



Next-generation sequencing (NGS) and/or Sanger sequencing is performed to test for the presence of variants in coding regions and intron/exon boundaries of the genes analyzed. NGS and/or a polymerase chain reaction (PCR)-based quantitative method is performed to test for the presence of deletions and duplications in the genes analyzed. Confirmation of select reportable variants may be performed by alternate methodologies based on internal laboratory criteria.

Genomic Build: GRCh37 (hg19) unless otherwise specified

<b>Gene</b>	<b>Reference Transcript<sup>a</sup></b>
<i>ABAT</i>	NM_020686.6
<i>AC02</i>	NM_001098.3
<i>ACY1</i>	NM_000666.3
<i>ADARB1<sup>c</sup></i>	NM_015833.4
<i>ADGRG1</i>	NM_005682.7
<i>ADSL</i>	NM_000026.4
<i>AFG3L2</i>	NM_006796.3
<i>AIFM1</i>	NM_004208.4
<i>AKT2</i>	NM_001626.6
<i>ALDH3A2</i>	NM_000382.3
<i>ALDH5A1</i>	NM_001080.3
<i>ALDH7A1</i>	NM_001182.5
<i>ALG13</i>	NM_001099922.3
<i>AMT</i>	NM_000481.4
<i>AP2M1</i>	NM_004068.4
<i>APOPT1 (COA8)</i>	NM_032374.4
<i>ARFGEF2</i>	NM_006420.3
<i>ARHGEF9</i>	NM_015185.3
<i>ARX</i>	NM_139058.3
<i>ASAH1<sup>c</sup></i>	NM_177924.5
<i>ASNS</i>	NM_133436.3
<i>ATN1</i>	NM_001007026.2
<i>ATP1A2</i>	NM_000702.4
<i>ATP1A3</i>	NM_152296.5
<i>ATRX</i>	NM_000489.5
<i>BCKDK</i>	NM_005881.4
<i>BCS1L</i>	NM_004328.5
<i>BOLA3</i>	NM_212552.3
<i>BRAT1</i>	NM_152743.4
<i>C12orf57</i>	NM_138425.4
<i>CACNA1A</i>	NM_001127221.1
<i>CACNA1E</i>	NM_000721.4
<i>CACNA2D2</i>	NM_006030.4
<i>CAD</i>	NM_004341.5
<i>CARS2</i>	NM_024537.4

<b>Gene</b>	<b>Reference Transcript<sup>a</sup></b>
<i>CASK<sup>c</sup></i>	NM_003688.3
<i>CASK<sup>c</sup></i>	NM_001126055.2
<i>CCM2</i>	NM_031443.3
<i>CDKL5<sup>c</sup></i>	NM_003159.2
<i>CDKL5</i>	NM_001323289.2
<i>CHD2</i>	NM_001271.4
<i>CHRNA2</i>	NM_000742.4
<i>CHRNA4</i>	NM_000744.6
<i>CHRNA2</i>	NM_000748.3
<i>CLCN4</i>	NM_001830.4
<i>CLN3</i>	NM_001042432.1
<i>CLN5</i>	NM_006493.4
<i>CLN6</i>	NM_017882.3
<i>CLN8</i>	NM_018941.4
<i>CNTNAP2</i>	NM_014141.6
<i>COA8 (APOPT1)</i>	NM_032374.4
<i>COG7</i>	NM_153603.4
<i>COG8</i>	NM_032382.4
<i>COL18A1<sup>c</sup></i>	ENST00000400337.6
<i>COL4A1</i>	NM_001845.6
<i>COQ2</i>	NM_015697.8
<i>COQ4</i>	NM_016035.5
<i>COQ6</i>	NM_182476.3
<i>COQ8A</i>	NM_020247.5
<i>COQ9</i>	NM_020312.4
<i>COX10<sup>c</sup></i>	NM_001303.4
<i>COX15<sup>c</sup></i>	NM_004376.7
<i>CPT2</i>	NM_000098.3
<i>CSF1R</i>	NM_005211.3
<i>CSTB<sup>d</sup></i>	NM_000100.3
<i>CTSD</i>	NM_001909.5
<i>CTSIF</i>	NM_003793.4
<i>CUL4B</i>	NM_003588.3
<i>D2HGDH</i>	NM_152783.5
<i>DCX</i>	NM_178153.3

