Gene: VHL - Sequence: NG_008212.3
Transcript: NM_000551.3 - Protein: NP_000542.1
Date : March 2, 2015

1^{st} line: Base numbering. Full stops for intronic +/- 5, 10, 15...
2^{nd} line: Base sequence. lower case Introns, upper case Exons
3^{rd} line: Amino acid sequence. Printed on FIRST base of codon
4^{th} line: Amino acid numbering. Numbered on 1^{st} and increments of 10

```
Exon 1 | Start: 5001 | End: 5553 | Length: 552

.    .    .    .    .    .    .    .    .    .    .    .
cacttgaacccaggagttcgagaccagcctaggcaacatagcgagactccgtttcaaaca

.    .    .    .    .    .    .    .    .    .    .    .
acaaataaaaataattagtcgggcatggtggtgcgcgcctacagtaccaactactcggga

.    .    .    .    .    .    .    .    .    .    .    .
ggctgaggcgagacgatcgcttgagccagggaggtcaaggctgcagtgagccaagctcgc

.    .    .    .    .    .    .    .    .    .    .    .
gccactgcactccagcccgggcgacagagtgagaccctgtctcaaaaaaaaaaaaaacac

.    .    .    .    .    .    .    .    .    .    .    .
caaaccttagaggggcgaaaaaaaatttatagtggaaatacagtaacgagttggcctag

    |-209     |-199     |-189     |-179     |-169     |-159
CCTCGCCTCCGTTACAACGGCCTACGGTGCTGGAGGATCCTTCTGCGCACGCGCACAGCC

    |-149     |-139     |-129     |-119     |-109     |-99
TCCGGCCGGCTATTTCCGCGAGCGCGTTCCATCCTCTACCGAGCGCGCGCGAAGACTACG

    |-89      |-79      |-69      |-59      |-49      |-39
GAGGTCGACTCGGGAGCGCGCACGCAGCTCCGCCCCGCGTCCGACCCGCGGATCCCGCGG

    |-29      |-19      |-9       |1        |11       |21
CGTCCGGCCCGGGTGGTCTGGATCGCGGAGGGAATGCCCCGGAGGGCGGAGAACTGGGAC
                                 M  P  R  R  A  E  N  W  D
                                 |1

   |31       |41       |51       |61       |71       |81
GAGGCCGAGGTAGGCGCGGAGGAGGCAGGCGTCGAAGAGTACGGCCCTGAAGAAGACGGC
E  A  E  V  G  A  E  E  A  G  V  E  E  Y  G  P  E  E  D  G
   |11                           |21
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   |91       |101      |111      |121      |131      |141
GGGGAGGAGTCGGGCGCCGAGGAGTCCGGCCCGGAAGAGTCCGGCCCGGAGGAACTGGGC
G  E  E  S  G  A  E  E  S  G  P  E  E  S  G  P  E  E  L  G
   |31                         |41

   |151      |161      |171      |181      |191      |201
GCCGAGGAGGAGATGGAGGCCGGGCGGCCGCGGCCCGTGCTGCGCTCGGTGAACTCGCGC
A  E  E  E  M  E  A  G  R  P  R  P  V  L  R  S  V  N  S  R
   |51                         |61

   |211      |221      |231      |241      |251      |261
GAGCCCTCCCAGGTCATCTTCTGCAATCGCAGTCCGCGCGTCGTGCTGCCCGTATGGCTC
E  P  S  Q  V  I  F  C  N  R  S  P  R  V  V  L  P  V  W  L
   |71                         |81

   |271      |281      |291      |301      |311      |321
AACTTCGACGGCGAGCCGCAGCCCTACCCAACGCTGCCGCCTGGCACGGGCCGCCGCATC
N  F  D  G  E  P  Q  P  Y  P  T  L  P  P  G  T  G  R  R  I
   |91                         |101

   |331          .   .   .   .   .   .   .   .   .
CACAGCTACCGAGgtacgggcccggcgcttaggcccgacccagcagggacgatagcacgg
H  S  Y  R  G
   |111

  .   .   .   .   .   .   .   .   .   .   .   .
tctgaagcccctctaccgccccggggtccattttgcagacggggaactgaggccccttga

  .   .   .   .   .   .   .   .   .   .   .   .
ggcaggacacatccagggtgacgctgctcgtaagcgtcagagcattctttttttttttttt

  .   .   .   .   .   .   .   .   .   .   .   .
ttttttttctgagacggagtctcgctctgtcgcccaggctggagtgcagtggcgcgatctc

  .   .   .   .   .   .   .   .   .   .   .   .
gactcactgcagcctccgcctcccgggttcaagcgattctcctgcctcagcctcctgagt

  .   .   .
agctgggattaca
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Exon 2 | Start: 9880 | End: 10002 | Length: 122

.    .    .    .    .    .    .    .    .    .    .    .
cccaggctggagtgcagtggcgcgatctcggctcacggcaagctccacctcctgggttca

.    .    .    .    .    .    .    .    .    .    .    .
caccattctcctgcctcagcctcccgagtagctgggactacaggcgctcgccaccacacc

.    .    .    .    .    .    .    .    .    .    .    .
tggctaatttttttgtatttttagtagagacgaggtttcaccacgttagccaggacggtc

.    .    .    .    .    .    .    .    .    .    .    .
ttgatctcctgacctcatgatccgcctgcctcggcctcccaaagtgctgggattacaggt

.    .    .    .    .    .    .    .    .    .    .    .
gtgggccaccgtgcccagccaccggtgtggctctttaacaacctttgcttgtcccgatag

|341      |351      |361      |371      |381      |391
GTCACCTTTGGCTCTTCAGAGATGCAGGGACACACGATGGGCTTCTGGTTAACCAAACTG
  H   L   W   L   F   R   D   A   G   T   H   D   G   L   L   V   N   Q   T   E
                    |121                                    |131

|401      |411      |421      |431      |441      |451
AATTATTTGTGCCATCTCTCAATGTTGACGGACAGCCTATTTTTGCCAATATCACACTGC
  L   F   V   P   S   L   N   V   D   G   Q   P   I   F   A   N   I   T   L   P
                    |141                                    |151

|461  .    .    .    .    .    .    .    .    .    .    .
CAGgtactgacgttttacttttttaaaaagataaggttgttgtggtaagtacaggatagac
  V

  .    .    .    .    .    .    .    .    .    .    .    .
cacttgaaaaattaagcccagttctcaatttttgcctgatgtcaggcacgttatccaatc

  .    .    .    .    .    .    .    .    .    .    .    .
tttttgtatcctattctctaccataaataaaatggaagtgatgtatttgtacgttatgtg

  .    .    .    .    .    .    .    .    .    .    .    .
ttaaaggtgttatggtgtctcaaaagcactttgggctcttaagagacaagcgaaattaaa

  .    .    .    .    .    .    .    .    .    .    .    .
gtatcatatcataggttagttttgtagaattgtagaattacgaatgccttttgtttccct

  .
ggc
```

