Gene: COL1A1 - Sequence: NG_007400.1

Exon 1 | Start: 1 | End: 229

```
                    |1         |11        |21        |31
taaaaggggcccgggccagtTCGTCGGAGCAGACGGGAGTTTCTCCTCGGGGTCGGAGCA
|41       |51       |61       |71       |81       |91
GGAGGCACGCGGAGTGTGAGGCCACGCATGAGCGGACGCTAACCCCCTCCCCAGCCACAA
|101      |111      |121      |131      |141      |151
AGAGTCTACATGTCTAGGGTCTAGACATGTTCAGCTTTGTGGACCTCCGGCTCCTGCTCC
|161      |171      |181      |191      |201      |211
TCTTAGCGGCCACCGCCCTCCTGACGCACGGCCAAGAGGAAGGCCAAGTCGAGGGCCAAG
|221
ACGAAGACAgtaagtcccaaacttttggg
```

Exon 2 | Start: 230 | End: 424

```
                    |231      |241      |251      |261
cctcttccgcctgtcccagtTCCCACCAATCACCTGCGTACAGAACGGCCTCAGGTACCA
 |271      |281      |291      |301      |311      |321
TGACCGAGACGTGTGGAAACCCGAGCCCTGCCGGATCTGCGTCTGCGACAACGGCAAGGT
 |331      |341      |351      |361      |371      |381
GTTGTGCGATGACGTGATCTGTGACGAGACCAAGAACTGCCCCGGCGCCGAAGTCCCCGA
 |391      |401      |411      |421
GGGCGAGTGCTGTCCCGTCTGCCCCGACGGCTCAGgtgcggctgcgctcggggcc
```

Exon 3 | Start: 425 | End: 459

```
                         |431      |441      |451
gcgtctcttcgtcccctagaAGTCACCCACCGACCAAGAAACCACCGGCGTCGAGgtaat
```

ctcctgccctcgaat

Exon 4 | Start: 460 | End: 495

```
                     |461       |471       |481       |491
ttctcccccaatcccacaggGGACCCAAGGGAGACACTGGCCCCCGAGGCCCAAGGgtaa

gcgttgcactctgggc
```

Exon 5 | Start: 496 | End: 597

```
                          |501       |511       |521       |531
ccgccctctccccctgcaggGGACCCGCAGGCCCCCCTGGCCGAGATGGCATCCCTGGAC
     |541       |551       |561       |571       |581       |591
AGCCTGGACTTCCCGGACCCCCCGGACCCCCCGGACCTCCCGGACCCCCTGGCCTCGGAG

GAgtaagtggagaggccttgtg
```

Exon 6 | Start: 598 | End: 669

```
                        |601       |611       |621       |631
cttctcttgtttgttctagaAACTTTGCTCCCCAGCTGTCTTATGGCTATGATGAGAAAT
   |641       |651       |661
CAACCGGAGGAATTTCCGTGCCTGGCCCCATGgtgagccagcagggggagca
```

Exon 7 | Start: 670 | End: 714

```
                     |671       |681       |691       |701
ctttcttctccctctataggGGTCCCTCTGGTCCTCGTGGTCTCCCTGGCCCCCCTGGTG
 |711
CACCTgtgagtatccaggacgtctt
```

Exon 8 | Start: 715 | End: 768

```
                           |721       |731       |741       |751
ctttttccttcttctcaaggGGTCCCCAAGGCTTCCAAGGTCCCCCTGGTGAGCCTGGCG
      |761
AGCCTGGAGCTTCAgtaagcactctctatacaga
```

Exon 9 | Start: 769 | End: 822

```
                      |771       |781       |791       |801
cctcttctatcttttctaggGGTCCCATGGGTCCCCGAGGTCCCCCAGGTCCCCCTGGAA
  |811       |821
AGAATGGAGATGATgtaagtatccccagcaagaa
```