## Targeted Genes and Methodology Details for Epilepsy Custom Gene Panel (continued)

Gene	Reference Transcript <sup>a</sup>
<i>DDC</i>	NM_000790.4
<i>DDX3X</i>	NM_001193416.3
<i>DEPDC5</i>	NM_001242896.3
<i>DHFR<sup>c</sup></i>	NM_000791.4
<i>DIAPH1</i>	NM_005219.5
<i>DLD</i>	NM_000108.5
<i>DMXL2</i>	NM_001174116.2
<i>DNAJC5</i>	NM_025219.3
<i>DNM1</i>	NM_004408.4
<i>DNM1L</i>	NM_012062.5
<i>DOCK7</i>	NM_001271999.1
<i>DYRK1A</i>	NM_001396.4
<i>EARS2</i>	NM_001083614.2
<i>EEF1A2</i>	NM_001958.5
<i>EHMT1<sup>c</sup></i>	NM_024757.5
<i>EIF2AK2</i>	NM_001135651.3
<i>EPM2A</i>	NM_005670.4
<i>ETHE1</i>	NM_014297.5
<i>FARS2</i>	NM_006567.5
<i>FASTKD2</i>	NM_014929.3
<i>FBP1</i>	NM_000507.4
<i>FBXL4</i>	NM_012160.4
<i>FH</i>	NM_000143.3
<i>FKRP</i>	NM_024301.5
<i>FKTN</i>	NM_001079802.1
<i>FLNA</i>	NM_001456.3
<i>FOLR1</i>	NM_016725.3
<i>FOXG1</i>	NM_005249.5
<i>FOXRED1</i>	NM_017547.4
<i>FRRS1L</i>	NM_014334.3
<i>GABBR2</i>	NM_005458.8
<i>GABRA1</i>	NM_000806.5
<i>GABRB2<sup>c</sup></i>	NM_021911.2
<i>GABRB3</i>	NM_000814.6
<i>GABRG2</i>	NM_000816.3
<i>GAMT</i>	NM_000156.6
<i>GATM</i>	NM_001482.3
<i>GCK</i>	NM_000162.5
<i>GFM1</i>	NM_024996.5
<i>GLDC</i>	NM_000170.2
<i>GLRA1</i>	NM_000171.4

Gene	Reference Transcript <sup>a</sup>
<i>GLUL</i>	NM_002065.6
<i>GNAO1<sup>c</sup></i>	NM_020988.3
<i>GOSR2<sup>c</sup></i>	NM_004287.4
<i>GPAA1</i>	NM_003801.4
<i>GPC3</i>	NM_004484.4
<i>GPHN</i>	NM_020806.4
<i>GRIA3</i>	NM_000828.4
<i>GRIN1</i>	NM_007327.4
<i>GRIN2A</i>	NM_000833.5
<i>GRIN2B</i>	NM_000834.4
<i>GYS2</i>	NM_021957.4
<i>HCFC1</i>	NM_005334.3
<i>HCN1</i>	NM_021072.4
<i>HIBCH</i>	NM_014362.4
<i>HNRNPU</i>	NM_031844.3
<i>HSD17B10</i>	NM_004493.3
<i>IARS2</i>	NM_018060.4
<i>IBA57</i>	NM_001010867.4
<i>IDH2</i>	NM_002168.3
<i>IER3IP1</i>	NM_016097.5
<i>IQSEC2</i>	NM_001111125.3
<i>ITPA</i>	NM_033453.4
<i>KANSL1<sup>c</sup></i>	NM_001193466.2
<i>KCNA1</i>	NM_000217.3
<i>KCNA2</i>	NM_004974.4
<i>KCNB1</i>	NM_004975.4
<i>KCNC1</i>	NM_001112741.1
<i>KCNH1</i>	NM_172362.3
<i>KCNJ10</i>	NM_002241.5
<i>KCNMA1</i>	NM_002247.4
<i>KCNMA1</i>	NM_001271520.2
<i>KCNQ2</i>	NM_172107.4
<i>KCNQ3</i>	NM_004519.4
<i>KCNT1</i>	NM_020822.3
<i>KCTD7</i>	NM_153033.4
<i>KDM5C</i>	NM_004187.4
<i>KDM6A</i>	NM_021140.3
<i>KRIT1</i>	NM_194456.1
<i>L2HGDH<sup>c</sup></i>	NM_024884.3
<i>LAMA2</i>	NM_000426.3
<i>LARGE1</i>	NM_004737.6