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Exon 3 | Start: 13153 | End: 17036 | Length: 3883

.   .   .   .   .   .   .   .   .   .   .   .
gcaggccttttaaggcttcggcctagaattgccagtgtcgcttcatccacattcagtta

.   .   .   .   .   .   .   .   .   .   .   .
gttaaagcaatcacaagcccagcccatttcaaggtgaaattactacagaggcatgaacac

.   .   .   .   .   .   .   .   .   .   .   .
catgaggtgtccataggggccatcagcataacacactgccacatacatgcactcacttt

.   .   .   .   .   .   .   .   .   .   .   .
ttttctttaacctaaagtgagatccatcagtagtacaggtagttgttggcaaagcctctt

.   .   .   .   .   .   .   .   .   .   .   .
gttcgttccttgtactgagaccctagtctgccactgaggatttggtttttgcccttccag

      |471      |481      |491      |501      |511      |521
TGTATACTCTGAAAGAGCGATGCCTCCAGGTTGTCCGGAGCCTAGTCAAGCCTGAGAATT
  Y   T   L   K   E   R   C   L   Q   V   V   R   S   L   V   K   P   E   N   Y
                |161                              |171

      |531      |541      |551      |561      |571      |581
ACAGGAGACTGGACATCGTCAGGTCGCTCTACGAAGATCTGGAAGACCACCCAAATGTGC
  R   R   L   D   I   V   R   S   L   Y   E   D   L   E   D   H   P   N   V   Q
                |181                              |191

      |591      |601      |611      |621      |631      |641
AGAAAGACCTGGAGCGGCTGACACAGGAGCGCATTGCACATCAACGGATGGGAGATTGAA
  K   D   L   E   R   L   T   Q   E   R   I   A   H   Q   R   M   G   D   *
                |201                              |211