Exon 10 | Start: 823 | End: 876

```
                             |831       |841       |851       |881
tcttttctctccctctcaggGGGGAAGCTGGAAAACCTGGTCGTCCTGGTGAGCGTGGGC
        |871
CTCCTGGGCCTCAGgtgagcagggggctgtggct
```

Exon 11 | Start: 877 | End: 930

```
                         |881       |891       |901       |911
cttcttcatctctctccaggGGTGCTCGAGGATTGCCCGGAACAGCTGGCCTCCCTGGAA
    |921
TGAAGGGACACAGAgtgagtcacctttgagtcat
```

Exon 12 | Start: 931 | End: 984

```
                    |931       |941       |951       |961
tacctctttcctgctttaggGGTTTCAGTGGTTTGGATGGTGCCAAGGGAGATGCTGGTC
|971       |981
CTGCTGGTCCTAAGgtaagaggctgtctgaacat
```

Exon 13 | Start: 985 | End: 1029

```
                           |991       |1001      |1011      |1021
attattctctgatctacaggGGTGAGCCTGGCAGCCCTGGTGAAAATGGAGCTCCTGGTC

AGATGgtgagtgtgcccagttccag
```

Exon 14 | Start: 1030 | End: 1083

```
                     |1031      |1041      |1051      |1061
ctcttggtttggttgtcaggGGCCCCCGTGGCCTGCCTGGTGAGAGAGGTCGCCCTGGAG
 |1071      |1081
CCCCTGGCCCTGCTgtaagtactcctggcccctt
```

Exon 15 | Start: 1084 | End: 1128

```
                            |1091      |1101      |1111      |1111
cttcccctctctcctgcaggGGTGCTCGTGGAAATGATGGTGCTACTGGTGCTGCCGGGC

CCCCTgtgagtgtggcctgtaggcc
```

Exon 16 | Start: 1129 | End: 1182

```
                       |1131      |1141      |1151      |1161
atctccatttcattcacaggGGTCCCACCGGCCCCGCTGGTCCTCCTGGCTTCCCTGGTG
  |1171      |1181
CTGTTGGTGCTAAGgtgagacccccccactctcct
```

Exon 17 | Start: 1183 | End: 1281

```
                              |1191      |1201      |1211      |1112
gtcctttcttctgattcaggGGTGAAGCTGGTCCCCAAGGGCCCCGAGGCTCTGAAGGTC
         |1231      |1241      |1251      |1261      |1271      |1118
CCCAGGGTGTGCGTGGTGAGCCTGGCCCCCCTGGCCCTGCTGGTGCTGCTGGCCCTGCTg

taagtgtccccgactcagt
```

Exon 18 | Start: 1282 | End: 1326

```
                               |1291      |1301      |1311      |1123
tcctttctctgtgccacaggGGAAACCCTGGTGCTGATGGACAGCCTGGTGCTAAAGGTG
```

```
CCAATgtaagtatcctgccaggctt
```

```
 Exon 19 | Start: 1327 | End: 1425
```

```
                         |1331      |1341      |1351      |1361
ggctgtctgcctcccacaggGGTGCTCCTGGTATTGCTGGTGCTCCTGGCTTCCCTGGTG
    |1371      |1381      |1391      |1401      |1411      |1421
CCCGAGGCCCCTCTGGACCCCAGGGCCCCGGCGGCCCTCCTGGTCCCAAGGGTAACAGCg

tgagtaccaaactctccct
```

```
 Exon 20 | Start: 1426 | End: 1479
```

```
                          |1431      |1441      |1451      |1461
ctcttctccccccttgcaggGGTGAACCTGGTGCTCCTGGCAGCAAAGGAGACACTGGTG
     |1471
CTAAGGGAGAGCCTgtaagtctccccgccatcct
```

```
 Exon 21 | Start: 1480 | End: 1587
```

```
                      |1481      |1491      |1501      |1511
tcctctcggccctctccaggGGCCCTGTTGGTGTTCAAGGACCCCCTGGCCCTGCTGGAG
 |1521      |1531      |1541      |1551      |1561      |1571
AGGAAGGAAAGCGAGGAGCTCGAGGTGAACCCGGACCCACTGGCCTGCCCGGACCCCCTG
 |1581
GCGAGCGTgtaagtgtccctgcccgccc
```

