

SEQUENCE LISTING

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<140> TBC

<141> 2019-02-19

<150> GB 1802744.1

<151> 2018-02-20

<160> 136

<170> PatentIn version 3.5

<210> 1

<211> 2325

<212> DNA

<213> Artificial Sequence

<220>

<223> DNA polymerase from Thermococcus sp. KS-1

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<211> 774

<212> PRT
<213> Artificial Sequence

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<223> DNA polymerase from Thermococcus sp. KS-1

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Thr Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
35 40 45

Glu Glu Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Val Val Thr
50 55 60

Val Lys Arg Ala Glu Lys Val Gln Lys Lys Phe Leu Gly Arg Pro Val
65 70 75 80

Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
85 90 95

Arg Asp Lys Ile Arg Glu His Pro Ala Val Ile Asp Ile Tyr Glu Tyr
100 105 110

Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro
115 120 125

Met Glu Gly Asp Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
130 135 140

Leu Tyr His Glu Gly Glu Glu Phe Ala Glu Gly Pro Ile Leu Met Ile
145 150 155 160

Ser Tyr Ala Asp Glu Glu Gly Ala Arg Val Ile Thr Trp Lys Asn Ala
165 170 175

Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Arg Glu Met Ile Lys
180 185 190

Arg Phe Leu Lys Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Thr
195 200 205

Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu
210 215 220

Lys Leu Gly Ile Asn Phe Thr Leu Gly Arg Asp Gly Ser Glu Pro Lys
225 230 235 240

Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
245 250 255

His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
260 265 270

Tyr Thr Leu Glu Ala Val Tyr Glu Ala Val Phe Gly Gln Pro Lys Glu
275 280 285

Lys Val Tyr Ala Glu Glu Ile Ala Thr Ala Trp Glu Ser Gly Glu Gly
290 295 300

Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Tyr
305 310 315 320

Glu Leu Gly Lys Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
325 330 335

Ile Gly Gln Ser Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
340 345 350

Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
355 360 365

Pro Asn Lys Pro Asp Glu Lys Glu Leu Ala Arg Arg Arg Gln Ser Tyr
370 375 380

Glu Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
385 390 395 400

Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
405 410 415

Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Lys Glu Tyr Asp
420 425 430

Val Ala Pro Gln Val Gly His Arg Phe Cys Lys Asp Phe Pro Gly Phe
435 440 445

Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Ile Lys
450 455 460

Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu Leu Asp
465 470 475 480

Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Tyr Tyr Gly Tyr
485 490 495

Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Lys Glu Cys Ala Glu Ser
500 505 510

Val Thr Ala Trp Gly Arg Glu Tyr Ile Thr Met Thr Ile Arg Glu Ile
515 520 525

Glu Glu Lys Tyr Gly Phe Lys Val Ile Tyr Ser Asp Thr Asp Gly Phe
530 535 540

Phe Ala Thr Ile Pro Gly Ala Asp Ala Glu Thr Val Lys Lys Lys Ala
545 550 555 560

Met Glu Phe Leu Lys Tyr Ile Asn Ala Lys Leu Pro Gly Ala Leu Glu
565 570 575

Leu Glu Tyr Glu Gly Phe Tyr Lys Arg Gly Phe Phe Val Thr Lys Lys
580 585 590

Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
595 600 605

Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala
610 615 620

Arg Val Leu Glu Ala Leu Leu Lys Asp Gly Asp Val Glu Lys Ala Val
625 630 635 640

Arg Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
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Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Asp Leu Lys Asp
660 665 670

Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Ala
675 680 685

Arg Gly Val Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
690 695 700

Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
705 710 715 720

Asp Pro Thr Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
725 730 735

Val Leu Pro Ala Val Glu Arg Ile Leu Arg Ala Phe Gly Tyr Arg Lys
740 745 750

Glu Asp Leu Arg Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp
755 760 765

Leu Lys Pro Lys Gly Thr
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<210> 3
<211> 2325
<212> DNA
<213> Artificial Sequence

<220>
<223> DNA polymerase from Thermococcus celer

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<210> 4
<211> 774
<212> PRT
<213> Artificial Sequence

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<220>
<223> DNA polymerase from Thermococcus celer