# Targeted Genes and Methodology Details for Epilepsy Custom Gene Panel (continued)

Gene	Reference Transcript <sup>a</sup>
<i>LG11</i>	NM_005097.4
<i>LIAS</i>	NM_006859.4
<i>LRPPRC<sup>c</sup></i>	NM_133259.4
<i>MBD5</i>	NM_018328.4
<i>MECP2</i>	NM_004992.3
<i>MECP2</i>	NM_001110792.2
<i>MEF2C</i>	NM_002397.5
<i>MFSD8</i>	NM_152778.3
<i>MICU1</i>	NM_006077.3
<i>MOCS1</i>	NM_005943.5
<i>MOCS2</i>	NM_176806.4
<i>MOCS2</i>	NM_004531.5
<i>MTFMT</i>	NM_139242.4
<i>MTO1</i>	NM_012123.4
<i>MTOR</i>	NM_004958.4
<i>NALCN</i>	NM_052867.4
<i>NDUFA1</i>	NM_004541.4
<i>NDUFA2</i>	NM_002488.4
<i>NDUFAF2</i>	NM_174889.5
<i>NDUFAF3</i>	NM_199069.2
<i>NDUFAF4</i>	NM_014165.4
<i>NDUFAF5</i>	NM_024120.5
<i>NDUFAF6</i>	NM_152416.4
<i>NDUFS1</i>	NM_005006.7
<i>NDUFS4</i>	NM_002495.4
<i>NDUFS6</i>	NM_004553.5
<i>NDUFS7</i>	NM_024407.5
<i>NDUFS8</i>	NM_002496.4
<i>NDUFV1</i>	NM_007103.4
<i>NECAP1</i>	NM_015509.4
<i>NEDD4L<sup>c</sup></i>	NM_015277.6
<i>NEU1</i>	NM_000434.4
<i>NEXMIF</i>	NM_001008537.3
<i>NGLY1</i>	NM_018297.4
<i>NHLRC1</i>	NM_198586.3
<i>NOTCH3</i>	NM_000435.3
<i>NPRL2</i>	NM_006545.5
<i>NPRL3</i>	NM_001077350.3 [GRCh38(hg38)]
<i>NR2F1</i>	NM_005654.6
<i>NR4A2</i>	NM_006186.4
<i>NRROS</i>	NM_198565.3

Gene	Reference Transcript <sup>a</sup>
<i>NRXN1<sup>c</sup></i>	NM_001135659.2
<i>OCLN<sup>b,c</sup></i>	NM_002538.4
<i>OFD1</i>	NM_003611.3
<i>OPHN1</i>	NM_002547.3
<i>OTUD6B</i>	NM_016023.5
<i>P4HTM</i>	NM_177938.2
<i>PACS1</i>	NM_018026.4
<i>PACS2</i>	NM_001100913.3
<i>PAFAH1B1<sup>c</sup></i>	NM_000430.4
<i>PAK3<sup>c</sup></i>	NM_002578.5
<i>PCDH12</i>	NM_016580.3
<i>PCDH19</i>	NM_001184880.2
<i>PDCD10</i>	NM_145860.1
<i>PDHA1</i>	NM_000284.4
<i>PDHB</i>	NM_000925.4
<i>PDHX</i>	NM_003477.3
<i>PDP1</i>	NM_018444.4
<i>PDSS2<sup>c</sup></i>	NM_020381.4
<i>PEX7</i>	NM_000288.4
<i>PHF6</i>	NM_032458.3
<i>PHGDH</i>	NM_006623.4
<i>PIGA</i>	NM_002641.3
<i>PIGG</i>	NM_001127178.3
<i>PIGK</i>	NM_005482.3
<i>PIGL</i>	NM_004278.4
<i>PIGM</i>	NM_145167.3
<i>PIGN<sup>c</sup></i>	NM_176787.5
<i>PIGO</i>	NM_032634.4
<i>PIGQ</i>	NM_004204.4
<i>PIGS</i>	NM_033198.4
<i>PIGT</i>	NM_015937.6
<i>PIGU</i>	NM_080476.4
<i>PIGV</i>	NM_017837.3
<i>PIGW</i>	NM_178517.4
<i>PLCB1</i>	NM_015192.4
<i>PLP1</i>	NM_000533.5
<i>PLPBP</i>	NM_007198.4
<i>PNKP</i>	NM_007254.4
<i>PNPLA8</i>	NM_015723.5
<i>PNPO</i>	NM_018129.4
<i>POLG</i>	NM_002693.2