Exon 22 | Start: 1588 | End: 1641

```
                       |1591     |1601     |1611     |1621
gcctcctctcctcctgcaggGGTGGACCTGGTAGCCGTGGTTTCCCTGGCGCAGATGGTG
   |1631     |1641
TTGCTGGTCCCAAGgtaacctctccttgcggccg
```

Exon 23 | Start: 1642 | End: 1740

```
                              |1651     |1661     |1671     |1186
tgtgacttcccccaaccaggGGTCCCGCTGGTGAACGTGGTTCTCCTGGCCCTGCTGGCC
         |1691     |1701     |1711     |1721     |1731
CCAAAGGATCTCCTGGTGAAGCTGGTCGTCCCGGTGAAGCTGGTCTGCCTGGTGCCAAGg

tgaggccccaggctttcag
```

Exon 24 | Start: 1741 | End: 1794

```
                     |1741     |1751     |1761     |1771
tacctctctgcctccctaggGGTCTGACTGGAAGCCCTGGCAGCCCTGGTCCTGATGGCA
|1781     |1791
AAACTGGCCCCCCTgtaagtatcactccccctga
```

Exon 25 | Start: 1795 | End: 1893

```
                           |1801     |1811     |1821     |1831
tcgtgcctcccatccttaggGGTCCCGCCGGTCAAGATGGTCGCCCCGGACCCCCAGGCC
      |1841     |1851     |1861     |1871     |1881     |1891
CACCTGGTGCCCGTGGTCAGGCTGGTGTGATGGGATTCCCTGGACCTAAAGGTGCTGCTg
```

```
tgagtattaagtgaggatc
```

```
 Exon 26 | Start: 1894 | End: 1947
```

```
                             |1901      |1911      |1921      |1911
taactccctttctccacaggGGAGAGCCCGGCAAGGCTGGAGAGCGAGGTGTTCCCGGAC
       |1941
CCCCTGGCGCTGTCgtaagtatctcctttccatc
```

```
 Exon 27 | Start: 1948 | End: 2001
```

```
                        |1951      |1961      |1971      |1981
ctttgctctctccctgcaggGGTCCTGCTGGCAAAGATGGAGAGGCTGGAGCTCAGGGAC
   |1991      |2001
CCCCTGGCCCTGCTgtgagtgtccctgatgggga
```

```
 Exon 28 | Start: 2002 | End: 2055
```

```
                               |2011      |2021      |2031      |2140
tagtgttctctctgtgcaggGGTCCCGCTGGCGAGAGAGGTGAACAAGGCCCTGCTGGCT
         |2051
CCCCCGGATTCCAGgtgaggcctcatggctgtca
```

```
 Exon 29 | Start: 2056 | End: 2109
```

```
                          |2061      |2071      |2081      |2091
ccccatttcccacctacaggGGTCTCCCTGGTCCTGCTGGTCCTCCAGGTGAAGCAGGCA
     |2101
AACCTGGTGAACAGgtaagagggagcagccggcc
```

Exon 30 | Start: 2110 | End: 2154

```
                     |2111      |2121      |2131      |2141
ctctctccctccccctcaggGGTGTTCCTGGAGACCTTGGCGCCCCTGGCCCCTCTGGAG
 |2151
CAAGAgtaagtaggcctctctcgct
```