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<400> 4

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Met Ile Leu Asp Ala Asp Tyr Ile Thr Glu Asp Gly Lys Pro Val Val
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Arg Ile Phe Arg Lys Glu Lys Gly Glu Phe Arg Ile Asp Tyr Asp Arg
          20          25          30

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Asp Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
          35          40          45

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Glu Glu Val Lys Arg Ile Thr Val Glu Arg His Gly Lys Ala Val Arg
          50          55          60

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Val Lys Arg Val Glu Lys Val Glu Lys Lys Phe Leu Asn Arg Pro Ile
65           70           75          80

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Glu Val Trp Lys Leu Tyr Phe Asn His Pro Gln Asp Val Pro Ala Ile
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Arg Asp Glu Ile Arg Lys His Pro Ala Val Val Asp Ile Tyr Glu Tyr
100 105 110

Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro
115 120 125

Met Glu Gly Glu Glu Glu Leu Lys Leu Met Ala Phe Asp Ile Glu Thr
130 135 140

Leu Tyr His Glu Gly Asp Glu Phe Gly Glu Gly Pro Ile Leu Met Ile
145 150 155 160

Ser Tyr Ala Asp Gly Asp Gly Ala Arg Val Ile Thr Trp Lys Lys Ile
165 170 175

Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Lys Glu Met Ile Lys
180 185 190

Arg Phe Leu Gln Val Val Lys Glu Lys Asp Pro Asp Val Leu Val Thr
195 200 205

Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Arg Arg Ser Glu
210 215 220

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

Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
245 250 255

His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Val Asn Leu Pro Thr
260 265 270

Tyr Thr Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Arg Pro Lys Glu
275 280 285

Lys Val Tyr Ala Gly Glu Ile Val Glu Ala Trp Glu Thr Gly Glu Gly
290 295 300

Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Phe
305 310 315 320

Glu Leu Gly Arg Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
325 330 335

Ile Gly Gln Gly Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
340 345 350

Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
355 360 365

Pro Asn Lys Pro Ser Gly Arg Glu Val Glu Ile Arg Arg Arg Gly Tyr
370 375 380

Ala Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
385 390 395 400

Val Tyr Leu Asp Phe Arg Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
405 410 415

Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Glu Asn Tyr Asp
420 425 430

Val Ala Pro Gln Val Gly His Lys Phe Cys Lys Asp Phe Pro Gly Phe
435 440 445

Ile Pro Ser Leu Leu Gly Gly Leu Leu Glu Glu Arg Gln Lys Ile Lys
450 455 460

Arg Arg Met Lys Ala Ser Val Asp Pro Val Glu Arg Lys Leu Leu Asp
465 470 475 480

Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Phe Tyr Gly Tyr
485 490 495

Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Arg Glu Cys Ala Glu Ser
500 505 510

Val Thr Ala Trp Gly Arg Glu Tyr Ile Asp Arg Val Ile Arg Glu Leu
515 520 525

Glu Glu Lys Phe Gly Phe Lys Val Leu Tyr Ala Asp Thr Asp Gly Leu
530 535 540

His Ala Thr Ile Pro Gly Ala Asp Ala Gly Thr Val Lys Glu Arg Ala
545 550 555 560

Arg Gly Phe Leu Arg Tyr Ile Asn Pro Lys Leu Pro Gly Leu Leu Glu
565 570 575

Leu Glu Tyr Glu Gly Phe Tyr Leu Arg Gly Phe Phe Val Thr Lys Lys
580 585 590

Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
595 600 605

Glu Ile Val Arg Arg Asp Trp Ser Glu Val Ala Lys Glu Thr Gln Ala
610 615 620

Arg Val Leu Glu Ala Ile Leu Arg His Gly Asp Val Glu Glu Ala Val
625 630 635 640

Arg Ile Val Arg Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
645 650 655

Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Asp Leu Arg Asp
660 665 670

Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Gly
675 680 685

Arg Gly Val Arg Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
690 695 700

Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
705 710 715 720

Asp Pro Thr Lys His Arg Tyr Asp Ala Asp Tyr Tyr Ile Glu Asn Gln
725 730 735

Val Leu Pro Ala Val Glu Arg Ile Leu Lys Ala Phe Gly Tyr Arg Lys
740 745 750

Glu Asp Leu Lys Tyr Gln Lys Thr Arg Gln Val Gly Leu Gly Ala Trp
755 760 765

Leu Asn Ala Gly Lys Gly
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<211> 2328
<212> DNA
<213> Artificial Sequence