        |*11      |*21      |*31      |*41      |*51      |*61
GATTTCTGTTGAAACTTACACTGTTTCATCTCAGCTTTTGATGGTACTGATGAGTCTTGA

        |*71      |*81      |*91      |*101     |*111     |*121
TCTAGATACAGGACTGGTTCCTTCCTTAGTTTCAAAGTGTCTCATTCTCAGAGTAAAATA

        |*131     |*141     |*151     |*161     |*171     |*181
GGCACCATTGCTTAAAAGAAAGTTAACTGACTTCACTAGGCATTGTGATGTTTAGGGGCA

        |*191     |*201     |*211     |*221     |*231     |*241
AACATCACAAAATGTAATTTAATGCCTGCCCATTAGAGAAGTATTTATCAGGAGAAGGTG
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         |*251     |*261     |*271     |*281     |*291     |*301
GTGGCATTTTTGCTTCCTAGTAAGTCAGGACAGCTTGTATGTAAGGAGGTTTGTATAAGT

         |*311     |*321     |*331     |*341     |*351     |*361
AATTCAGTGGGAATTGCAGCATATCGTTTAATTTTAAGAAGGCATTGGCATCTGCTTTTA

         |*371     |*381     |*391     |*401     |*411     |*421
ATGGATGTATAATACATCCATTCTACATCCGTAGCGGTTGGTGACTTGTCTGCCTCCTGC

         |*431     |*441     |*451     |*461     |*471     |*481
TTTGGGAAGACTGAGGCATCCGTGAGGCAGGGACAAGTCTTTCTCCTCTTTGAGACCCCA

         |*491     |*501     |*511     |*521     |*531     |*541
GTGCCTGCACATCATGAGCCTTCAGTCAGGGTTTGTCAGAGGAACAAACCAGGGGACACT

         |*551     |*561     |*571     |*581     |*591     |*601
TTGTTAGAAAGTGCTTAGAGGTTCTGCCTCTATTTTTGTTGGGGGGTGGGAGAGGGGACC

         |*611     |*621     |*631     |*641     |*651     |*661
TTAAAATGTGTACAGTGAACAAATGTCTTAAAGGGAATCATTTTTGTAGGAAGCATTTTT

         |*671     |*681     |*691     |*701     |*711     |*721
TATAATTTTCTAAGTCGTGCACTTTCTCGGTCCACTCTTGTTGAAGTGCTGTTTTATTAC

         |*731     |*741     |*751     |*761     |*771     |*781
TGTTTCTAAACTAGGATTGACATTCTACAGTTGTGATAATAGCATTTTTGTAACTTGCCA

         |*791     |*801     |*811     |*821     |*831     |*841
TCCGCACAGAAAATACGAGAAAATCTGCATGTTTGATTATAGTATTAATGGACAAATAAG

         |*851     |*861     |*871     |*881     |*891     |*901
TTTTTGCTAAATGTGAGTATTTCTGTTCCTTTTTGTAAATATGTGACATTCCTGATTGAT

         |*911     |*921     |*931     |*941     |*951     |*961
TTGGGTTTTTTTGTTGTTGTTGTTTTGTTTTGTTTTGTTTTTTTTGAGATGGAGTCTCACT

         |*971     |*981     |*991     |*1001    |*1011    |*1021
CTTGTCACCCAGGCTGGAGTGCAGTGGCGCCATCTCGGCTCACTGCAACCTCTGCCTCCT

         |*1031    |*1041    |*1051    |*1061    |*1071    |*1081
GGGTTCACGTAATCCTCCTGAGTAGCTGGGATTACAGGCGCCTGCCACCACGCTGGCCAA

         |*1091    |*1101    |*1111    |*1121    |*1131    |*1141
TTTTTGTACTTTTAGTAGAGACAGTGTTTCGCCATGTTGGCCAGGCTGGTTTCAAACTCC
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         |*1151    |*1161    |*1171    |*1181    |*1191    |*1201
TGACCTCAGGTGATCCGCCCACCTCAGCCTCCCAAAATGGTGGGATTACAGGTGTGTGGG