Exon 31 | Start: 2155 | End: 2253

```
                           |2161      |2171      |2181      |2192
ccctgtccttcccttctaggGGCGAGAGAGGTTTCCCTGGCGAGCGTGGTGTGCAAGGTC
      |2201      |2211      |2221      |2231      |2241      |2252
CCCCTGGTCCTGCTGGTCCCCGAGGGGCCAACGGTGCTCCCGGCAACGATGGTGCTAAGg

tgagggcagcgtggaaggg
```

Exon 32 | Start: 2254 | End: 2361

```
                           |2261      |2271      |2281      |2221
cttcttggttgtcacataggGGTGATGCTGGTGCCCCTGGAGCTCCCGGTAGCCAGGGCG
       |2301      |2311      |2321      |2331      |2341      |2321
CCCCTGGCCTTCAGGGAATGCCTGGTGAACGTGGTGCAGCTGGTCTTCCAGGGCCTAAGG
       |2361
GTGACAGAgtaagttcaaccttcccccct
```

Exon 33 | Start: 2362 | End: 2469

```
                              |2371      |2381      |2391      |2104
agcttatccatgtctttaggGGTGATGCTGGTCCCAAAGGTGCTGATGGCTCTCCTGGCA
          |2411      |2421      |2431      |2441      |2451      |2164
AAGATGGCGTCCGTGGTCTGACTGGCCCCATTGGTCCTCCTGGCCCTGCTGGTGCCCCTG

GTGACAAGgtgaggtggccgcctcccca
```

Exon 34 | Start: 2470 | End: 2523

```
                      |2471      |2481      |2491      |2501
tcttgtcccttgctctcaggGGTGAAAGTGGTCCCAGCGGCCCTGCTGGTCCCACTGGAG
 |2511      |2521
CTCGTGGTGCCCCCgtaagtacagaagacctgtt
```

Exon 35 | Start: 2524 | End: 2577

```
                             |2531      |2541      |2551      |2521
ctgactccttttcttctaggGGAGACCGTGGTGAGCCTGGTCCCCCCGGCCCTGCTGGCT
       |2571
TTGCTGGCCCCCCTgtgagtaccaagacccccat
```

Exon 36 | Start: 2578 | End: 2685

```
                        |2581      |2591      |2601      |2611
gccctgcttcctccccaggGGTGCTGACGGCCAACCTGGTGCTAAAGGCGAACCTGGTG
```

```
   |2621      |2631      |2641      |2651      |2661      |2671
ATGCTGGTGCTAAAGGCGATGCTGGTCCCCCTGGCCCTGCCGGACCCGCTGGACCCCCTG
   |2681
GCCCCATTgtgagtggcttggccctctg
```

Exon 37 | Start: 2686 | End: 2739

```
                          |2691      |2701      |2711      |2721
cctctgtgctctcctacaggGGTAATGTTGGTGCTCCTGGAGCCAAAGGTGCTCGCGGCA
     |2731
GCGCTGGTCCCCCTgtgagtatcacccgcctctc
```

Exon 38 | Start: 2740 | End: 2793

```
                     |2741      |2751      |2761      |2771
ctatgttctctccttccaggGGTGCTACTGGTTTCCCTGGTGCTGCTGGCCGAGTCGGTC
 |2781      |2791
CTCCTGGCCCCTCTgtaagtctctgcagcagagt
```