<220>
<223> DNA polymerase from *Thermococcus sicuti*

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<211> 775

<212> PRT

<213> Artificial Sequence

<220>

<223> DNA polymerase from *Thermococcus siculi*

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20 25 30

Thr Phe Glu Pro Tyr Ile Tyr Ala Leu Leu Lys Asp Asp Ser Ala Ile
35 40 45

Glu Asp Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Val Val Lys
50 55 60

Val Lys Arg Ala Glu Lys Val Gln Lys Lys Phe Leu Gly Arg Pro Val
65 70 75 80

Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
85 90 95

Arg Asp Lys Ile Arg Lys His Pro Ala Val Ile Asp Ile Tyr Glu Tyr
100 105 110

Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Ile Pro
115 120 125

Met Glu Gly Glu Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
130 135 140

Leu Tyr His Glu Gly Glu Glu Phe Ala Glu Gly Pro Ile Leu Met Ile
145 150 155 160

Ser Tyr Ala Asp Glu Ser Glu Ala Arg Val Ile Thr Trp Lys Lys Ile
165 170 175

Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Lys Glu Met Ile Lys
180 185 190

Arg Phe Leu Arg Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Thr
195 200 205

Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu
210 215 220

Lys Leu Gly Ile Asn Phe Leu Leu Gly Arg Asp Gly Ser Glu Pro Lys
225 230 235 240

Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
245 250 255

His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
260 265 270

Tyr Met Leu Glu Ala Val Tyr Glu Ala Ile Phe Gly Lys Pro Lys Glu
275 280 285

Lys Val Tyr Ala Glu Glu Ile Ala Thr Ala Trp Glu Thr Gly Glu Gly
290 295 300

Leu Glu Arg Val Ala Arg Tyr Ser Met Glu Asp Ala Lys Val Thr Phe
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Glu Leu Gly Lys Glu Phe Phe Pro Met Glu Ala Gln Leu Ser Arg Leu
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Val Gly Gln Ser Phe Trp Asp Val Ala Arg Ser Ser Thr Gly Asn Leu
340 345 350

Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
355 360 365

Pro Asn Lys Pro Ser Gly Arg Glu Tyr Asp Glu Arg Arg Gly Gly Tyr
370 375 380

Ala Gly Gly Tyr Val Lys Glu Pro Glu Lys Gly Leu Trp Glu Asn Ile
385 390 395 400

Val Tyr Leu Asp Tyr Lys Ser Leu Tyr Pro Ser Ile Ile Ile Thr His
405 410 415

Asn Val Ser Pro Asp Thr Leu Asn Arg Glu Gly Cys Lys Glu Tyr Asp
420 425 430

Val Ala Pro Gln Val Gly His Arg Phe Cys Lys Asp Phe Pro Gly Phe
435 440 445

Ile Pro Ser Leu Leu Gly Asp Leu Leu Glu Glu Arg Gln Lys Ile Lys
450 455 460

Arg Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu Leu Asp
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Tyr Arg Gln Arg Ala Ile Lys Ile Leu Leu Asn Ser Phe Tyr Gly Tyr
485 490 495

Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Lys Glu Cys Ala Glu Ser
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Val Thr Ala Trp Gly Arg Glu Tyr Ile Thr Met Thr Ile Arg Glu Ile
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Glu Glu Lys Tyr Gly Phe Lys Val Leu Tyr Ala Asp Thr Asp Gly Phe
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Phe Ala Thr Ile Pro Gly Glu Asp Ala Glu Thr Ile Lys Lys Arg Ala
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Met Glu Phe Leu Lys Tyr Ile Asn Ala Lys Leu Pro Gly Ala Leu Glu
565 570 575

Leu Glu Tyr Glu Asp Phe Tyr Arg Arg Gly Phe Phe Val Thr Lys Lys
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Lys Tyr Ala Val Ile Asp Glu Glu Gly Lys Ile Thr Thr Arg Gly Leu
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Glu Ile Val Arg Arg Asp Trp Ser Glu Ile Ala Lys Glu Thr Gln Ala
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Arg Val Leu Glu Ala Leu Leu Lys Asp Gly Asp Val Glu Glu Ala Val
625 630 635 640