         |*1211    |*1221    |*1231    |*1241    |*1251    |*1261
CCACCGTGCCTGGCTGATTCAGCATTTTTTATCAGGCAGGACCAGGTGGCACTTCCACCT

         |*1271    |*1281    |*1291    |*1301    |*1311    |*1321
CCAGCCTCTGGTCCTACCAATGGATTCATGGAGTAGCCTGGACTGTTTCATAGTTTTCTA

         |*1331    |*1341    |*1351    |*1361    |*1371    |*1381
AATGTACAAATTCTTATAGGCTAGACTTAGATTCATTAACTCAAATTCAATGCTTCTATC

         |*1391    |*1401    |*1411    |*1421    |*1431    |*1441
AGACTCAGTTTTTTGTAACTAATAGATTTTTTTTTCCACTTTTGTTCTACTCCTTCCCTA

         |*1451    |*1461    |*1471    |*1481    |*1491    |*1501
ATAGCTTTTTAAAAAAATCTCCCCAGTAGAGAAACATTTGGAAAAGACAGAAAACTAAAA

         |*1511    |*1521    |*1531    |*1541    |*1551    |*1561
AGGAAGAAAAAAGATCCCTATTAGATACACTTCTTAAATACAATCACATTAACATTTTGA

         |*1571    |*1581    |*1591    |*1601    |*1611    |*1621
GCTATTTCCTTCCAGCCTTTTTAGGGCAGATTTTGGTTGGTTTTTACATAGTTGAGATTG

         |*1631    |*1641    |*1651    |*1661    |*1671    |*1681
TACTGTTCATACAGTTTTATACCCTTTTTCATTTAACTTTATAACTTAAATATTGCTCTA

         |*1691    |*1701    |*1711    |*1721    |*1731    |*1741
TGTTAGTATAAGCTTTTCACAAACATTAGTATAGTCTCCCTTTTATAATTAATGTTTGTG

         |*1751    |*1761    |*1771    |*1781    |*1791    |*1801
GGTATTTCTTGGCATGCATCTTTAATTCCTTATCCTAGCCTTTGGGCACAATTCCTGTGC

         |*1811    |*1821    |*1831    |*1841    |*1851    |*1861
TCAAAAATGAGAGTGACGGCTGGCATGGTGGCTCCCGCCTGTAATCCCAGTACTTTGGAA

         |*1871    |*1881    |*1891    |*1901    |*1911    |*1921
AGCCAAGGTAAGAGGATTGCTTGAGCCCAGAACTTCAAGATGAGCCTGGGCTCATAGTGA

         |*1931    |*1941    |*1951    |*1961    |*1971    |*1981
GAACCCATCTATACAAAAAATTTTTAAAAATTAGCATGGCGGCACACATCTGTAATCCTA

         |*1991    |*2001    |*2011    |*2021    |*2031    |*2041
GCTACTTGGCAGGCTGAGGTGAGAAGATCATTGGAGTTTAGGAATTGGAGGCTGCAGTGA
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         |*2051    |*2061    |*2071    |*2081    |*2091    |*2101
GCCATGAGTATGCCACTGCACTCCAGCCTGGGGGACAGAGCAAGACCCTGCCTCAAAAAA