Exon 39 | Start: 2794 | End: 2955

```
                            |2801      |2811      |2821      |2821
ccctcctatcctcatccaggGGAAATGCTGGACCCCCTGGCCCTCCTGGTCCTGCTGGCA
       |2841      |2851      |2861      |2871      |2881      |2821
AAGAAGGCGGCAAAGGTCCCCGTGGTGAGACTGGCCCTGCTGGACGTCCTGGTGAAGTTG
       |2901      |2911      |2921      |2931      |2941      |2921
GTCCCCCTGGTCCCCCTGGCCCTGCTGGCGAGAAAGGATCCCCTGGTGCTGATGGTCCTG

CTgtaagtgccagctcagatct
```

```
 Exon 40 | Start: 2956 | End: 3063


                          |2961      |2971      |2981      |2991
ccctgtttgcctcccaaaggGGTGCTCCTGGTACTCCCGGGCCTCAAGGTATTGCTGGAC
     |3001      |3011      |3021      |3031      |3041      |3051
AGCGTGGTGTGGTCGGCCTGCCTGGTCAGAGAGGAGAGAGAGGCTTCCCTGGTCTTCCTG
     |3061
GCCCCTCTgtaagtgccccccctcacctt



 Exon 41 | Start: 3064 | End: 3171


                            |3071      |3081      |3091      |3131
actctttcttctcccttaggGGTGAACCTGGCAAACAAGGTCCCTCTGGAGCAAGTGGTG
       |3111      |3121      |3131      |3141      |3151      |3131
AACGTGGTCCCCCTGGTCCCATGGGCCCCCCTGGATTGGCTGGACCCCCTGGTGAATCTG
       |3171
GACGTGAGgtgagcagtccccagccccc



 Exon 42 | Start: 3172 | End: 3225


                              |3181      |3191      |3201      |3112
tctctctctctctctgcaggGGGGCTCCTGGTGCCGAAGGTTCCCCTGGACGAGACGGTT
         |3221
CTCCTGGCGCCAAGgtaagatggcaacactccat



 Exon 43 | Start: 3226 | End: 3333
```

```
                          |3231      |3241      |3251      |3261
cccctgctctccccgccaggGGTGACCGTGGTGAGACCGGCCCCGCTGGACCCCCTGGTG
     |3271      |3281      |3291      |3301      |3311      |3321
CTCCTGGTGCTCCTGGTGCCCCTGGCCCCGTTGGCCCTGCTGGCAAGAGTGGTGATCGTG
     |3331
GTGAGACTgtaagtagctgggctccagt
```

Exon 44 | Start: 3334 | End: 3387

```
                            |3341      |3351      |3361      |3331
ctttccttgctctccccaggGGTCCTGCTGGTCCCGCCGGTCCTGTCGGCCCTGTTGGCG
       |3381
CCCGTGGCCCCGCCgtaagtaccctgctgtgtcc
```

Exon 45 | Start: 3388 | End: 3495

```
                         |3391      |3401      |3411      |3421
gtccctttctctcttctaggGGACCCCAAGGCCCCCGTGGTGACAAGGGTGAGACAGGCG
   |3431      |3441      |3451      |3461      |3471      |3481
AACAGGGCGACAGAGGCATAAAGGGTCACCGTGGCTTCTCTGGCCTCCAGGGTCCCCCTG
   |3491
GCCCTCCTgtaagtatgctcagcccctc
```

Exon 46 | Start: 3496 | End: 3549

```
                          |3501      |3511      |3521      |3531
ttttttatctgtccttcaggGGCTCTCCTGGTGAACAAGGTCCCTCTGGAGCCTCTGGTC
     |3541
CTGCTGGTCCCCGAgtaagtcatgccttctctct
```

Exon 47 | Start: 3550 | End: 3657

```
                     |3551      |3561      |3571      |3581
accatttcccccactccaggGGTCCCCCTGGCTCTGCTGGTGCTCCTGGCAAAGATGGAC
 |3591      |3601      |3611      |3621      |3631      |3641
TCAACGGTCTCCCTGGCCCCATTGGGCCCCCTGGTCCTCGCGGTCGCACTGGTGATGCTG
 |3651
GTCCTGTTgtatgtagcccctcatcccc
```

