

## pT7\_WT-ASD\_rRNA (10223 bp)

gtcatcaccgaaacgcgcgaggcagctgcggtaaagctcatcagcgtggctgtaagcgattcacagatgtctgcctgttcatccgcgtccagctcgttgagtttct  
cagtagtggctttgcgcgctccgtcgacgccatttcgagtagtcgcaccagcacttcgctaagtgtctacagacggacaagtaggcgcaggtcgagcaactcaaaga

« rop »

10 20 30 40 50 60 70 80 90 100

ccagaagcgttaatgtctggcttctgataaagcgggcatgttaagggcggttttttctgtttggtcactgatgcctccgtgtaaggggatttctgttcatgggg  
ggtcttcgaattacagaccgaagactatttcgcccgtacaattcccgcacaaaaggacaaaccagtactacggaggcacattcccctaaagacaagtacccc

« rop »

110 120 130 140 150 160 170 180 190 200 210

gtaatgataccgatgaaacgagagaggatgtcacgatacgggttactgatgatgaacatgcccgttactggaacgttgtaggggtaacaactggcggtatggat  
cattactatggctactttgtctctcctacgagtgtatgcccaatgactactacttgtacgggccaatgaccttgcaacactcccatttgttgaccgccataccta

220 230 240 250 260 270 280 290 300 310 320

gcgcgccggaccagagaaaaatcactcagggtcaatgccagcgttcgttaatacagatgtaggtgtccacagggtagccagcagcatcctgcgatgcagatccgga  
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330 340 350 360 370 380 390 400 410 420

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430 440 450 460 470 480 490 500 510 520 530

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540 550 560 570 580 590 600 610 620 630 640

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«

650 660 670 680 690 700 710 720 730 740

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« lacI »

750 760 770 780 790 800 810 820 830 840 850

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« lacI »

860 870 880 890 900 910 920 930 940 950 960

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« lacI »

970 980 990 1,000 1,010 1,020 1,030 1,040 1,050 1,060 1,070

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« lacI »

1,080 1,090 1,100 1,110 1,120 1,130 1,140 1,150 1,160 1,170

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« lacI »

1,180 1,190 1,200 1,210 1,220 1,230 1,240 1,250 1,260 1,270 1,280

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« lacI »

1,290 1,300 1,310 1,320 1,330 1,340 1,350 1,360 1,370 1,380 1,390

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« lacI »

1,400 1,410 1,420 1,430 1,440 1,450 1,460 1,470 1,480 1,490

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« lacI »

1,500 1,510 1,520 1,530 1,540 1,550 1,560 1,570 1,580 1,590 1,600

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« lacI »

1,610 1,620 1,630 1,640 1,650 1,660 1,670 1,680 1,690 1,700 1,710

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« lacI »

1,720 1,730 1,740 1,750 1,760 1,770 1,780 1,790 1,800 1,810



ggatgaccagccacactggaactgagacacggtccagactcctacgggaggcagcagtggggaatatgacacatgggcgcaagcctgatgcagccatgccgctgt  
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» 16SrRNA 1~1453 »

2,790 2,800 2,810 2,820 2,830 2,840 2,850 2,860 2,870 2,880

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» 16SrRNA 1~1453 »

2,890 2,900 2,910 2,920 2,930 2,940 2,950 2,960 2,970 2,980 2,990

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» 16SrRNA 1~1453 »

3,000 3,010 3,020 3,030 3,040 3,050 3,060 3,070 3,080 3,090 3,100

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» 16SrRNA 1~1453 »

3,110 3,120 3,130 3,140 3,150 3,160 3,170 3,180 3,190 3,200 3,210

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» 16SrRNA 1~1453 »

3,220 3,230 3,240 3,250 3,260 3,270 3,280 3,290 3,300 3,310

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» 16SrRNA 1~1453 »

3,320 3,330 3,340 3,350 3,360 3,370 3,380 3,390 3,400 3,410 3,420

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» 16SrRNA 1~1453 »

3,430 3,440 3,450 3,460 3,470 3,480 3,490 3,500 3,510 3,520 3,530

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cgacgtaccgacagcagtcgagcacaacactttacaaccaattcaggcggtgtcgtcgttgggaataggaacaacggtcgccaggccggcccttgagtttcctc

» 16SrRNA 1~1453 »

3,540 3,550 3,560 3,570 3,580 3,590 3,600 3,610 3,620 3,630

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» 16SrRNA 1~1453 »

3,640 3,650 3,660 3,670 3,680 3,690 3,700 3,710 3,720 3,730 3,740

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» 16SrRNA 1~1453 »

3,750 3,760 3,770 3,780 3,790 3,800 3,810 3,820 3,830 3,840 3,850

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» 16SrRNA 1~1453 16S rRNA 1454~1542 »

3,860 3,870 3,880 3,890 3,900 3,910 3,920 3,930 3,940 3,950

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» 16S rRNA 1454~1542 »

3,960 3,970 3,980 3,990 4,000 4,010 4,020 4,030 4,040 4,050 4,060

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4,070 4,080 4,090 4,100 4,110 4,120 4,130 4,140 4,150 4,160 4,170

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4,180 4,190 4,200 4,210 4,220 4,230 4,240 4,250 4,260 4,270 4,280

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4,290 4,300 4,310 4,320 4,330 4,340 4,350 4,360 4,370 4,380

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» 23S rRNA 1~2857 »

4,390 4,400 4,410 4,420 4,430 4,440 4,450 4,460 4,470 4,480 4,490

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» 23S rRNA 1~2857 »

4,500 4,510 4,520 4,530 4,540 4,550 4,560 4,570 4,580 4,590 4,600

ttcgacacactatcattaactgaatccataggttaatgaggcgaaccgggggaactgaaacatctaagtaccccgaggaaaagaatcaaccgagattccccagta  
aagctgtgtgatagtaattgacttaggtatccaattactccgcttgcccccttgactttgtagattcatggggctccttttcttttagttggctctaaggggtcat

» 23S rRNA 1~2857 »

4,610 4,620 4,630 4,640 4,650 4,660 4,670 4,680 4,690 4,700

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» 23S rRNA 1~2857 »

4,710 4,720 4,730 4,740 4,750 4,760 4,770 4,780 4,790 4,800 4,810

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» 23S rRNA 1~2857 »

4,820 4,830 4,840 4,850 4,860 4,870 4,880 4,890 4,900 4,910 4,920

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» 23S rRNA 1~2857 »

4,930 4,940 4,950 4,960 4,970 4,980 4,990 5,000 5,010 5,020

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» 23S rRNA 1~2857 »

5,030 5,040 5,050 5,060 5,070 5,080 5,090 5,100 5,110 5,120 5,130

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» 23S rRNA 1~2857 »

5,140 5,150 5,160 5,170 5,180 5,190 5,200 5,210 5,220 5,230 5,240

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» 23S rRNA 1~2857 »

5,250 5,260 5,270 5,280 5,290 5,300 5,310 5,320 5,330 5,340 5,350

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» 23S rRNA 1~2857 »

5,360 5,370 5,380 5,390 5,400 5,410 5,420 5,430 5,440 5,450

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» 23S rRNA 1~2857 »

5,460 5,470 5,480 5,490 5,500 5,510 5,520 5,530 5,540 5,550 5,560

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» 23S rRNA 1~2857 »

5,570 5,580 5,590 5,600 5,610 5,620 5,630 5,640 5,650 5,660 5,670

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» 23S rRNA 1~2857 »

5,680 5,690 5,700 5,710 5,720 5,730 5,740 5,750 5,760 5,770

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» 23S rRNA 1~2857 »

5,780 5,790 5,800 5,810 5,820 5,830 5,840 5,850 5,860 5,870 5,880

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» 23S rRNA 1~2857 »

5,890 5,900 5,910 5,920 5,930 5,940 5,950 5,960 5,970 5,980 5,990

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» 23S rRNA 1~2857 »

6,000 6,010 6,020 6,030 6,040 6,050 6,060 6,070 6,080 6,090

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» 23S rRNA 1~2857 »

6,100 6,110 6,120 6,130 6,140 6,150 6,160 6,170 6,180 6,190 6,200

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» 23S rRNA 1~2857 »

6,210 6,220 6,230 6,240 6,250 6,260 6,270 6,280 6,290 6,300 6,310

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» 23S rRNA 1~2857 »

6,320 6,330 6,340 6,350 6,360 6,370 6,380 6,390 6,400 6,410 6,420

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» 23S rRNA 1~2857 »

6,430 6,440 6,450 6,460 6,470 6,480 6,490 6,500 6,510 6,520

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» 23S rRNA 1~2857 »

6,530 6,540 6,550 6,560 6,570 6,580 6,590 6,600 6,610 6,620 6,630

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» 23S rRNA 1~2857 »

6,640 6,650 6,660 6,670 6,680 6,690 6,700 6,710 6,720 6,730 6,740

aggagcacgaaggttggctaatacctggctcgacatcaggaggttagtgcaatggcataagccagcttgactgcgagcgtgacggcgcgagcaggtgcgaaagcaggt  
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» 23S rRNA 1~2857 »

6,750 6,760 6,770 6,780 6,790 6,800 6,810 6,820 6,830 6,840

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» 23S rRNA 1~2857 »

6,850 6,860 6,870 6,880 6,890 6,900 6,910 6,920 6,930 6,940 6,950

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» 23S rRNA 1~2857 »

6,960 6,970 6,980 6,990 7,000 7,010 7,020 7,030 7,040 7,050 7,060

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» 23S rRNA 1~2857 »

7,070 7,080 7,090 7,100 7,110 7,120 7,130 7,140 7,150 7,160

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» 23S rRNA 1~2857 »

7,170 7,180 7,190 7,200 7,210 7,220 7,230 7,240 7,250 7,260 7,270

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» 23S rRNA 1~2857 23S rRNA 2858~2904 »

7,280 7,290 7,300 7,310 7,320 7,330 7,340 7,350 7,360 7,370 7,380

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5S rRNA »

7,390 7,400 7,410 7,420 7,430 7,440 7,450 7,460 7,470 7,480 7,490

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» 5S rRNA »

7,500 7,510 7,520 7,530 7,540 7,550 7,560 7,570 7,580 7,590

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T7 terminator

7,600 7,610 7,620 7,630 7,640 7,650 7,660 7,670 7,680 7,690 7,700

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f1 ori »

7,710 7,720 7,730 7,740 7,750 7,760 7,770 7,780 7,790 7,800 7,810

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» f1 ori »

7,820 7,830 7,840 7,850 7,860 7,870 7,880 7,890 7,900 7,910

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f1 ori »

7,920 7,930 7,940 7,950 7,960 7,970 7,980 7,990 8,000 8,010 8,020

acaacactcaaccctatctcgggtctattcttttgatttataagggattttgccgatttcggcctatttggttaaaaaatgagctgatttaacaaaaatttaacgcgaa  
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» f1 ori »

8,030 8,040 8,050 8,060 8,070 8,080 8,090 8,100 8,110 8,120 8,130

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» f1 ori »

8,140 8,150 8,160 8,170 8,180 8,190 8,200 8,210 8,220 8,230

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« KanR »

8,240 8,250 8,260 8,270 8,280 8,290 8,300 8,310 8,320 8,330 8,340

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« KanR »

8,350 8,360 8,370 8,380 8,390 8,400 8,410 8,420 8,430 8,440 8,450

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« KanR »

8,460 8,470 8,480 8,490 8,500 8,510 8,520 8,530 8,540 8,550 8,560

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« KanR »

8,570 8,580 8,590 8,600 8,610 8,620 8,630 8,640 8,650 8,660

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« KanR »

8,670 8,680 8,690 8,700 8,710 8,720 8,730 8,740 8,750 8,760 8,770

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« KanR »

8,780 8,790 8,800 8,810 8,820 8,830 8,840 8,850 8,860 8,870 8,880

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«« KanR »»

8,890 8,900 8,910 8,920 8,930 8,940 8,950 8,960 8,970 8,980

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«« KanR »»

8,990 9,000 9,010 9,020 9,030 9,040 9,050 9,060 9,070 9,080 9,090

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ori »»

9,100 9,110 9,120 9,130 9,140 9,150 9,160 9,170 9,180 9,190 9,200

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»» ori »»

9,210 9,220 9,230 9,240 9,250 9,260 9,270 9,280 9,290 9,300

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»» ori »»

9,310 9,320 9,330 9,340 9,350 9,360 9,370 9,380 9,390 9,400 9,410

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»» ori »»

9,420 9,430 9,440 9,450 9,460 9,470 9,480 9,490 9,500 9,510 9,520

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»» ori »»

9,530 9,540 9,550 9,560 9,570 9,580 9,590 9,600 9,610 9,620 9,630

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»» ori »»

9,640 9,650 9,660 9,670 9,680 9,690 9,700 9,710 9,720 9,730

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ori

9,740 9,750 9,760 9,770 9,780 9,790 9,800 9,810 9,820 9,830 9,840

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9,850 9,860 9,870 9,880 9,890 9,900 9,910 9,920 9,930 9,940 9,950

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bom

9,960 9,970 9,980 9,990 10,000 10,010 10,020 10,030 10,040 10,050

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bom

10,060 10,070 10,080 10,090 10,100 10,110 10,120 10,130 10,140 10,150 10,160

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rop

10,170 10,180 10,190 10,200 10,210 10,220

## pT7\_or1-oASD\_rRNA(SpcR) (10223 bp)

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« rop »

10 20 30 40 50 60 70 80 90 100

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« rop »

110 120 130 140 150 160 170 180 190 200 210

gtaatgataccgatgaacgagagaggatgtcacgatacgggttactgatgatgaacatgcccggttactggaacgttgtaggggtaacaactggcggtatggat  
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220 230 240 250 260 270 280 290 300 310 320

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330 340 350 360 370 380 390 400 410 420

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430 440 450 460 470 480 490 500 510 520 530

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540 550 560 570 580 590 600 610 620 630 640

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«

650 660 670 680 690 700 710 720 730 740

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« lacI »

750 760 770 780 790 800 810 820 830 840 850

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« lacI »

860 870 880 890 900 910 920 930 940 950 960

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« lacI »

970 980 990 1,000 1,010 1,020 1,030 1,040 1,050 1,060 1,070

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« lacI »