Ser Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
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Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Glu Leu Lys Asp
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Tyr Lys Ala Thr Gly Pro His Val Ala Ile Ala Lys Arg Leu Ala Ala
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Arg Gly Val Lys Ile Arg Pro Gly Thr Val Ile Ser Tyr Ile Val Leu
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Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
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Asp Pro Thr Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
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Val Leu Pro Ala Val Glu Arg Ile Leu Lys Ala Phe Gly Tyr Arg Gly
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Glu Glu Val Lys Lys Ile Thr Ala Glu Arg His Gly Thr Val Val Thr
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Val Lys Arg Val Glu Lys Val Gln Lys Lys Phe Leu Gly Arg Pro Val
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Glu Val Trp Lys Leu Tyr Phe Thr His Pro Gln Asp Val Pro Ala Ile
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Arg Asp Lys Ile Arg Glu His Pro Ala Val Ile Asp Ile Tyr Glu Tyr
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Asp Ile Pro Phe Ala Lys Arg Tyr Leu Ile Asp Lys Gly Leu Val Pro
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Met Glu Gly Asp Glu Glu Leu Lys Met Leu Ala Phe Asp Ile Glu Thr
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Ser Tyr Ala Asp Glu Glu Gly Ala Arg Val Ile Thr Trp Lys Asn Val
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Asp Leu Pro Tyr Val Asp Val Val Ser Thr Glu Arg Glu Met Ile Lys
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Arg Phe Leu Arg Val Val Lys Glu Lys Asp Pro Asp Val Leu Ile Thr
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Tyr Asn Gly Asp Asn Phe Asp Phe Ala Tyr Leu Lys Lys Arg Cys Glu
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Lys Leu Gly Ile Asn Phe Ala Leu Gly Arg Asp Gly Ser Glu Pro Lys
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Ile Gln Arg Met Gly Asp Arg Phe Ala Val Glu Val Lys Gly Arg Ile
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His Phe Asp Leu Tyr Pro Val Ile Arg Arg Thr Ile Asn Leu Pro Thr
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Tyr Thr Leu Glu Ala Val Tyr Glu Ala Val Phe Gly Gln Pro Lys Glu
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Lys Val Tyr Ala Glu Glu Ile Thr Thr Ala Trp Glu Thr Gly Glu Asn
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Glu Leu Gly Lys Glu Phe Leu Pro Met Glu Ala Gln Leu Ser Arg Leu
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Ile Gly Gln Ser Leu Trp Asp Val Ser Arg Ser Ser Thr Gly Asn Leu
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Val Glu Trp Phe Leu Leu Arg Lys Ala Tyr Glu Arg Asn Glu Leu Ala
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Pro Asn Lys Pro Asp Glu Lys Glu Leu Ala Arg Arg Arg Gln Ser Tyr
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Glu Gly Gly Tyr Val Lys Glu Pro Glu Arg Gly Leu Trp Glu Asn Ile
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Lys Lys Met Lys Ala Thr Ile Asp Pro Ile Glu Arg Lys Leu Leu Asp
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Tyr Arg Gln Arg Ala Ile Lys Ile Leu Ala Asn Ser Tyr Tyr Gly Tyr
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Tyr Gly Tyr Ala Arg Ala Arg Trp Tyr Cys Lys Glu Cys Ala Glu Ser
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Leu Glu Tyr Glu Gly Phe Tyr Glu Arg Gly Phe Phe Val Thr Lys Lys
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Arg Val Leu Glu Ala Leu Leu Lys Asp Gly Asp Val Glu Lys Ala Val
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Arg Ile Val Lys Glu Val Thr Glu Lys Leu Ser Lys Tyr Glu Val Pro
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Pro Glu Lys Leu Val Ile His Glu Gln Ile Thr Arg Asp Leu Lys Asp
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Tyr Lys Ala Thr Gly Pro His Val Ala Val Ala Lys Arg Leu Ala Ala
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Lys Gly Ser Gly Arg Ile Gly Asp Arg Ala Ile Pro Phe Asp Glu Phe
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Asp Pro Thr Lys His Lys Tyr Asp Ala Glu Tyr Tyr Ile Glu Asn Gln
725 730 735

Val Leu Pro Ala Val Glu Arg Ile Leu Arg Ala Phe Gly Tyr Arg Lys
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