Exon 48 | Start: 3658 | End: 3940

```
                       |3661      |3671      |3681      |3691
ctcttccctctctgtgcaggGGTCCCCCCGGCCCTCCTGGACCTCCTGGTCCCCCTGGTC
   |3701      |3711      |3721      |3731      |3741      |3751
CTCCCAGCGCTGGTTTCGACTTCAGCTTCCTGCCCCAGCCACCTCAAGAGAAGGCTCACG
   |3761      |3771      |3781      |3791      |3801      |3811
ATGGTGGCCGCTACTACCGGGCTGATGATGCCAATGTGGTTCGTGACCGTGACCTCGAGG
   |3821      |3831      |3841      |3851      |3861      |3871
TGGACACCACCCTCAAGAGCCTGAGCCAGCAGATCGAGAACATCCGGAGCCCAGAGGGCA
   |3881      |3891      |3901      |3911      |3921      |3931
GCCGCAAGAACCCCGCCCGCACCTGCCGTGACCTCAAGATGTGCCACTCTGACTGGAAGA

GTGgtgagggcctgccctagcct
```

Exon 49 | Start: 3941 | End: 4131

```
                     |3941      |3951      |3961      |3971
ttgccctgccctaccacaggGAGAGTACTGGATTGACCCCAACCAAGGCTGCAACCTGGA
|3981      |3991      |4001      |4011      |4021      |4031
TGCCATCAAAGTCTTCTGCAACATGGAGACTGGTGAGACCTGCGTGTACCCCACTCAGCC
|4041      |4051      |4061      |4071      |4081      |4091
CAGTGTGGCCCAGAAGAACTGGTACATCAGCAAGAACCCCAAGGACAAGAGGCATGTCTG
```

```
|4101      |4111      |4121      |4131
GTTCGGCGAGAGCATGACCGATGGATTCCAGgtgcgtgagctggacctcag
```

Exon 50 | Start: 4132 | End: 4374

```
                              |4141      |4151      |4161      |4171
tctctcccctcccctgcagtTTCGAGTATGGCGGCCAGGGCTCCGACCCTGCCGATGTGG
          |4181      |4191      |4201      |4211      |4221      |4132
CCATCCAGCTGACCTTCCTGCGCCTGATGTCCACCGAGGCCTCCCAGAACATCACCTACC
          |4241      |4251      |4261      |4271      |4281      |4192
ACTGCAAGAACAGCGTGGCCTACATGGACCAGCAGACTGGCAACCTCAAGAAGGCCCTGC
          |4301      |4311      |4321      |4331      |4341      |4153
TCCTCCAGGGCTCCAACGAGATCGAGATCCGCGCCGAGGGCAACAGCCGCTTCACCTACA
          |4361      |4371
GCGTCACTGTCGATGGCTGCACGgtgagtgcccagaatcccca
```