1,080 1,090 1,100 1,110 1,120 1,130 1,140 1,150 1,160 1,170

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« lacI »

1,180 1,190 1,200 1,210 1,220 1,230 1,240 1,250 1,260 1,270 1,280

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« lacI »

1,290 1,300 1,310 1,320 1,330 1,340 1,350 1,360 1,370 1,380 1,390

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« lacI »

1,400 1,410 1,420 1,430 1,440 1,450 1,460 1,470 1,480 1,490

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« lacI »

1,500 1,510 1,520 1,530 1,540 1,550 1,560 1,570 1,580 1,590 1,600

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« lacI »

1,610 1,620 1,630 1,640 1,650 1,660 1,670 1,680 1,690 1,700 1,710

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« lacI »

1,720 1,730 1,740 1,750 1,760 1,770 1,780 1,790 1,800 1,810



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» 16SrRNA 1~1453 »

2,790 2,800 2,810 2,820 2,830 2,840 2,850 2,860 2,870 2,880

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» 16SrRNA 1~1453 »

2,890 2,900 2,910 2,920 2,930 2,940 2,950 2,960 2,970 2,980 2,990

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» 16SrRNA 1~1453 »

3,000 3,010 3,020 3,030 3,040 3,050 3,060 3,070 3,080 3,090 3,100

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» 16SrRNA 1~1453 »

3,110 3,120 3,130 3,140 3,150 3,160 3,170 3,180 3,190 3,200 3,210

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» 16SrRNA 1~1453 »

3,220 3,230 3,240 3,250 3,260 3,270 3,280 3,290 3,300 3,310

gtgcccttgaggcgtggcttccggagctaacgcgttaagtcgaccgcctggggagtacggccgcaaggttaaaactcaaatgaattgacggggcccgcacaaagcg  
cacgggaactccgcaccgaaggcctcgattgcgcaattcagctggcgaccctcatgccggttccaatttgagttacttaactgccccgggcgtgttcgcc

» 16SrRNA 1~1453 »

3,320 3,330 3,340 3,350 3,360 3,370 3,380 3,390 3,400 3,410 3,420

tggagcatgtggtttaattcgatgcaacgcgaagaaccttacctggctcttgacatccacggaagtttcagagatgagaatgtgccttcgggaaccgtgagacaggt  
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» 16SrRNA 1~1453 »

3,430 3,440 3,450 3,460 3,470 3,480 3,490 3,500 3,510 3,520 3,530

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» 16SrRNA 1~1453 »

3,540 3,550 3,560 3,570 3,580 3,590 3,600 3,610 3,620 3,630

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 » 16S rRNA 1454~1542 »

3,860 3,870 3,880 3,890 3,900 3,910 3,920 3,930 3,940 3,950

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» 16S rRNA 1454~1542 »

3,960 3,970 3,980 3,990 4,000 4,010 4,020 4,030 4,040 4,050 4,060

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4,070 4,080 4,090 4,100 4,110 4,120 4,130 4,140 4,150 4,160 4,170

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4,180 4,190 4,200 4,210 4,220 4,230 4,240 4,250 4,260 4,270 4,280

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4,290 4,300 4,310 4,320 4,330 4,340 4,350 4,360 4,370 4,380

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tgttgcctcaacaagcactcagagagtttaaaagcgttggtctactacttagctttctttagtagaagcccaactccaattcgctgattcgcatgtgccactac

» 23S rRNA 1~2857 »

4,390 4,400 4,410 4,420 4,430 4,440 4,450 4,460 4,470 4,480 4,490

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» 23S rRNA 1~2857 »

4,500 4,510 4,520 4,530 4,540 4,550 4,560 4,570 4,580 4,590 4,600

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» 23S rRNA 1~2857 »

4,610 4,620 4,630 4,640 4,650 4,660 4,670 4,680 4,690 4,700

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

4,820 4,830 4,840 4,850 4,860 4,870 4,880 4,890 4,900 4,910 4,920

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

5,250 5,260 5,270 5,280 5,290 5,300 5,310 5,320 5,330 5,340 5,350

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

5,680 5,690 5,700 5,710 5,720 5,730 5,740 5,750 5,760 5,770

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 » 23S rRNA 2858~2904 »

7,280 7,290 7,300 7,310 7,320 7,330 7,340 7,350 7,360 7,370 7,380

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5S rRNA »

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» 5S rRNA »

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T7 terminator

7,600 7,610 7,620 7,630 7,640 7,650 7,660 7,670 7,680 7,690 7,700

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f1 ori »

7,710 7,720 7,730 7,740 7,750 7,760 7,770 7,780 7,790 7,800 7,810

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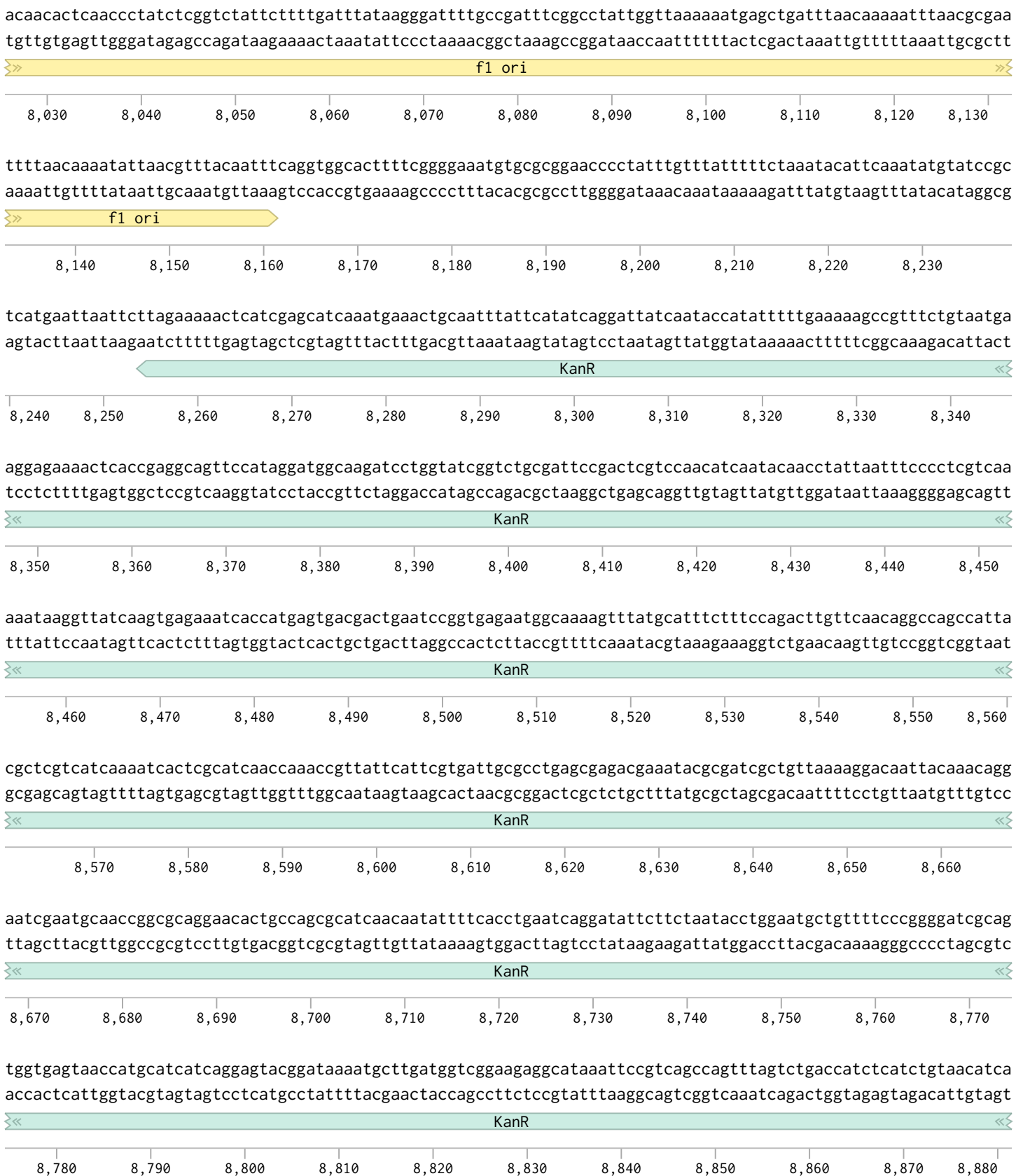
» f1 ori »

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f1 ori »

7,920 7,930 7,940 7,950 7,960 7,970 7,980 7,990 8,000 8,010 8,020



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«« KanR »»

8,890 8,900 8,910 8,920 8,930 8,940 8,950 8,960 8,970 8,980

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«« KanR »»

8,990 9,000 9,010 9,020 9,030 9,040 9,050 9,060 9,070 9,080 9,090

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ori »»

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»» ori »»

9,210 9,220 9,230 9,240 9,250 9,260 9,270 9,280 9,290 9,300

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»» ori »»

9,310 9,320 9,330 9,340 9,350 9,360 9,370 9,380 9,390 9,400 9,410

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»» ori »»

9,420 9,430 9,440 9,450 9,460 9,470 9,480 9,490 9,500 9,510 9,520

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»» ori »»

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»» ori »»

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ori

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bom

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bom

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rop

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« rop »

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« rop »

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«

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

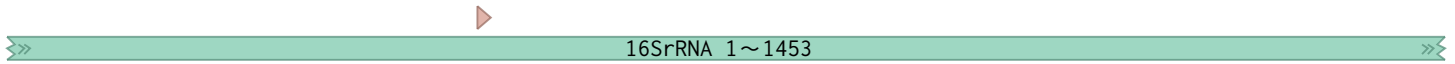
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» 16SrRNA 1~1453 »

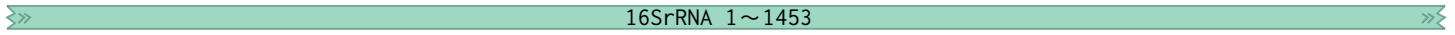
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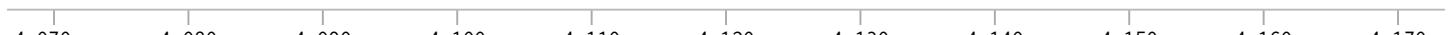
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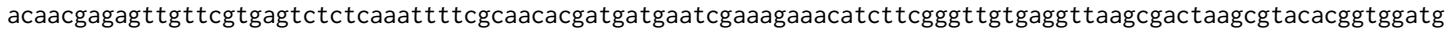
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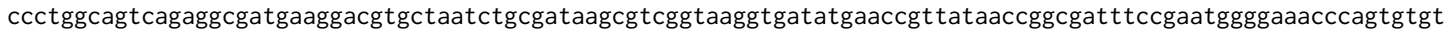
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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 » 23S rRNA 2858~2904 »

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5S rRNA »

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» 5S rRNA »

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T7 terminator

7,600 7,610 7,620 7,630 7,640 7,650 7,660 7,670 7,680 7,690 7,700

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f1 ori »

7,710 7,720 7,730 7,740 7,750 7,760 7,770 7,780 7,790 7,800 7,810

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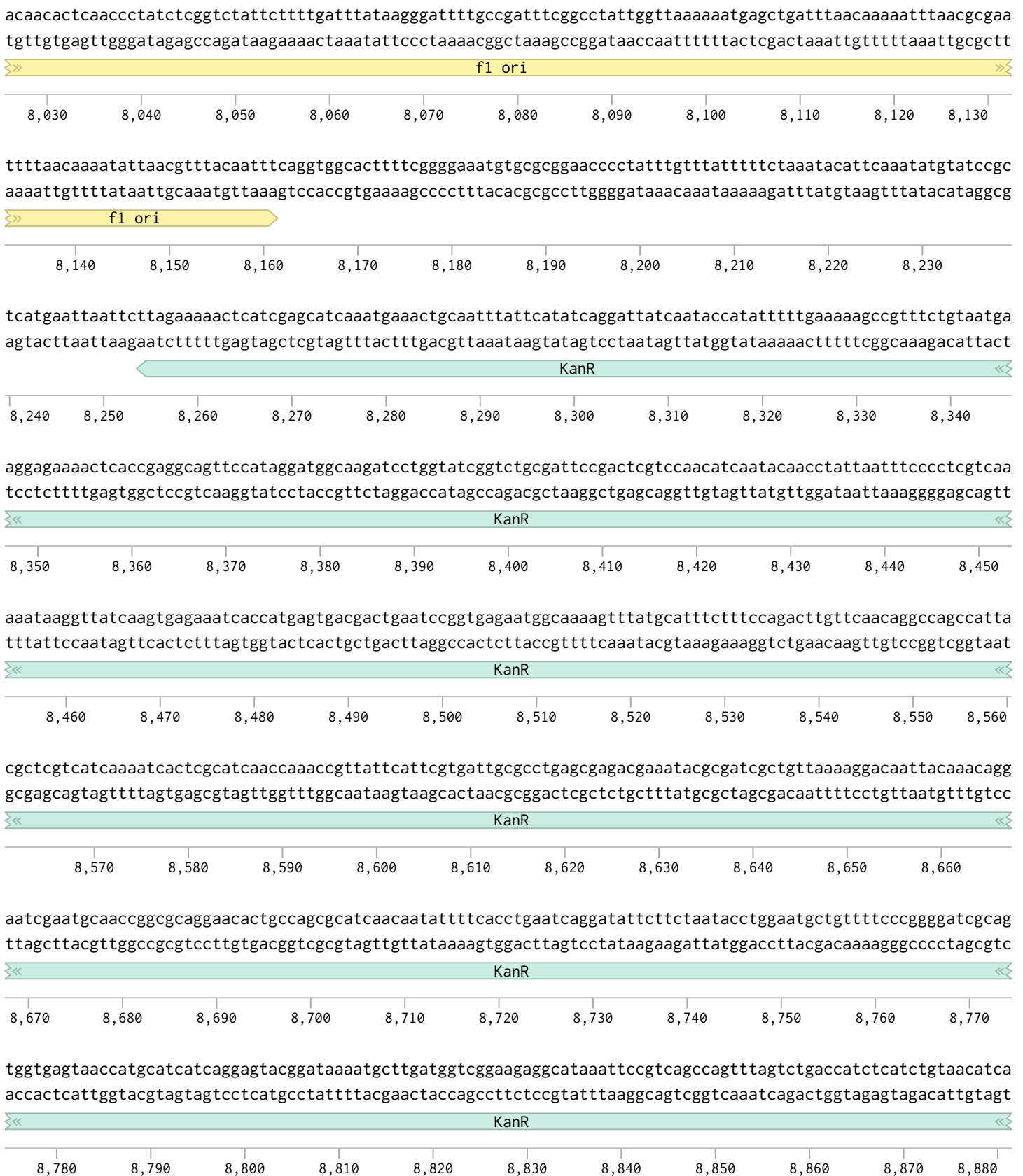
» f1 ori »