         |*2111    |*2121    |*2131    |*2141    |*2151    |*2161
AAAAAAAAAAAAAAAAATCAGGCCGGGCATGGTGGCTCACGCCTGTAATCCCAGCACTTTG

         |*2171    |*2181    |*2191    |*2201    |*2211    |*2221
GGAGGTCGAGGTGGGCAGATCACCTGAGGTCAGGAGTTCGAGACCAGCCTGGCCAACATG

         |*2231    |*2241    |*2251    |*2261    |*2271    |*2281
GTAAAACCCCATTTCTACTAAAAAATACAAGAATTAGCTGGGTGTGGTGGCGCATGCCTG

         |*2291    |*2301    |*2311    |*2321    |*2331    |*2341
TAATCCTAGCTACTCAGGAGGCTGAGGCAGGAGAATCACTTGAACCCAGGAGGCGAAGAT

         |*2351    |*2361    |*2371    |*2381    |*2391    |*2401
TGCAGTGAGCTGATATCGCACCATTGTACTCCAGCCTGTGTGACAGAGCAATACTCTTGT

         |*2411    |*2421    |*2431    |*2441    |*2451    |*2461
CTCAAAAAAAAAAAAAAATTCAAATCAGAGTGAAGTGAATGAGACACTCCAGTTTTCCTT

         |*2471    |*2481    |*2491    |*2501    |*2511    |*2521
CTACTCCGAATTTCAACTGATTTTAGCTCCTCCTTTCAACATTCAACAAATAGTCTTTTT

         |*2531    |*2541    |*2551    |*2561    |*2571    |*2581
TTTTTTTTTTTTTTTTTTTTTTTTGAGATGGAGTCTCACTCTGTTGCCCAGGCTGGAGTG

         |*2591    |*2601    |*2611    |*2621    |*2631    |*2641
CAGTGGTGCGATCTCTGCTCACTACAAGCTCTGCCTCCCGAGTTCAAGTGATTCTCCTGG

         |*2651    |*2661    |*2671    |*2681    |*2691    |*2701
CTCACCCTCCTGAGTAGCTGGGATTACAGGCGCCTGCCACCATGCCTGGCTAATTTTGTG

         |*2711    |*2721    |*2731    |*2741    |*2751    |*2761
TTTTTAGTGGAGACGGGGTTTCACCATGTTGTCCAGGATGGTCTTGATCTCCTGACCTTG

         |*2771    |*2781    |*2791    |*2801    |*2811    |*2821
TGATCCACCCACCTCAGCCTCCCAAAGTGCTGGGATTACAGGTGTGAGCCACCGCGTCCA

         |*2831    |*2841    |*2851    |*2861    |*2871    |*2881
GCCAGCTTTATTATTTTTTTTAAGCTGTCTTTGTGTCAAAATGATAGTTCATGCTCCTCT

         |*2891    |*2901    |*2911    |*2921    |*2931    |*2941
TGTTAAAACCTGCAGGCCGAGCACAGTGGCTCATGCCTGTAATCCCAGCATTTTGGGAGA
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         |*2951    |*2961    |*2971    |*2981    |*2991    |*3001
CCAAGGCGGATGGATCACCTGAGGTCAGGAGCTGAAGACCAGCCTGGCTAACATGGTGAA

         |*3011    |*3021    |*3031    |*3041    |*3051    |*3061
ACCTCATCTCCACTTAAAATACAAAAATTGCCGGCCGCGGCGGCTCATGCCTGTAATCCC

         |*3071    |*3081    |*3091    |*3101    |*3111    |*3121
AGCACTTTGGGAGGCCTAGGCGGGTGGATCACGAGGTCAGGAAATCGAGACCATCCTGGC

         |*3131    |*3141    |*3151    |*3161    |*3171    |*3181
TAACACGGGTGAAACCCCGTCTCTATTAAAAAATAGAAAAAATTAGGCGGGCGTGGTGGT

         |*3191    |*3201    |*3211    |*3221    |*3231    |*3241
GAGCGCCTGTAGTCCCAGCTACTCGAGAGCCTGAGGCAGGAGAATGGCATGAACCTGGAA

         |*3251    |*3261    |*3271    |*3281    |*3291    |*3301
GGCGGAGCTTGCAGTGAGCTGAGATGGTGCCACTGCACTCTAACCTGGGCGACAGAGTGA

         |*3311    |*3321    |*3331    |*3341    |*3351    |*3361
GACACCGTCTCAAAAAAAAAAACAAAAAACAAAAATTATCCAGGTGTGGCGGTGGGCGCC

         |*3371    |*3381    |*3391    |*3401    |*3411    |*3421
TGTGAGGCAGGCGAATCTCTTGAACCCGGGAGGCGGAGGTTGCAGTGAGCCAAGATCACA

         |*3431    |*3441    |*3451    |*3461    |*3471    |*3481
CCATTGCACTCCAGCCTGGGCAACAAGAGTGAAATTCCATCTCAAAAAGAAACCAAAAAA

         |*3491    |*3501    |*3511    |*3521    |*3531    |*3541
ACAAAAAAAAAACATGCCGTTTGAGTACTGTGTTTTTGGTGTTGTCCAAGGAAAATTAAA

         |*3551    |*3561    |*3571    |*3581    |*3591    |*3601
AACCTGTAGCATGAATAATGTTTGTTTTTCATTTCGAATCTTGTGAATGTATTAAATATA

         |*3611    |*3621    |*3631    |*3641    |*3651    |*3661
TCGCTCTTAAGAGACGGTGAAGTTCCTATTTCAAGTTTTTTTTTTTTTTTTTTTTTTAA

         |*3671    |*3681    |*3691    |*3701   .    .    .
AGCTGTTTTTTAATACATTAAATGGTGCTGAGTAAAGGAAATAGgcagggtgtgttgtgt

   .    .    .    .    .    .    .    .    .    .    .    .
ggtgttttaactaggcgcttctctctcagagagttttgaaacctgtttacataaaggccc

   .    .    .    .    .    .    .    .    .    .    .    .
aggatgggaaggagatccaaacataagccaccagcctcattccaagtctcttctatttcc
```

```
   .    .    .    .    .    .    .    .    .    .    .    .
aaccctggatttttttttttatttaacattgtttcttttagctttatttttcttataaa

   .    .    .    .    .    .    .    .    .    .    .    .
agaaatgtatcactataaaaaattacacactacagaaaaatattaagaagaaaaacattc

   .    .    .    .    .    .    .    .    .
acatcggaaacaaagtttttcccatgaaaacagaacccaaaag
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LRG Parser: Version: 1.1, Version Date: 11/02/2015
Reader: Version: 1, Version Date: 11/02/2015
Writer: Version: 1, Version Date: 11/02/2015
Control: Version: 1, Version Date: 11/02/2015
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