350 2355

Tyr Ile Arg Ala Pro Asn Gly Pro Glu Ala Asn Pro Val Lys Gln  
2360 2365 2370

Leu Gln Pro Asn Glu Glu Ala Asp Tyr Leu Gly Val Arg Ile Gln  
2375 2380 2385

Leu Arg Arg Glu Gln Gly Ala Gly Ala Thr Gly Phe Leu Glu Trp  
2390 2395 2400

Trp Val Ile Glu Leu Gln Glu Cys Arg Thr Asp Cys Asn Leu Leu  
2405 2410 2415

Pro Met Val Ile Phe Ser Asp Lys Val Ser Pro Pro Ser Leu Gly  
2420 2425 2430

Phe Leu Ala Gly Tyr Gly Ile Met Gly Leu Tyr Val Ser Ile Val

2435

2440

2445

Leu Val Ile Gly Lys Phe Val Arg Gly Phe Phe Ser Glu Ile Ser  
2450 2455 2460

His Ser Ile Met Phe Glu Glu Leu Pro Cys Val Asp Arg Ile Leu  
2465 2470 2475

Lys Leu Cys Gln Asp Ile Phe Leu Val Arg Glu Thr Arg Glu Leu  
2480 2485 2490

Glu Leu Glu Glu Glu Leu Tyr Ala Lys Leu Ile Phe Leu Tyr Arg  
2495 2500 2505

Ser Pro Glu Thr Met Ile Lys Trp Thr Arg Glu Lys Glu  
2510 2515 2520