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f1 ori »

7,920 7,930 7,940 7,950 7,960 7,970 7,980 7,990 8,000 8,010 8,020



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«« KanR »»

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«« KanR »»

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ori »»

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»» ori »»

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»» ori »»

9,310 9,320 9,330 9,340 9,350 9,360 9,370 9,380 9,390 9,400 9,410

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»» ori »»

9,420 9,430 9,440 9,450 9,460 9,470 9,480 9,490 9,500 9,510 9,520

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»» ori »»

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»» ori »»

9,640 9,650 9,660 9,670 9,680 9,690 9,700 9,710 9,720 9,730

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ori

9,740 9,750 9,760 9,770 9,780 9,790 9,800 9,810 9,820 9,830 9,840

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bom

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bom

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10,170 10,180 10,190 10,200 10,210 10,220

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

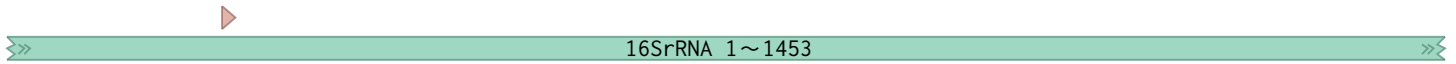
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» 16SrRNA 1~1453 »

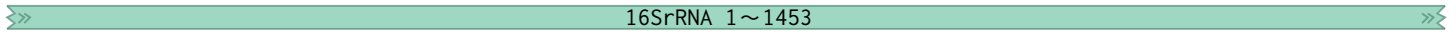
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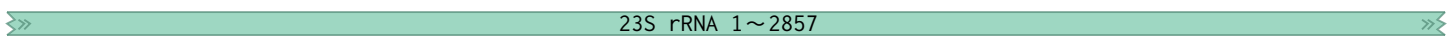
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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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» 23S rRNA 1~2857 »

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rrnB T2 terminator »

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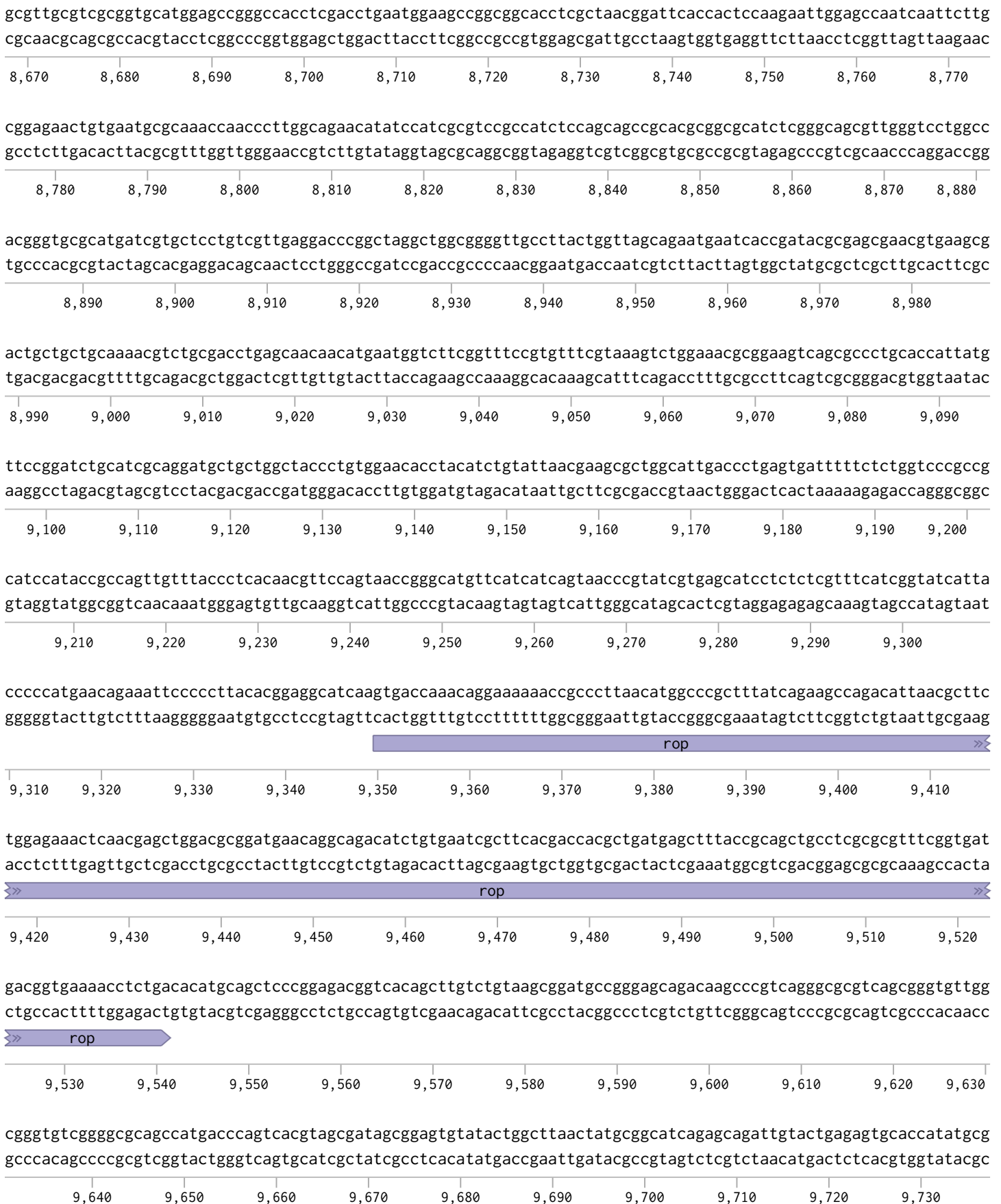
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ColE1 origin

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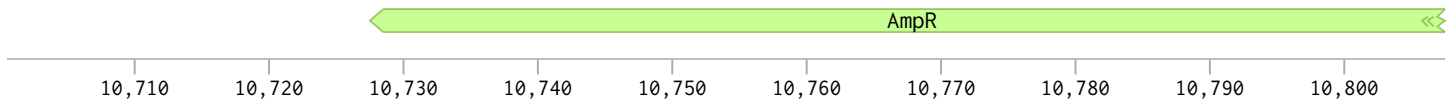
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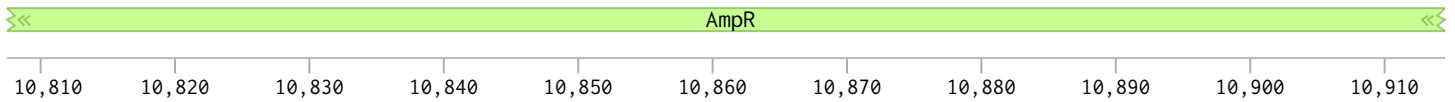
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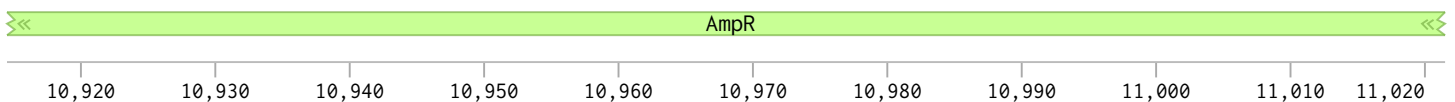
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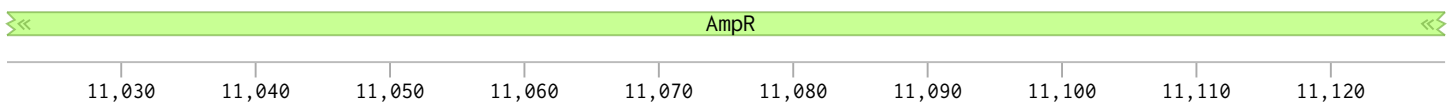
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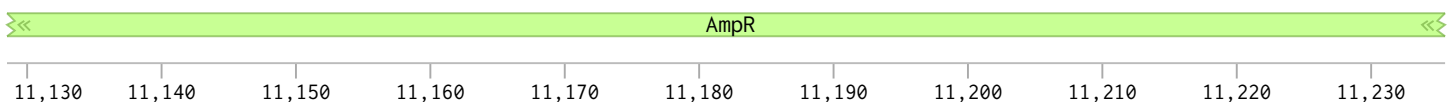
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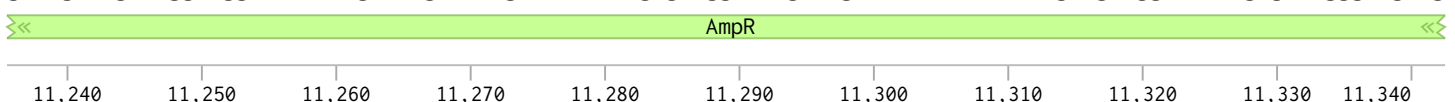
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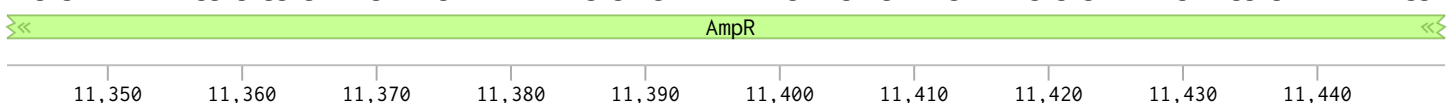
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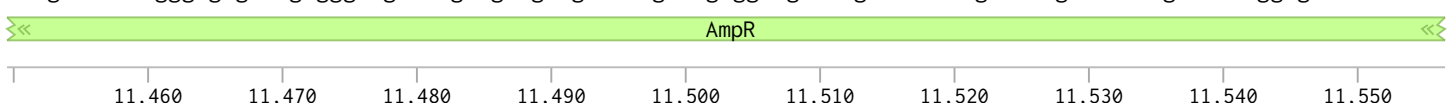
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◀◀ AmpR ▶◀ AmpR promoter ▶▶

11,560 11,570 11,580 11,590 11,600 11,610 11,620 11,630 11,640 11,650 11,660

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◀◀ AmpR promoter ▶

11,670 11,680 11,690 11,700 11,710 11,720 11,730 11,740 11,750 11,760 11,770

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« rop »

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« rop »

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«

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« lacI »

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« lacI »

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« lacI »

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« lacI »

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« lacI »

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« lacI »

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« lacI lacI promoter

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T7 promoter

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lac operator rrnG antiterminator »

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» rrnG antiterminator

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16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

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» 16SrRNA 1~1453 »

3,320 3,330 3,340 3,350 3,360 3,370 3,380 3,390 3,400 3,410 3,420

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acctcgtaaccaaattaagctacgttgcgcttcttggaaatggaccagaactgtaggtgccttcaaagtcttactcttacacggaagGAGCTCGGGCTGGTCTTA

Strept...r 30S »

» 16SrRNA 1~1453 »

3,430 3,440 3,450 3,460 3,470 3,480 3,490 3,500 3,510 3,520 3,530

CATGCAAGTGCCTAAGATAGTCGCGGGCCGGGCTAGCgggaaccgtgagacaggtgctgcatggctgtcgtcagctcgtgttgtaaagtgtgggttaagtcccga  
GTACGTTACGCATTCTATCAGCGCCCGCCGATCGccttggcactctgtccacgacgtaccgacagcagtcgagcacaacactttacaaccaattcaggcggt

» Streptavidin S1 aptamer for 30S »

» 16SrRNA 1~1453 »

3,540 3,550 3,560 3,570 3,580 3,590 3,600 3,610 3,620 3,630

acgagcgcaacccttatcctttgttgccagcggtccggccgggaactcaaaggagactgccagtgataaactggaggaaggtggggatgatgtcaagtcacatggc  
tgctcgcgttgggaataggaacaacggtcgccaggccggcccttgagtttctctgacggctactatttgacctcctccaccctactacagttcagtagtaccg

» 16SrRNA 1~1453 »

3,640 3,650 3,660 3,670 3,680 3,690 3,700 3,710 3,720 3,730 3,740

ccttacgaccagggtacacacgtgctacaatggcgcatacaagagaagcgacctcgcgagagcaagcggacctcataaagtgcgtcgtagtcggattggagtct  
ggaatgctggtcccgatgtgtgcacgatgttaccgcgtatgtttctcttcgctggagcgctctcgttcgcctggagtatttcacgcagcatcaggcctaacctcaga

» 16SrRNA 1~1453 »

3,750 3,760 3,770 3,780 3,790 3,800 3,810 3,820 3,830 3,840 3,850

gcaactcgactccatgaagtcggaatcgctagtaatcgtggatcagaatgccacggtgaatacgttcccgggccttgtaacacaccgcccgtcacaccatgggagtg  
cgttgagctgaggtacttcagccttagcgatcatttagcaccttagtcttacggtgccacttatgcaagggcccgaacatgtgtggcgggcagtggtgtaccctcacc

» 16SrRNA 1~1453 »

3,860 3,870 3,880 3,890 3,900 3,910 3,920 3,930 3,940 3,950

gttgcaaaagaagtaggtagcttaaccttcgggaggcgcttaccactttgtgattcatgactgggggtgaagtcgtaacaaggtaaccgtaggggaacctgcggttg  
caacgtttttctcatccatcgaaattggaagccctcccgcgaatggtgaaacactaagtactgacccacttcagcattgttccattggcatccccttggacgccaac

» 16SrRNA 1~1453 » 16S rRNA 1454~1542 »