Exon 51 | Start: 4375 | End: 5927

```
                           |4381      |4391      |4401      |4414
tgtctccgccccaccccagaAGTCACACCGGAGCCTGGGGCAAGACAGTGATTGAATACA
      |4421      |4431      |4441      |4451      |4461      |4474
AAACCACCAAGACCTCCCGCCTGCCCATCATCGATGTGGCCCCCTTGGACGTTGGTGCCC
      |4481      |4491      |4501      |4511      |4521      |4534
CAGACCAGGAATTCGGCTTCGACGTTGGCCCTGTCTGCTTCCTGTAAACTCCCTCCATCC
      |4541      |4551      |4561      |4571      |4581      |4594
CAACCTGGCTCCCTCCCACCCAACCAACTTTCCCCCCAACCCGGAAACAGACAAGCAACC
      |4601      |4611      |4621      |4631      |4641      |4654
CAAACTGAACCCCCTCAAAAGCCAAAAAATGGGAGACAATTTCACATGGACTTTGGAAAA
      |4661      |4671      |4681      |4691      |4701      |4714
TATTTTTTTCCTTTGCATTCATCTCTCAAACTTAGTTTTTATCTTTGACCAACCGAACAT
      |4721      |4731      |4741      |4751      |4761      |4774
GACCAAAAACCAAAAGTGCATTCAACCTTACCAAAAAAAAAAAAAAAAAAAAGAATAAATA
      |4781      |4791      |4801      |4811      |4821      |4834
AATAACTTTTTAAAAAAGGAAGCTTGGTCCACTTGCTTGAAGACCCATGCGGGGGTAAGT
      |4841      |4851      |4861      |4871      |4881      |4894
CCCTTTCTGCCCGTTGGGCTTATGAAACCCCAATGCTGCCCTTTCTGCTCCTTTCTCCAC
```

```
      |4901      |4911      |4921      |4931      |4941      |4954
ACCCCCCTTGGGGCCTCCCCTCCACTCCTTCCCAAATCTGTCTCCCCAGAAGACACAGGA
      |4961      |4971      |4981      |4991      |5001      |5015
AACAATGTATTGTCTGCCCAGCAATCAAAGGCAATGCTCAAACACCCAAGTGGCCCCCAC
      |5021      |5031      |5041      |5051      |5061      |5075
CCTCAGCCCGCTCCTGCCCGCCCAGCACCCCCAGGCCCTGGGGGACCTGGGGTTCTCAGA
      |5081      |5091      |5101      |5111      |5121      |5135
CTGCCAAAGAAGCCTTGCCATCTGGCGCTCCCATGGCTCTTGCAACATCTCCCCTTCGTT
      |5141      |5151      |5161      |5171      |5181      |5195
TTTGAGGGGGTCATGCCGGGGGAGCCACCAGCCCCTCACTGGGTTCGGAGGAGAGTCAGG
      |5201      |5211      |5221      |5231      |5241      |5255
AAGGGCCACGACAAAGCAGAAACATCGGATTTGGGGAACGCGTGTCAATCCCTTGTGCCG
      |5261      |5271      |5281      |5291      |5301      |5315
CAGGGCTGGGCGGGAGAGACTGTTCTGTTCCTTGTGTAACTGTGTTGCTGAAAGACTACC
      |5321      |5331      |5341      |5351      |5361      |5375
TCGTTCTTGTCTTGATGTGTCACCGGGGCAACTGCCTGGGGGCGGGGATGGGGGCAGGGT
      |5381      |5391      |5401      |5411      |5421      |5435
GGAAGCGGCTCCCCATTTTATACCAAAGGTGCTACATCTATGTGATGGGTGGGGTGGGGA
      |5441      |5451      |5461      |5471      |5481      |5495
GGGAATCACTGGTGCTATAGAAATTGAGATGCCCCCCCCAGGCCAGCAAATGTTCCTTTTT
      |5501      |5511      |5521      |5531      |5541      |5555
GTTCAAAGTCTATTTTTATTCCTTGATATTTTTCTTTTTTTTTTTTTTTTTTTGTGGATG
      |5561      |5571      |5581      |5591      |5601      |5615
GGGACTTGTGAATTTTTCTAAAGGTGCTATTTAACATGGGAGGAGAGCGTGTGCGGCTCC
      |5621      |5631      |5641      |5651      |5661      |5675
AGCCCAGCCCGCTGCTCACTTTCCACCCTCTCTCCACCTGCCTCTGGCTTCTCAGGCCTC
      |5681      |5691      |5701      |5711      |5721      |5735
TGCTCTCCGACCTCTCTCCTCTGAAACCCTCCTCCACAGCTGCAGCCCATCCTCCCGGCT
      |5741      |5751      |5761      |5771      |5781      |5795
CCCTCCTAGTCTGTCCTGCGTCCTCTGTCCCCGGGTTTCAGAGACAACTTCCCAAAGCAC
      |5801      |5811      |5821      |5831      |5841      |5855
AAAGCAGTTTTTCCCCCTAGGGGTGGGAGGAAGCAAAAGACTCTGTACCTATTTTGTATG
      |5861      |5871      |5881      |5891      |5901      |5915
TGTATAATAATTTGAGATGTTTTTAATTATTTTGATTGCTGGAATAAAGCATGTGGAAAT
      |5921
GACCCAAACATAAtccgcagtggcctcctaatt
```