3,960 3,970 3,980 3,990 4,000 4,010 4,020 4,030 4,040 4,050 4,060

gatcaCGAGACTaccttaaagaagcgactttgtagtgtcacacagattgtctgatagaaagtgaaaagcaaggcgtttacgcgttgggagtgaggctgaagagaa  
ctagtGCTCTGatggaatttcttcgatgaaacatcacgagtggtgctaacagactatctttcacttttcgttccgcaaatgcgcaaccctcactccgacttctctt

» 16S...42 »

4,070 4,080 4,090 4,100 4,110 4,120 4,130 4,140 4,150 4,160 4,170

taaggccgttcgctttctattaatgaaagctcacccctacacgaaaatatcacgcaacgcgtgataagcaattttcgtgtccccttcgtctagaggcccaggacaccg  
attccggcaagcgaaagataattactttcgagtgggatgtgcttttatagtgcggttgccactattcggttaaagcacaggggaagcagatctccgggtcctgtggc

4,180 4,190 4,200 4,210 4,220 4,230 4,240 4,250 4,260 4,270 4,280

ccctttcacggcggtaacaggggttcgaatcccctaggggacgccacttgctggtttgtgagtgaagtcgccgaccttaatatctcaaaactcatcttcgggtgat  
gggaaagtgcgcatgtgtcccgaagcttaggggatcccctgcggtgaacgaccaaactcactttcagcggttggaattatagagttttgagtagaagccacta

4,290 4,300 4,310 4,320 4,330 4,340 4,350 4,360 4,370 4,380

gtttgagatatttgctctttaaaaatctggatcaagctgaaaattgaacactgaacaacgagagttgttcgtgagtctctcaaattttcgcaacacgatgatgaat  
caaacctctataaacgagaaatttttagacctagttcgacttttaactttgtgacttgttgccttcaacaagcactcagagagtttaaaagcgttgtgctactactta

4,390 4,400 4,410 4,420 4,430 4,440 4,450 4,460 4,470 4,480 4,490

cgaagaaacatcttcgggttgtaggttaagcgactaagcgctacacggtggatgccctggcagtcagaggcgatgaaggacgtgctaactctgcgataagcgctcgg  
gctttctttgtagaagcccaactccaattcgctgattcgcatgtgccactacgggaccgtcagtcctccgctacttctgcacgattagacgctatttcgcagcca

23S rRNA 1~2857 »

4,500 4,510 4,520 4,530 4,540 4,550 4,560 4,570 4,580 4,590 4,600

aagtgatatgaaccgttataaccggcgatttccgaatggggaaaccagtggtttcgacacactatcattaactgaatccataggttaatgaggcgaaccggggg  
ttccactatacttggcaatatgtggcgcgtaaaggcttaccctttgggtcacacaaagctgtgtgatagtaattgacttaggtatccaattactccgcttggcccc

» 23S rRNA 1~2857 »

4,610 4,620 4,630 4,640 4,650 4,660 4,670 4,680 4,690 4,700

aactgaaacatctaagtaccccgaggaaaagaaatcaaccgagattccccagtagcggcgagcgaacggggagcagcccagagcctgaatcagtggtgtgttagt  
ttgactttgtagattcatggggctccttttcttagttggctctaagggggtcatcgccgctcgcttgccctcgtcgggtctcggacttagtcacacacacaatca

» 23S rRNA 1~2857 »

4,710 4,720 4,730 4,740 4,750 4,760 4,770 4,780 4,790 4,800 4,810

ggaagcgtctggaaaggcgcgcgatacagggtgacagccccgtacacaaaaatgcacatgctgtgagctcgatgagtagggcgggacacgtggtatcctgtctgaat  
ccttcgcagacctttccgcgcgtatgtcccactgtcggggcatgtgttttacctgtacgacactcgagctactcatcccgccctgtgcacataggacagactta

» 23S rRNA 1~2857 »

4,820 4,830 4,840 4,850 4,860 4,870 4,880 4,890 4,900 4,910 4,920

atggggggaccatcctccaaggctaaatactcctgactgaccgatagtgaaaccagtagcgtgagggaaggcgaagaacccccggcgaggggagtgaaaaagaacc  
taccctcctggtaggaggttccgatttatgaggactgactggctatcacttgggtcatggcactccctttccgcttttcttggggcgctccctcactttttcttgg

» 23S rRNA 1~2857 »

4,930 4,940 4,950 4,960 4,970 4,980 4,990 5,000 5,010 5,020

tgaaccgtgtacgtacaagcagtgaggagcacgcttGGGTACCGGCTGGGCCGACCAGAATCATGCAAGTGCCTAAGATAGTCGCGGGCCGCCGCCGGGCTACTC  
actttggcacatgcatttctgcaccctcgtgcgaacCCATGGCCGACCCGGCTGGTCTTAGTACGTTACGCATTCTATCAGCGCCCGCCGGCCGCCGCCATGAG

» Streptavidin S1 aptamer for 50S »  
» 23S rRNA 1~2857 »

5,030 5,040 5,050 5,060 5,070 5,080 5,090 5,100 5,110 5,120 5,130

aggcgtgtgactgcgtaccttttgtataatgggtcagcgacttatattctgtagcaaggttaaccgaataggggagccgaagggaaccgagtccttaactgggcgtt  
tccgcacactgacgcatggaacacatattaccagtcgctgaatataagacatcgttccaattggcttatccctcggcttccctttgggtcagaattgaccgcaa

» 23S rRNA 1~2857 »

5,140 5,150 5,160 5,170 5,180 5,190 5,200 5,210 5,220 5,230 5,240

aagttgcagggtatagaccgaaaccggtgatctagccatgggcaggttgaaggttgggtaacactaactggaggaccgaaccgactaatgttgaaaaattagcg  
ttcaacgtcccatatctgggcttggggcactagatcggtacccgtccaacttcaaccatttgtattgacctcctggcttggctgattacaacttttaacgcc

» 23S rRNA 1~2857 »

5,250 5,260 5,270 5,280 5,290 5,300 5,310 5,320 5,330 5,340 5,350

atgacttgtggctgggggtgaaaggccaatcaaaccgggagatagctggttctccccgaaagctatttaggtagcgcctcgtgaattcatctccgggggtagagcac  
tactgaacaccgacccccactttccggttagtttggccctctatcgaccaagagggttctcgataaatccatcgcgaggacacttaagtagaggcccccatctcgtg

» 23S rRNA 1~2857 »

5,360 5,370 5,380 5,390 5,400 5,410 5,420 5,430 5,440 5,450

tgtttcggcaaggggtcatcccgacttaccaaccgatgcaaactgcaataccggagaatgttatcacgggagacacacggcggtgctaacgtccgtcgtgaag  
 acaaagccgttccccagtagggctgaatggttgggctacgtttgacgcttatggcctcttacaatagtgccctctgtgtgccgcccacgattgcaggcagcacttc

23S rRNA 1~2857

5,460 5,470 5,480 5,490 5,500 5,510 5,520 5,530 5,540 5,550 5,560

agggaaacaaccagaccgccagctaaggtcccaaagtcatggttaagtgggaacgatgtgggaaggcccagacagccaggatgttggttagaagcagccatcat  
 tccctttgttgggtctggcggtcgattccagggttcagtagcaattcaccctttgtacacccttcgggtctgtcggctctacaaccgaatcttcgtcggtagta

23S rRNA 1~2857

5,570 5,580 5,590 5,600 5,610 5,620 5,630 5,640 5,650 5,660 5,670

ttaaagaaagcgtaatagctcactggtcgagtcggcctgcgcggaagatgtaacggggctaaccatgcaccgaagctcggcgagcgacgcttatgcgttgttgggt  
 aatttctttcgattatcgagtgcaccgtcagccggacgcgcttctacattgccccgatttggtacgtggcttcgacgccgtcgctgcgaatacgaacaacca

23S rRNA 1~2857

5,680 5,690 5,700 5,710 5,720 5,730 5,740 5,750 5,760 5,770

aggggagcggttctgtaagcctgcgaaggtgtgctgtgaggcatgctggaggtatcagaagtgcgaatgctgacataagtaacgataaagcgggtgaaaagcccgtc  
 tccccctgcgaagacattcggacgcttcacacgacactccgtacgactccatagcttccacgcttacgactgtattcattgctatttcgcccacttttcgggcgag

23S rRNA 1~2857

5,780 5,790 5,800 5,810 5,820 5,830 5,840 5,850 5,860 5,870 5,880

gccggaagaccaagggttctgtccaacgttaatcggggcagggtgagtcgaccctaaggcgaggccgaaaggcgtagtcgatgggaacagggttaatatctctgt  
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23S rRNA 1~2857

5,890 5,900 5,910 5,920 5,930 5,940 5,950 5,960 5,970 5,980 5,990

acttggtgttactgcaaggggggacggagaaggctatgttgccggggcgacggttgtcccggtttaagcgtgtaggctggttttccaggcaaattccggaaaatcaa  
 tgaaccacaatgacgcttccccctgcctcttccgatacaaccggcccgtgccaacagggccaaattcgccacatccgacaaaagggtccgttttaggccttttagtt

23S rRNA 1~2857

6,000 6,010 6,020 6,030 6,040 6,050 6,060 6,070 6,080 6,090

ggctgaggcgtgatgacgaggcactacggtgctgaagcaacaatgccctgcttcaggaaaagcctctaagcatcaggtaacatcaaattcgtaacccaaaccgaca  
 ccgactccgcactactgctccgtgatgccacgacttcgttgtttacgggacgaaggctcttttcggagattcgtagtccattgtagtttagcatgggggttggctgt

23S rRNA 1~2857

6,100 6,110 6,120 6,130 6,140 6,150 6,160 6,170 6,180 6,190 6,200

cagggtggtcaggtagagaataccaaggcgttgagagaactcgggtgaagggaactaggcaaaatggtgccgtaacttcgggagaaggcacgctgatatgtaggtgag  
 gtccaccagtccatctcttatggttccgcaactctcttgagcccacttccttgatccgttttaccacggcatgaagccctcttcggtgcgactatacatccactc

23S rRNA 1~2857

6,210 6,220 6,230 6,240 6,250 6,260 6,270 6,280 6,290 6,300 6,310

gtccctcgcggatggagctgaaatcagtcgaagataccagctggctgcaactgtttattaaaaacacagcactgtgcaaacacgaaagtggacgtatacgggtgtgac  
caggagcgcctacctcgactttagtcagcttctatggtcgaccgacgttgacaataatTTTTGTGTCGTGACAGCTTTGTGCTTTCACCTGCATATGCCACTG

» 23S rRNA 1~2857 »

6,320 6,330 6,340 6,350 6,360 6,370 6,380 6,390 6,400 6,410 6,420

gcctgcccgggtgccggaaggTTAATTGATGGGGTTAGCGCAAGCGAAGCTCTTGATCGAAGCCCCGTAACGGCGGCCGTAACATAACGGTCTAAGGTAGCGAA  
CGGACGGGCCACGGCTTCCAATTAACACCCCAATCGCGTTCGCTTCGAGAAGTAGCTTCGGGGCATTTCGCCCGGCATTGATATTGCCAGGATCCATCGCTT

» 23S rRNA 1~2857 »

6,430 6,440 6,450 6,460 6,470 6,480 6,490 6,500 6,510 6,520

attccttgtcgggtaagttccgacctgcacgaatggcgtaatgatggccaggctgtctccaccgagactcagtgaattgaactcgtgtgaagatgcagtgtacc  
taaggaacagcccatcaaggctggacgtgttaccgcattactaccggctccgacagaggtgggctctgagtcactttaacttgagcgacacttctacgtcacatgg

» 23S rRNA 1~2857 »

6,530 6,540 6,550 6,560 6,570 6,580 6,590 6,600 6,610 6,620 6,630

cgcggcaagacggTaagaccccgTgaacctttactatagcttgacactgaacattgagccttgatgtgtaggataggtgggaggctttgaagtgtggacgccagttc  
gcgccgttctgccATTctggggcacttggaatgatatcgaactgtgacttgaactcggaactacacatcctatccaccctccgaaacttcacacctgcggtcaga

» 23S rRNA 1~2857 »

6,640 6,650 6,660 6,670 6,680 6,690 6,700 6,710 6,720 6,730 6,740

gcatggagccgaccttgaataaccaccctttaatgtttgatgttctaacttgaccgtaatccgggttgccgacagtgctctggtaggtttgactggggcggtc  
cgtacctcggctggaactttatggtaggaattacaaactacaagattgcaactgggcattaggcccaacgcctgtcacagaccacccatcaaactgaccccgccag

» 23S rRNA 1~2857 »

6,750 6,760 6,770 6,780 6,790 6,800 6,810 6,820 6,830 6,840

tcctcctaaagagtaacggaggagcacgaaggttggtctaatcctggtcggacatcaggaggttagtgcaatggcataagccagcttgactgcgagcgtgacggcgcg  
aggaggatttctcattgcctctcgtgtctccaaccgattaggaccagcctgtagtcctccaatcacgttacggtattcggtcgaactgacgctcgcactgccgcgc

» 23S rRNA 1~2857 »

6,850 6,860 6,870 6,880 6,890 6,900 6,910 6,920 6,930 6,940 6,950

agcaggtgcgaaagcaggtcatagtatccgggtggttctgaatggaagggccatcgctcaacggataaaagggtactccggggataacaggctgataccgcccaagag  
tcgtccacgctttcgtccagtatcactaggccaccaagacttacctcccggtagcgagttgcctattttccatgaggccccctattgtccgactatggcgggttctc

» 23S rRNA 1~2857 »

6,960 6,970 6,980 6,990 7,000 7,010 7,020 7,030 7,040 7,050 7,060

ttcatatcgacggcggtgtttggcacctcgatgtcggctcatcacatcctggggctgaagtaggtccaagggtatggctgttcgccatttaaagtggtagcgagc  
aagtatagctgccgccacaaacgtggagctacagccgagtagttaggacccgacttcatccagggttccataccgacaagcggtaaatttcaccatgcgctcg

» 23S rRNA 1~2857 »

7,070 7,080 7,090 7,100 7,110 7,120 7,130 7,140 7,150 7,160

tgggtttagaacgtcgtgagacagttcgggtccctatctgccgtgggctggagaactgagggggctgctcctagtagagaggaccggagtgacgcacactgg  
acccaatcttgcagcactctgtcaagccaggatagacggcaccccgacaccttctgactcccccgacaggatcatgctctcctggcctcacctgcgtagtacc

» 23S rRNA 1~2857 »

7,170 7,180 7,190 7,200 7,210 7,220 7,230 7,240 7,250 7,260 7,270

tgttcgggttgatccaatggcactgcccggtagctaaatgcggaagagataagtgtgaaagcatctaagcacgaaacttggcccgagatgagttctccctgac  
acaagcccaacagtacggttacgtgacgggcatcgatttacgccttctctattcagactttcgtagattcgtgcttgaacggggctctactcaagagggactg

» 23S rRNA 1~2857 »

7,280 7,290 7,300 7,310 7,320 7,330 7,340 7,350 7,360 7,370 7,380

cctttaagggtcctgaaggaacgttgaagacgacgacttgataggccgggtgtgtaagcgcagcgatgcgttgagctaaccggtactaatgaaccgtgaggcttaa  
ggaattcccagacttcccttgcaacttctgctgctgcaactatccggccacacattcgctgctacgcaactcgattggccatgattacttggcactccgaatt

» 23S rRNA 1~2857 » 23S rRNA 2858~2904 »

7,390 7,400 7,410 7,420 7,430 7,440 7,450 7,460 7,470 7,480 7,490

ccttacaacgccgaagctgttttggcggatgagagaagattttcagcctgatacagattaaatcagaacgcagaagcggctctgataaaacagaatttgcctggcggc  
ggaatgttgcggcttcgacaaaaccgcctactctcttctaaaagtcggactatgtctaatttagtcttgcgtcttcgccagactatttgtcttaaacggaccgccg

» 5S...A »

7,500 7,510 7,520 7,530 7,540 7,550 7,560 7,570 7,580 7,590

agtagcgcgggtggtccacctgaccccatgccgaactcagaagtgaacgcgtagcgccgatggtagtgtgggtctcccatgagagtagggaactgccaggc  
tcatcgccaccagggtgactgggttacggcttgagtcttcaatttgcggcatcgcggtaccatcacacccagagggtacgctctcatccttgacggtccg

» 5S rRNA »

7,600 7,610 7,620 7,630 7,640 7,650 7,660 7,670 7,680 7,690 7,700

atcaaataaagctgagttggctgtgccaccgctgagcaataactagcataaccccttggggcctctaaacgggtcttgaggggttttttgcgtgaaaggaggaacta  
tagttatttcgactcaaccgacgacggttgcgactcgattatgatcgatttgggaaccccgagatttggccagaactccccaaaaacgactttcctccttgat

» T7 terminator »

7,710 7,720 7,730 7,740 7,750 7,760 7,770 7,780 7,790 7,800 7,810

tatccgattggcgaatgggacgcgcctgtagcggcgcatgaagcgcggcgggtgtggtggttacgcgcagcgtgaccgtacacttgcagcgccttagcggc  
ataggcctaaccgcttaccctgcgcgggacatcgccgctaattcgcgccgccacaccaccaatgcgctcgcactggcgatgtgaacggtcgcgggatcgcgggc

» f1 ori »

7,820 7,830 7,840 7,850 7,860 7,870 7,880 7,890 7,900 7,910

ctcctttcgttttctcccttcttctcgcacgttcgcggctttcccgctcaagctctaaatcgggggctccctttagggttccgatttagtgctttacggcac  
gaggaaagcgaagaaaggaaggaagagcgggtgcaagcggccgaaagggcagttcagatttagccccgagggaatcccaaggctaaatcacgaaatgcggtg

» f1 ori »

7,920 7,930 7,940 7,950 7,960 7,970 7,980 7,990 8,000 8,010 8,020

ctcgaccccaaaaaacttgattagggatgaggttcacgtagtgggcatcgccctgatagacggtttttcgccctttgacgttggagtccacgttctttaatagtg  
gagctgggggtttttgaactaatcccactaccaagtgcacccggtagcgggactatctgccaaaagcgggaaactgcaacctcaggtgcaagaattatcacc

f1 ori

8,030 8,040 8,050 8,060 8,070 8,080 8,090 8,100 8,110 8,120 8,130

actcttgttccaaactggaacaacactcaaccctatctcggctctattcttttgatttataagggattttgccgatttcggcctatttggttaaaaaatgagctgattt  
tgagaacaagggttgacctgtgtgtgagttgggatagagccagataagaaaactaaatatccctaaaacggctaagccggataaccaatttttactcgactaaa

f1 ori

8,140 8,150 8,160 8,170 8,180 8,190 8,200 8,210 8,220 8,230

aacaaaaatttaacggaattttaacaaaatattaacgtttacaatttcaggtggcacttttcggggaaatgtgcgcggaaccctatttgtttatttttctaata  
ttgttttaaatgcgcttaaaattgttttataattgcaaatgttaaagtcaccggtgaaaagccctttacacgcgccttggggataacaaaataaaagatttat

f1 ori

8,240 8,250 8,260 8,270 8,280 8,290 8,300 8,310 8,320 8,330 8,340

cattcaaataatgtatccgctcatgaattaattcttagaaaaactcatcgagcatcaaataagaaactgcaatttattcatatcaggattatcaataccatattttgaa  
gtaagttatacataggcgagtacttaattaagaatcttttgagtagctcgtagtttactttgacgttaaaataagtatagtcctaatagttatggtataaaaactt

KanR

8,350 8,360 8,370 8,380 8,390 8,400 8,410 8,420 8,430 8,440 8,450

aaagccgtttctgtaataagaggagaaaactcaccgaggcagttccataggatggcaagatcctggatcggctctgcgattccgactcgtccaacatcaatacaacct  
tttcggcaaagacattacttctcttttgagtggctccgtcaaggtatcctaccgttctaggaccatagccagacgctaaggctgagcaggttgtagttatgttggga

KanR

8,460 8,470 8,480 8,490 8,500 8,510 8,520 8,530 8,540 8,550 8,560

attaatttccctcgtcaaaaaataaggttatcaagtgagaaatcacatgagtgcgactgaatccggtgagaatggcaaaagtttatgcatttctttccagacttg  
taattaaagggagcaggtttttattccaatagttcactcttttagtggtactcactgctgacttagccactcttaccgttttcaaatacgtaaagaaggtctgaac

KanR

8,570 8,580 8,590 8,600 8,610 8,620 8,630 8,640 8,650 8,660

ttcaacaggccagccattacgctcgtcatcaaaatcactcgcacatcaaccaaacggttattcattcgtgattgcgcctgagcgagacgaaatacgcatcgctgttaa  
aagttgtccggctcggtaatgcgagcagtagtttttagtgagcgtagttgggtttggcaataagtaagcactaacgcggactcgctctgctttatgcgctagcgacaatt

KanR

8,670 8,680 8,690 8,700 8,710 8,720 8,730 8,740 8,750 8,760 8,770

aaggacaattacaaacaggaatcgaatgcaaccggcgcaggaacactgccagcgcacatcaacaatatcttcacctgaatcaggatattcttctaataacctggaatgct  
ttcctgttaatgtttgtccttagcttacgttggccgcgtccttgtgacggtcgcgtagttgttataaaagtggacttagtcctataagaagattatggaccttacga

KanR

8,780 8,790 8,800 8,810 8,820 8,830 8,840 8,850 8,860 8,870 8,880

gttttccggggatcgagtggtgagtaaccatgcatcatcaggagtagcgataaaatgcttgatggcgcgaagaggcataaattccgtcagccagtttagtctgac  
caaaaggcccttagcgtagcaccactcattggtacgtagtagtcctcatgcctattttacgaactaccagccttctccgtatttaaggcagtcggtcaaatcagactg

«« KanR »»

8,890 8,900 8,910 8,920 8,930 8,940 8,950 8,960 8,970 8,980

catctcatctgtaacatcattggcaacgctacctttgccatgtttcagaacaactctggcgcatcgggcttccatacaatcgatagattgtcgacactgattgcc  
gtagagtagacattgtagtaacggttgcatggaacgggtacaaagtctttgttgagaccgctagcccgaagggtatgtagctatctaacagcgtggactaacgg

«« KanR »»

8,990 9,000 9,010 9,020 9,030 9,040 9,050 9,060 9,070 9,080 9,090

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«« KanR »»

9,100 9,110 9,120 9,130 9,140 9,150 9,160 9,170 9,180 9,190 9,200

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9,210 9,220 9,230 9,240 9,250 9,260 9,270 9,280 9,290 9,300

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ori »»

9,310 9,320 9,330 9,340 9,350 9,360 9,370 9,380 9,390 9,400 9,410

tttccgaaggtaactggcttcagcagagcgcagataccaaatactgtccttctagtgtagccgtagtttaggccaccacttcaagaactctgtagcaccgcctacata  
aaaggcttcattgaccgaagtcgtctcgctctatggtttatgacaggaagatcacatcggcacatcaatccggtggtgaagtctttagacatcgtggcggtat

»» ori »»

9,420 9,430 9,440 9,450 9,460 9,470 9,480 9,490 9,500 9,510 9,520

cctcgctctgctaactctgttaccagtggtgctgccagtgggcgataagtcgtgtcttaccgggttgactcaagacgatagttaccggataaggcgcagcggctcg  
ggagcgagacgattaggacaatggtcaccgacgacggtcaccgctattcagcacagaatggcccaacctgagttctgctatcaatggcctattccgctcgccagcc

»» ori »»

9,530 9,540 9,550 9,560 9,570 9,580 9,590 9,600 9,610 9,620 9,630

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»» ori »»

9,640 9,650 9,660 9,670 9,680 9,690 9,700 9,710 9,720 9,730

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»» ori »»

9,740 9,750 9,760 9,770 9,780 9,790 9,800 9,810 9,820 9,830 9,840

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ori

9,850 9,860 9,870 9,880 9,890 9,900 9,910 9,920 9,930 9,940 9,950

CTTTGCTCACATGTTCTTCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCGAACGACCGAGCGC  
GAAAACGAGTGTACAAGAAAGGACGCAATAGGGGACTAAGACACCTATTGGCATAATGGCGGAAACTCACTCGACTATGGCGAGCGGCGTCGGCTTGCTGGCTCGCG

9,960 9,970 9,980 9,990 10,000 10,010 10,020 10,030 10,040 10,050

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bom

10,060 10,070 10,080 10,090 10,100 10,110 10,120 10,130 10,140 10,150 10,160

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bom

10,170 10,180 10,190 10,200 10,210 10,220 10,230 10,240 10,250 10,260 10,270

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rop

10,280 10,290 10,300 10,310 10,320 10,330 10,340

## pT7\_WT-SD\_sfGFP (5735 bp)

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« rop »

10 20 30 40 50 60 70 80 90 100

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110 120 130 140 150 160 170 180 190 200 210

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220 230 240 250 260 270 280 290 300 310 320

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330 340 350 360 370 380 390 400 410 420

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430 440 450 460 470 480 490 500 510 520 530

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« lacI »

540 550 560 570 580 590 600 610 620 630 640

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tcgacgtaattacttagccggttgcgcgcccctctccgcaaacgcataaccgcggtccacacaaaagaaaagtgtcactctgcccttgtcgactaacgggaa

« lacI »

650 660 670 680 690 700 710 720 730 740

caccgcctggccctgagagagttgcagcaagcggtccacgtggtttgcccagcaggcgaaaatcctgtttgatgggtggttaacggcgggatataacatgagctgt  
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« lacI »

750 760 770 780 790 800 810 820 830 840 850

cttcggtatcgtcgtatccactaccgagatgtccgcaccaacgcgcagcccggactcggtaatggcgcgcatctgcgccagcgccatctgatcgttggcaaccagc  
gaagccatagcagcatagggtgatggctctacaggcgtggttgcgcgtcgggcctgagccattaccgcgcgtaacgcgggtcgcggttagactagcaaccgttggctg

« lacI »

860 870 880 890 900 910 920 930 940 950 960

atcgagtgaggaaacgatgccctcattcagcatttgcattggtttgttgaaaaccggacatggcactccagtcgccttcccgttccgctatcggtgaatttgattgcg  
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« lacI »

970 980 990 1,000 1,010 1,020 1,030 1,040 1,050 1,060 1,070

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« lacI »

1,080 1,090 1,100 1,110 1,120 1,130 1,140 1,150 1,160 1,170

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« lacI »

1,180 1,190 1,200 1,210 1,220 1,230 1,240 1,250 1,260 1,270 1,280

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« lacI »

1,290 1,300 1,310 1,320 1,330 1,340 1,350 1,360 1,370 1,380 1,390

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« lacI »

1,400 1,410 1,420 1,430 1,440 1,450 1,460 1,470 1,480 1,490

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« lacI »

1,500 1,510 1,520 1,530 1,540 1,550 1,560 1,570 1,580 1,590 1,600

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« lacI »

lacI promoter »

1,610 1,620 1,630 1,640 1,650 1,660 1,670 1,680 1,690 1,700 1,710

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« lacI promoter »

1,720 1,730 1,740 1,750 1,760 1,770 1,780 1,790 1,800 1,810

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1,820 1,830 1,840 1,850 1,860 1,870 1,880 1,890 1,900 1,910 1,920

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T7 promoter

lac operator

2,040 2,050 2,060 2,070 2,080 2,090 2,100 2,110 2,120 2,130 2,140

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2 4 6 8 10 12 14 16 18 20 22 24 26  
M S K G E E L F T G V V P I L V E L D G D V N G H K F  
2168-2884

RBS

superfolder GFP

2,150 2,160 2,170 2,180 2,190 2,200 2,210 2,220 2,230 2,240

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28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62  
S V R G E G E G D A T N G K L T L K F I C T O G K L P V P W P T L V T  
2168-2884

superfolder GFP

2,250 2,260 2,270 2,280 2,290 2,300 2,310 2,320 2,330 2,340 2,350

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64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98  
T L T Y G V Q C F S R Y P D H M K R H D F F K S A M P E G Y V Q E R T I  
2168-2884

superfolder GFP

2,360 2,370 2,380 2,390 2,400 2,410 2,420 2,430 2,440 2,450 2,460

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100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130 132 134  
S F K D D G T Y K T R A E V K F E G D T L V N R I E L K G I D F K E D G  
2168-2884

superfolder GFP

2,470 2,480 2,490 2,500 2,510 2,520 2,530 2,540 2,550 2,560

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136 138 140 142 144 146 148 150 152 154 156 158 160 162 164 166 168  
N I L G H K L E Y N F N S H N V Y I T A D K Q K N G I K A N F K I R H  
2168-2884

>> superfolder GFP >>  
2,570 2,580 2,590 2,600 2,610 2,620 2,630 2,640 2,650 2,660 2,670

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TGCAACTTCTACCTAGGCAAGTTGATCGTCTGGTAATAGTTGTTTTATGAGGTTAACCCTACCGGGACAGGAAAATGGTCTGTTGGAATGGACAGCTGTGTTAGA  
170 172 174 176 178 180 182 184 186 188 190 192 194 196 198 200 202 204  
N V E D G S V Q L A D H Y Q Q N T P I G D G P V L L P D N H Y L S T Q S  
2168-2884

>> superfolder GFP >>  
2,680 2,690 2,700 2,710 2,720 2,730 2,740 2,750 2,760 2,770 2,780

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206 208 210 212 214 216 218 220 222 224 226 228 230 232 234 236 238  
V L S K D P N E K R D H M V L L E F V T A A G I T H G M D E L Y K \*  
2168-2884

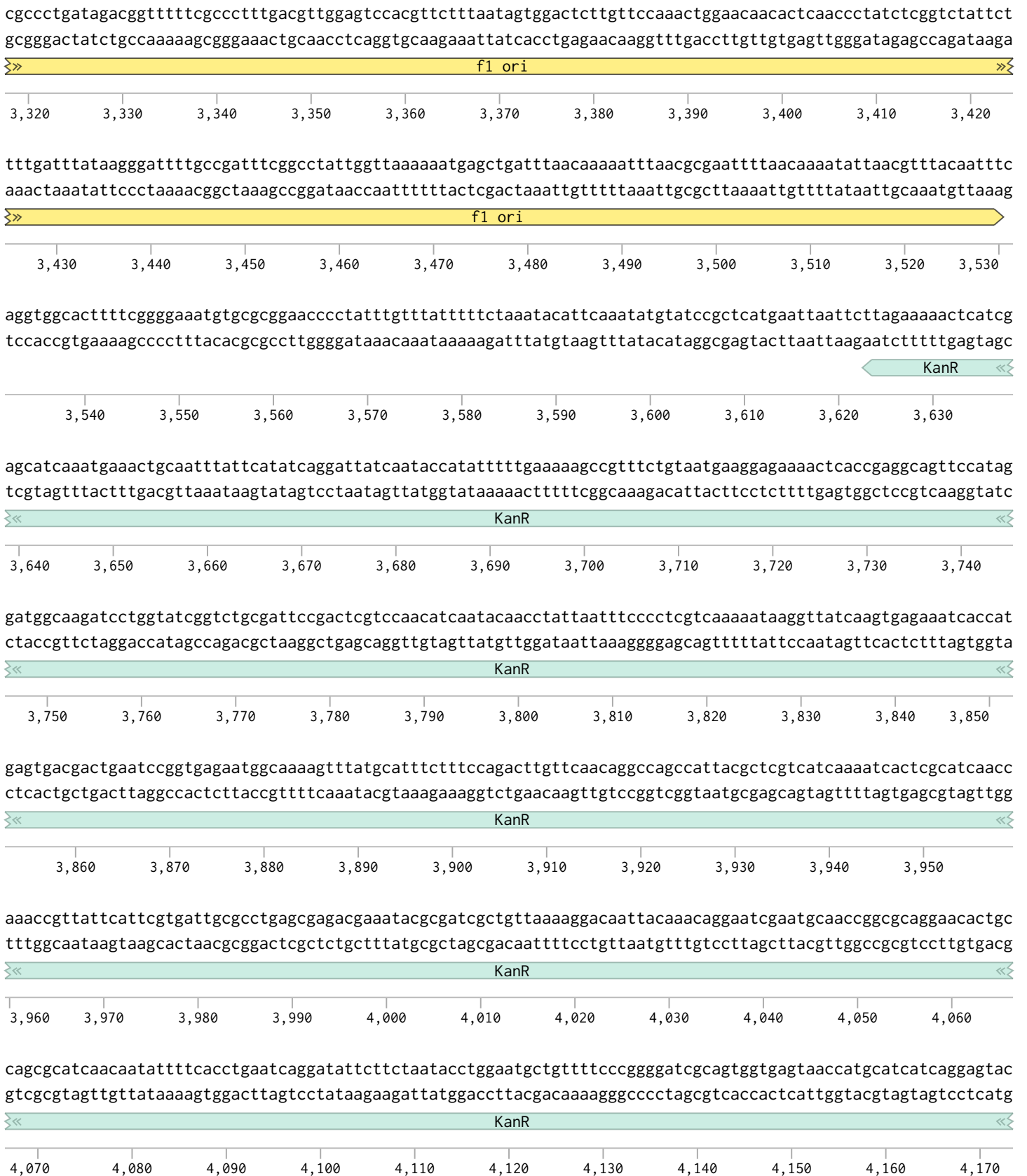
>> superfolder GFP >>  
2,790 2,800 2,810 2,820 2,830 2,840 2,850 2,860 2,870 2,880

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8xHis  
2,890 2,900 2,910 2,920 2,930 2,940 2,950 2,960 2,970 2,980 2,990

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T7 terminator f1 ori  
3,000 3,010 3,020 3,030 3,040 3,050 3,060 3,070 3,080 3,090 3,100

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3,110 3,120 3,130 3,140 3,150 3,160 3,170 3,180 3,190 3,200 3,210

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f1 ori  
3,220 3,230 3,240 3,250 3,260 3,270 3,280 3,290 3,300 3,310



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«« KanR »»

4,180 4,190 4,200 4,210 4,220 4,230 4,240 4,250 4,260 4,270 4,280

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«« KanR »»

4,290 4,300 4,310 4,320 4,330 4,340 4,350 4,360 4,370 4,380

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«« KanR »»

4,390 4,400 4,410 4,420 4,430 4,440 4,450 4,460 4,470 4,480 4,490

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ori »»

4,500 4,510 4,520 4,530 4,540 4,550 4,560 4,570 4,580 4,590 4,600

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»» ori »»

4,610 4,620 4,630 4,640 4,650 4,660 4,670 4,680 4,690 4,700

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»» ori »»

4,710 4,720 4,730 4,740 4,750 4,760 4,770 4,780 4,790 4,800 4,810

tcgtgtcttaccgggttgactcaagacgatagttaccggataaggcgacgggtcgggctgaacggggggttcgtgcacacagcccagcttgagcgaacgaccta agcacagaatggcccaacctgagttctgctatcaatggcctattccgcgtcgccagcccagcttgcccccaagcacgtgtgtcgggtcgaacctcgttgcgtggat

»» ori »»

4,820 4,830 4,840 4,850 4,860 4,870 4,880 4,890 4,900 4,910 4,920

caccgaactgagatacctacagcgtgagctatgagaaagcgccacgcttcccgaaggagaaaggcggacaggtatccggtgaagcggcaggggtcggaacaggagagc gtggcttgactctatggatgtcgcactcgatactctttcgcgtgcaagggttccctctttccgcctgtccataggccattcgccgtcccagccttgctcctctcg

»» ori »»

4,930 4,940 4,950 4,960 4,970 4,980 4,990 5,000 5,010 5,020

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ori

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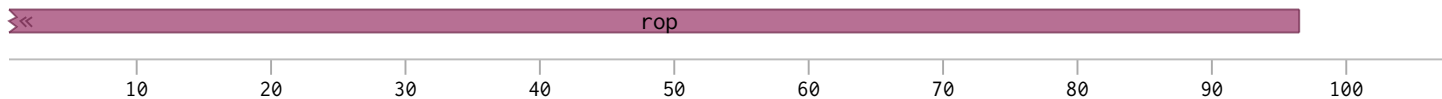
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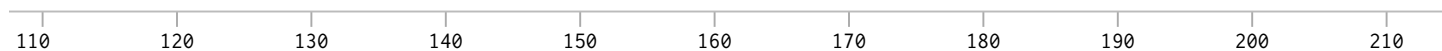
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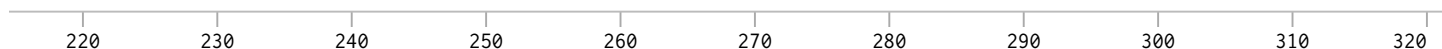
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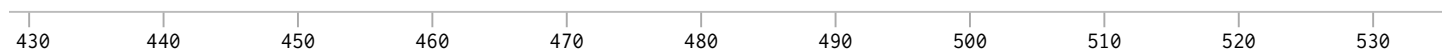
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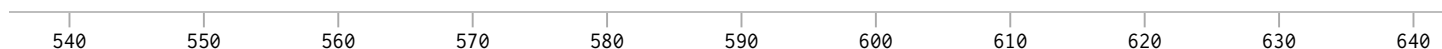
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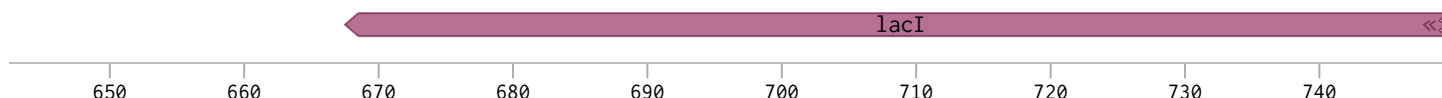
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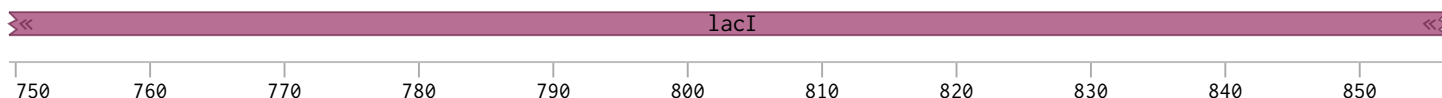
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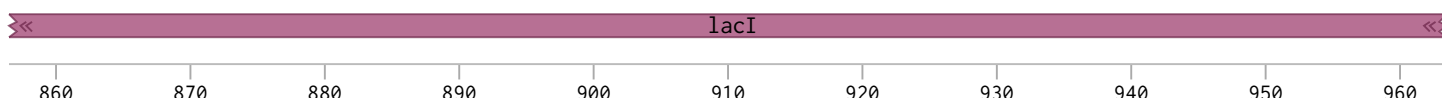
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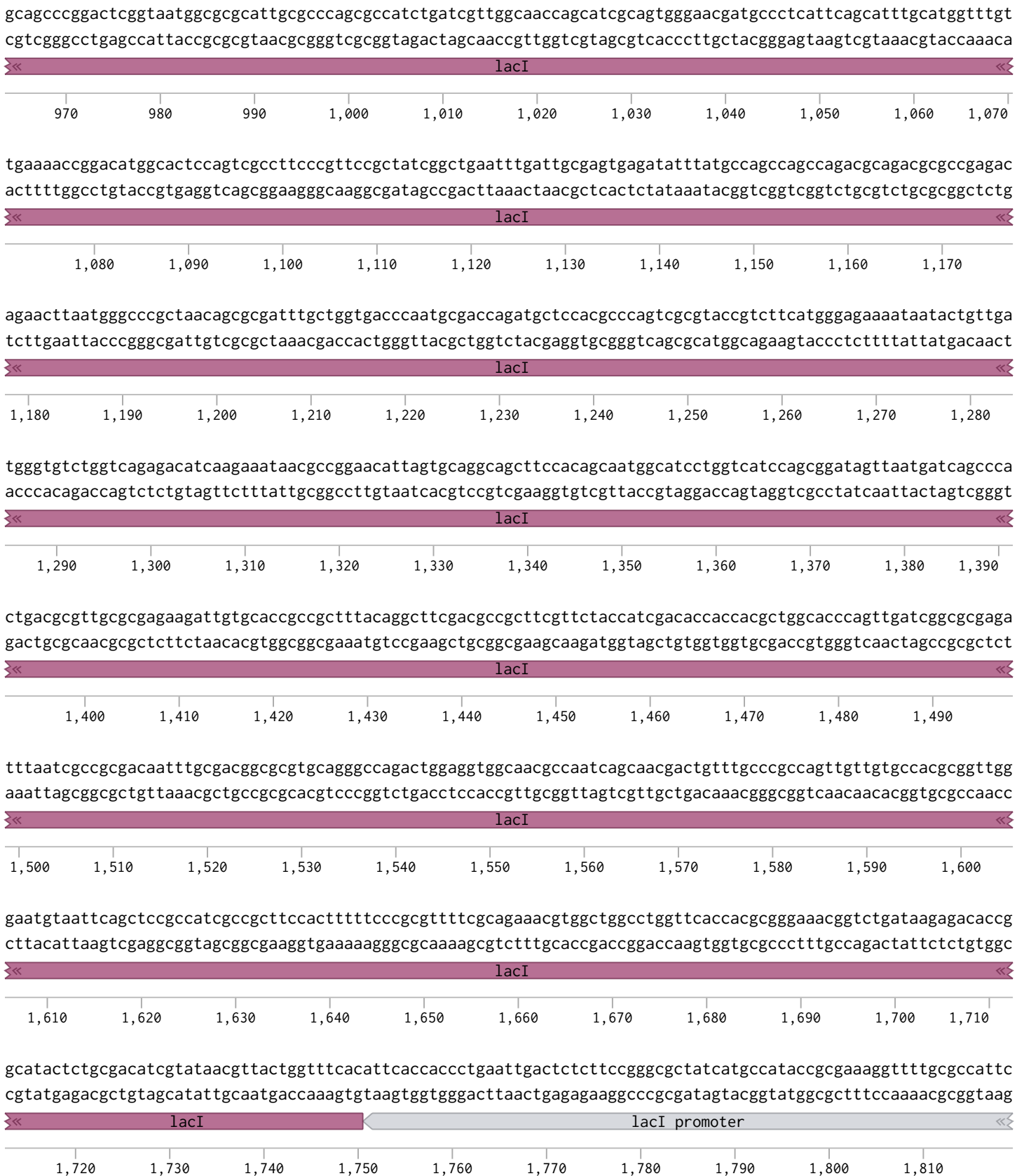


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M T M I T D  
2230-5304

T7 promoter lac operator RBS LacZ

2,150 2,160 2,170 2,180 2,190 2,200 2,210 2,220 2,230 2,240

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2230-5304

LacZ

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2230-5304

LacZ

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2230-5304

LacZ

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2230-5304

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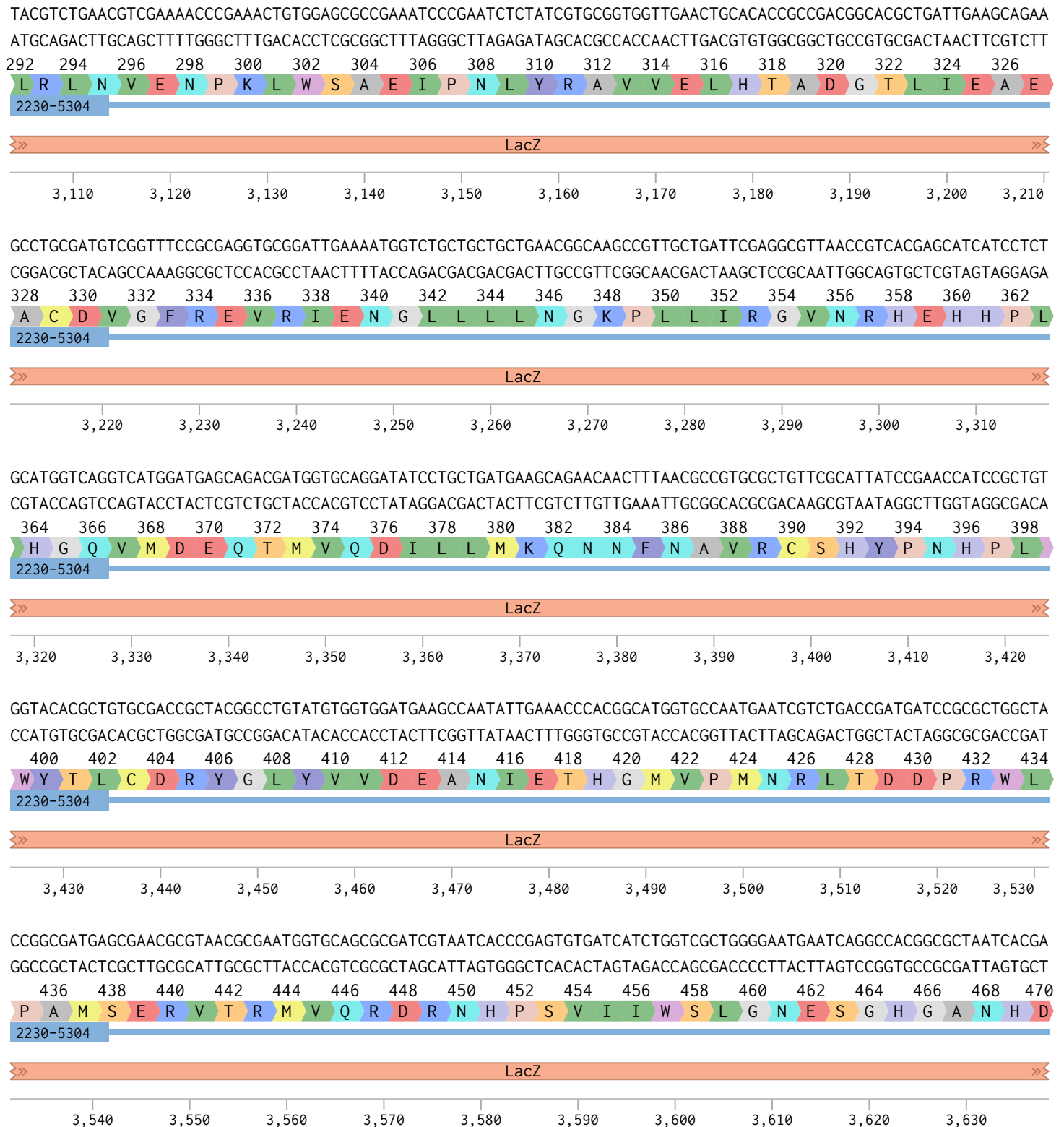
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>>> LacZ >>>

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>>> LacZ >>>

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578 580 582 584 586 588 590 592 594 596 598 600 602 604 606 608 610 612  
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D N E L L H W M V A L D G K P L A S G E V P L D V A P Q G K Q L I E L P  
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686 688 690 692 694 696 698 700 702 704 706 708 710 712 714 716 718  
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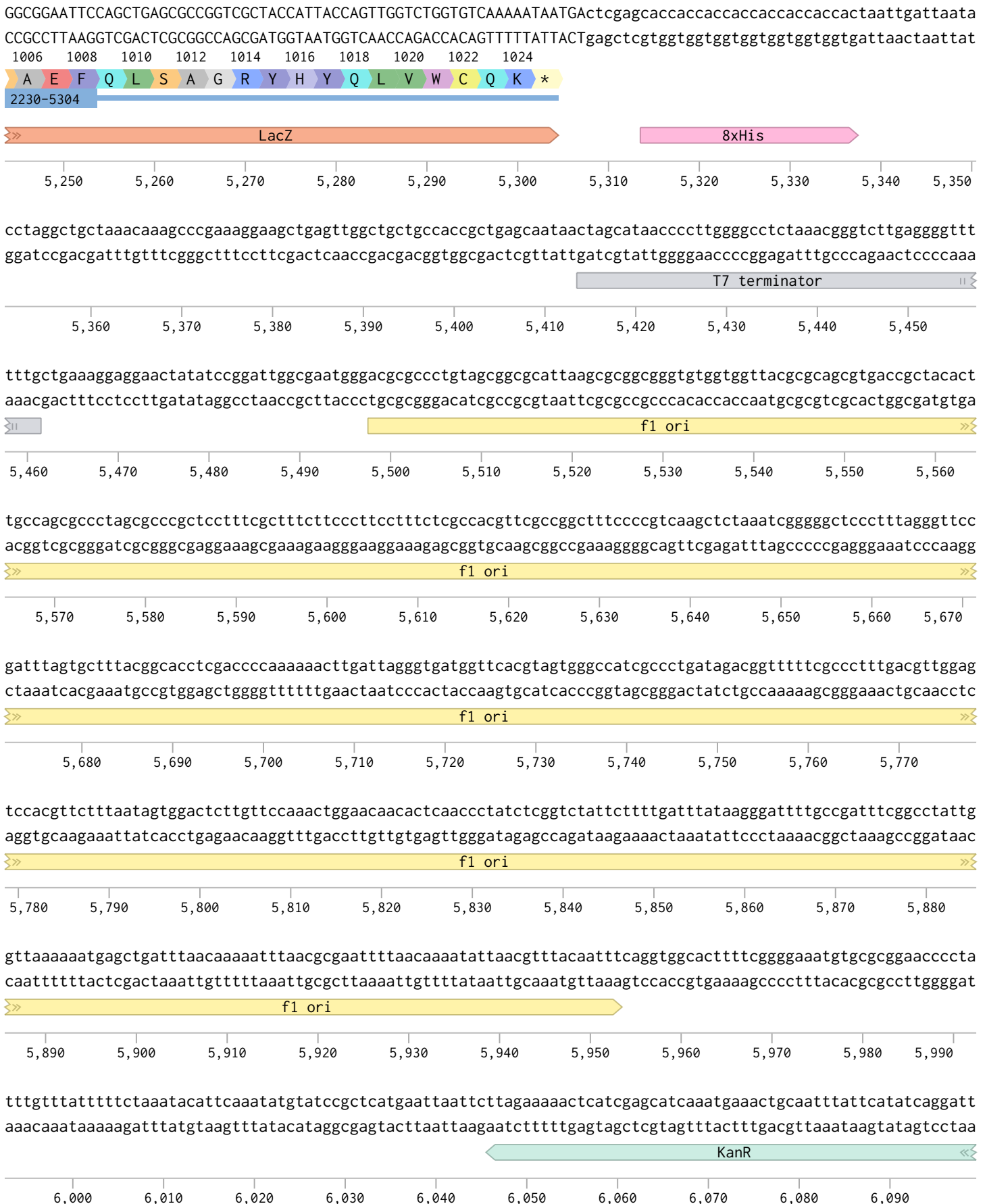
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2230-5304

>>> LacZ >>>  
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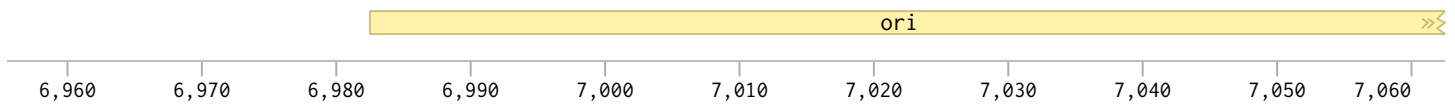
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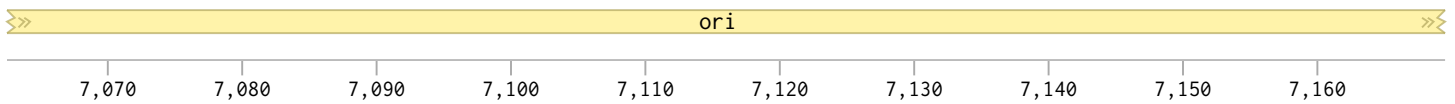
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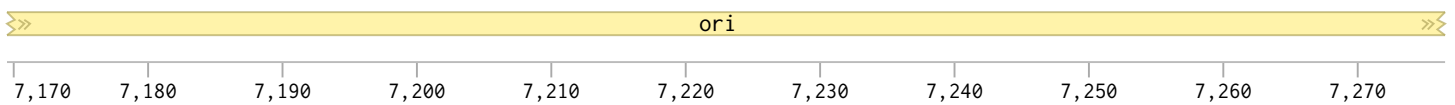
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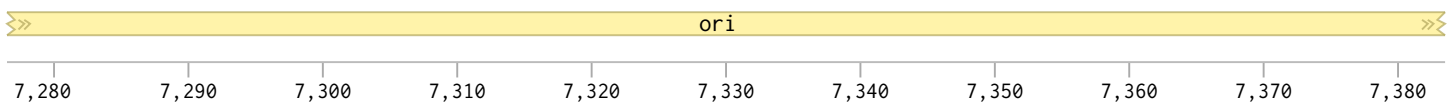
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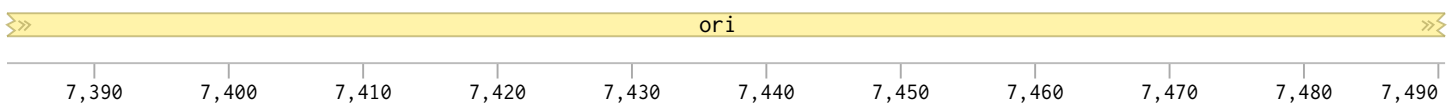
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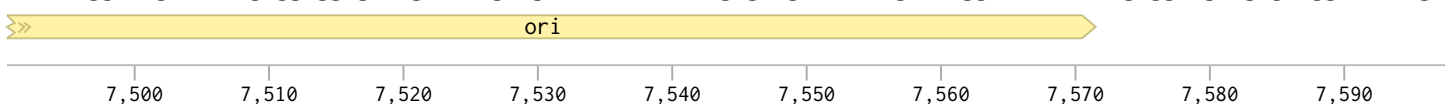
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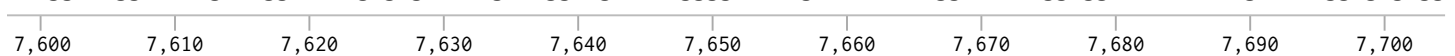
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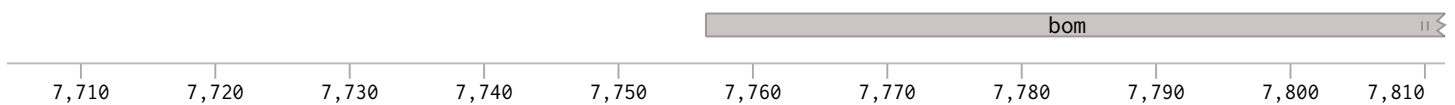
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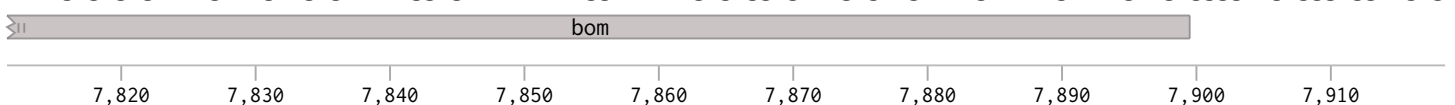
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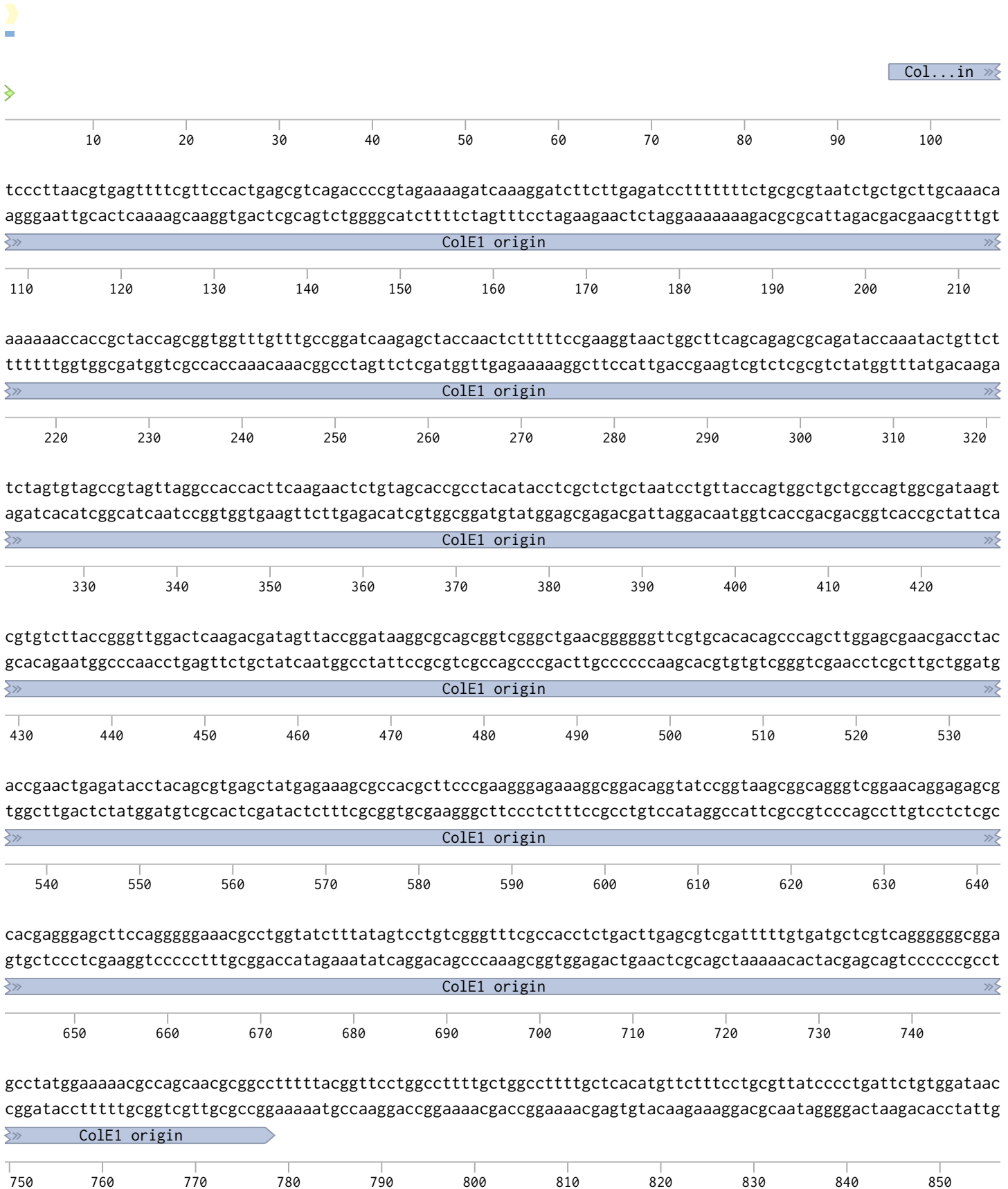
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1278-4352

lacZ

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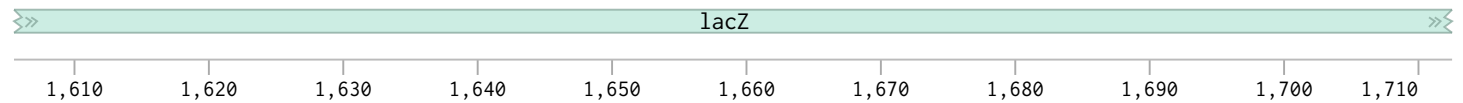
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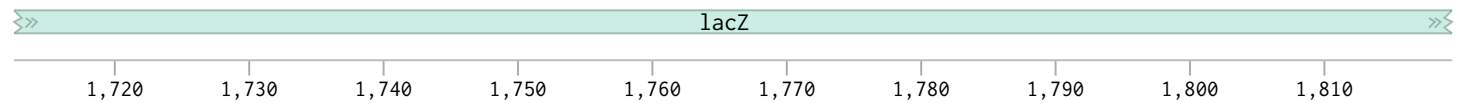
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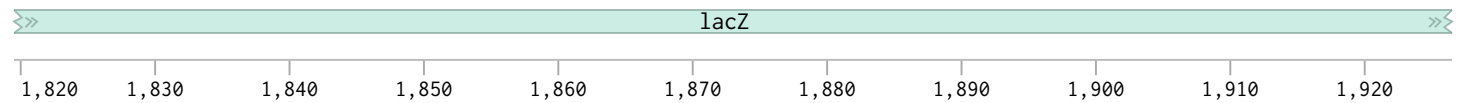
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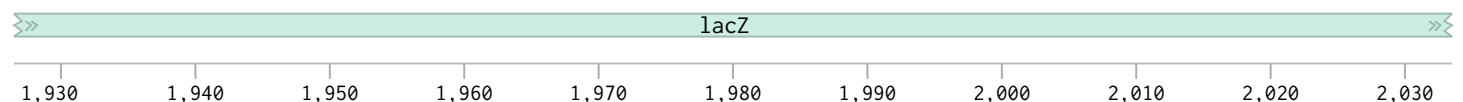
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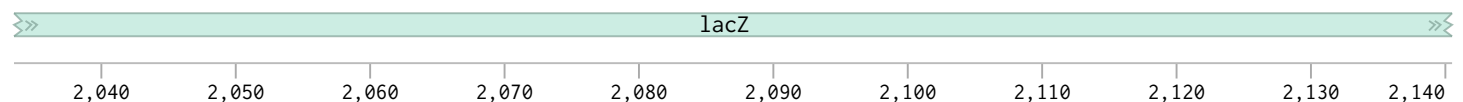
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»» lacZ »»

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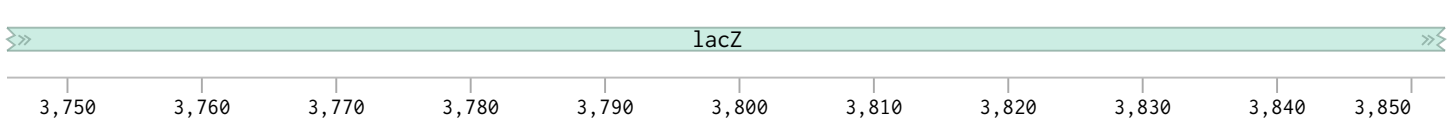
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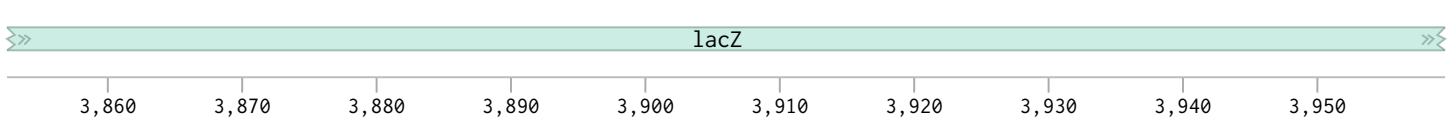
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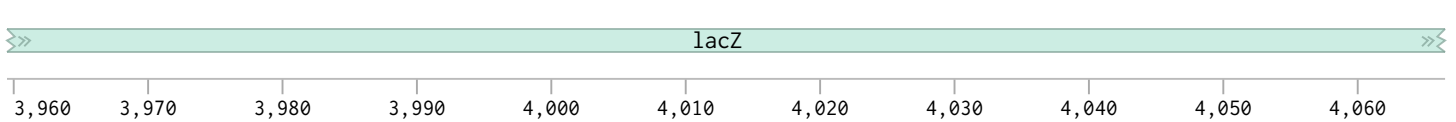
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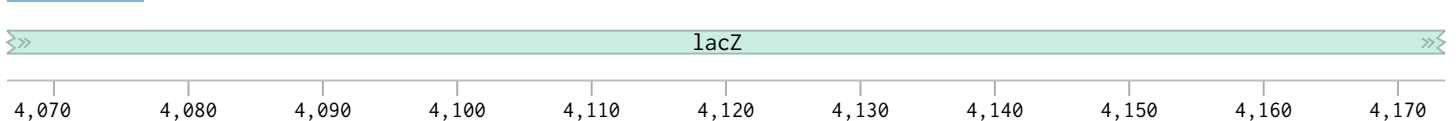
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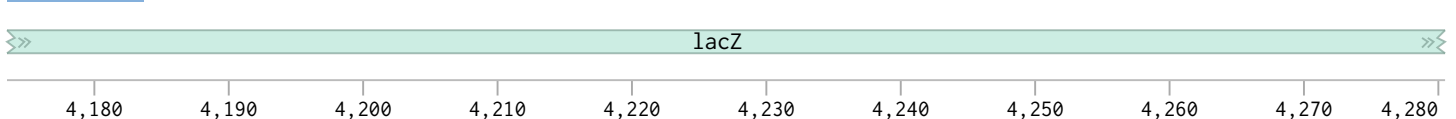
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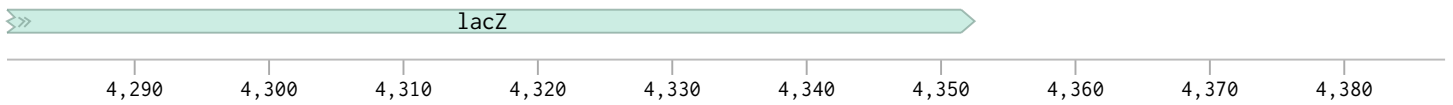
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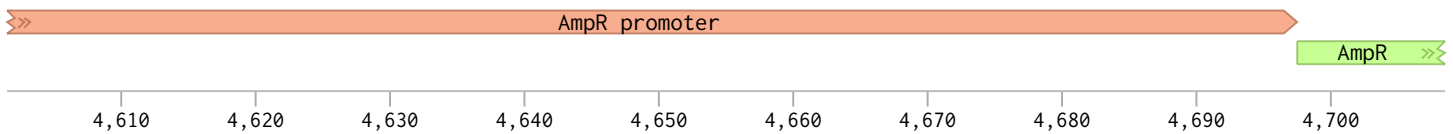
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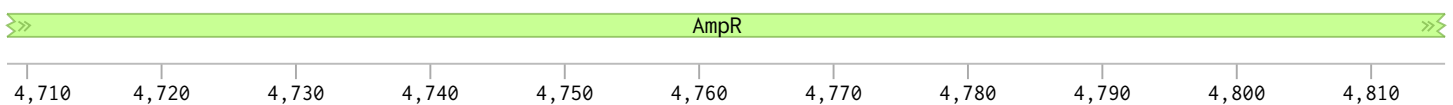
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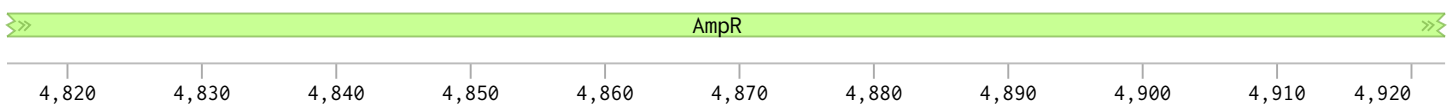
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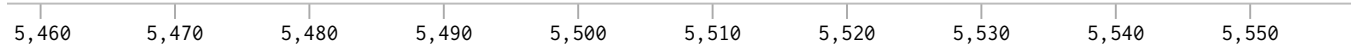
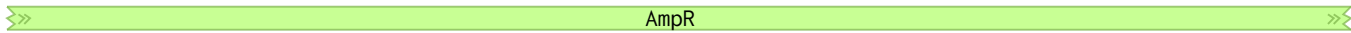
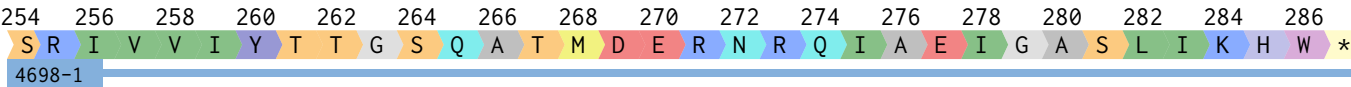
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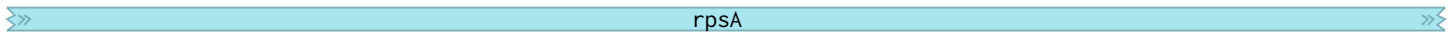
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» rpsA »

1,820 1,830 1,840 1,850 1,860 1,870 1,880 1,890 1,900 1,910 1,920

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» rpsA »

1,930 1,940 1,950 1,960 1,970 1,980 1,990 2,000 2,010 2,020 2,030

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2,040 2,050 2,060 2,070 2,080 2,090 2,100 2,110 2,120 2,130 2,140

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2,150 2,160 2,170 2,180 2,190 2,200 2,210 2,220 2,230 2,240

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AmpR promoter »

2,250 2,260 2,270 2,280 2,290 2,300 2,310 2,320 2,330 2,340 2,350

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AmpR »

2,360 2,370 2,380 2,390 2,400 2,410 2,420 2,430 2,440 2,450 2,460

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» AmpR »

2,470 2,480 2,490 2,500 2,510 2,520 2,530 2,540 2,550 2,560

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» AmpR »

2,570 2,580 2,590 2,600 2,610 2,620 2,630 2,640 2,650 2,660 2,670

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»» AmpR »»

2,680 2,690 2,700 2,710 2,720 2,730 2,740 2,750 2,760 2,770 2,780

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»» AmpR »»

2,790 2,800 2,810 2,820 2,830 2,840 2,850 2,860 2,870 2,880

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»» AmpR »»

2,890 2,900 2,910 2,920 2,930 2,940 2,950 2,960 2,970 2,980 2,990

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»» AmpR »»

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»» AmpR »»

3,110 3,120 3,130 3,140 3,150 3,160 3,170 3,180 3,190 3,200 3,210

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»» »»

3,220 3,230 3,240 3,250 3,260 3,270 3,280 3,290 3,300 3,310

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»» ColE1 origin »»

3,320 3,330 3,340 3,350 3,360 3,370 3,380 3,390 3,400 3,410 3,420

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»» ColE1 origin »»

3,430 3,440 3,450 3,460 3,470 3,480 3,490 3,500 3,510 3,520 3,530

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» ColE1 origin »

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» ColE1 origin »

3,640 3,650 3,660 3,670 3,680 3,690 3,700 3,710 3,720 3,730 3,740

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» ColE1 origin »

3,750 3,760 3,770 3,780 3,790 3,800 3,810 3,820 3,830 3,840 3,850

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» ColE1 origin »

3,860 3,870 3,880 3,890 3,900 3,910 3,920 3,930 3,940 3,950

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» ColE1 origin »

3,960 3,970 3,980 3,990 4,000 4,010 4,020 4,030 4,040 4,050 4,060

taaccgtattaccgcctttgagtgagctgataccgctcgccgacgccgaacgaccgagcgagcagtcagtgagcgaggaagcgggaaga  
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4,070 4,080 4,090 4,100 4,110 4,120 4,130 4,140 4,150