# Targeted Genes and Methodology Details for Epilepsy Custom Gene Panel (continued)

Gene	Reference Transcript <sup>a</sup>
<i>POMGNT1</i>	NM_017739.3
<i>POMT1</i>	NM_007171.3
<i>POMT2</i>	NM_013382.5
<i>PPP2R5D</i>	NM_006245.4
<i>PPT1</i>	NM_000310.3
<i>PRRT2</i>	NM_145239.3
<i>PURA</i>	NM_005859.5
<i>QARS1</i>	NM_005051.3
<i>RAB39B</i>	NM_171998.4
<i>RAB3GAP1</i>	NM_012233.3
<i>RALA</i>	NM_005402.4
<i>RALGAP1<sup>c</sup></i>	NM_014990.3
<i>RANBP2<sup>b,c</sup></i>	NM_006267.5
<i>RARS2</i>	NM_020320.5
<i>RELN<sup>c</sup></i>	NM_005045.4
<i>RMND1</i>	NM_017909.4
<i>ROGDI</i>	NM_024589.2
<i>RRM2B</i>	NM_015713.5
<i>SATB2</i>	NM_015265.4
<i>SCARB2</i>	NM_005506.4
<i>SCN1A</i>	NM_001165963.3
<i>SCN1B<sup>c</sup></i>	NM_001037.5
<i>SCN2A</i>	NM_021007.3
<i>SCN2A</i>	NM_001040143.2
<i>SCN3A</i>	NM_006922.4
<i>SCN8A</i>	NM_014191.4
<i>SCN8A</i>	NM_001330260.2
<i>SC02</i>	NM_005138.2
<i>SDHAF1</i>	NM_001042631.2
<i>SERAC1<sup>c</sup></i>	NM_032861.4
<i>SERPINI1</i>	NM_005025.4
<i>SETBP1</i>	NM_015559.3
<i>SETD2<sup>c</sup></i>	NM_014159.6
<i>SIK1</i>	NM_173354.5
<i>SLC12A5</i>	NM_020708.5
<i>SLC13A5</i>	NM_177550.5
<i>SLC16A1</i>	NM_003051.3
<i>SLC19A3</i>	NM_025243.4
<i>SLC25A1</i>	NM_005984.5
<i>SLC25A12</i>	NM_003705.5
<i>SLC25A22</i>	NM_024698.6

Gene	Reference Transcript <sup>a</sup>
<i>SLC2A1</i>	NM_006516.3
<i>SLC35A2</i>	NM_001042498.3
<i>SLC35A3<sup>c</sup></i>	NM_012243.3
<i>SLC6A1</i>	NM_003042.4
<i>SLC6A8</i>	NM_005629.4
<i>SLC9A6</i>	NM_006359.3
<i>SLC9A6</i>	NM_001042537.1
<i>SMARCA2</i>	NM_003070.5
<i>SMC1A</i>	NM_006306.4
<i>SMS</i>	NM_004595.5
<i>SNAP25</i>	NM_003081.4
<i>SNAP25</i>	NM_130811.3
<i>SNAP29</i>	NM_004782.4
<i>SNX27</i>	NM_030918.6
<i>SPATA5</i>	NM_145207.3
<i>SPR</i>	NM_003124.5
<i>SPTAN1</i>	NM_001130438.3
<i>ST3GAL3</i>	NM_006279.5
<i>ST3GAL5</i>	NM_003896.4
<i>STRADA</i>	NM_001003787.4
<i>STX1B</i>	NM_052874.5
<i>STXBP1</i>	NM_003165.4
<i>STXBP1</i>	NM_001032221.4
<i>SUCLA2</i>	NM_003850.2
<i>SUOX</i>	NM_000456.3
<i>SYN1</i>	NM_133499.2
<i>SYNGAP1<sup>c</sup></i>	NM_006772.3
<i>SYNJ1</i>	NM_003895.3
<i>SYP</i>	NM_003179.2
<i>SZT2</i>	NM_015284.4
<i>TBC1D24</i>	NM_001199107.2
<i>TBL1XR1</i>	NM_024665.6
<i>TCF4</i>	NM_001083962.2
<i>TPK1</i>	NM_022445.4
<i>TPP1</i>	NM_000391.4
<i>TSC1</i>	NM_000368.5
<i>TSC2</i>	NM_000548.5
<i>TSFM<sup>c</sup></i>	NM_001172696.2
<i>TUBA1A<sup>c</sup></i>	NM_006009.4
<i>TUBA8</i>	NM_018943.3
<i>TUBB2B<sup>c</sup></i>	NM_178012.5

# Targeted Genes and Methodology Details for Epilepsy Custom Gene Panel (continued)

Gene	Reference Transcript <sup>a</sup>
<i>TWNK</i>	NM_021830.5
<i>UBE3A</i>	NM_130838.4
<i>UGP2</i>	NM_006759.3
<i>USP7</i>	NM_003470.3
<i>VARS2</i>	NM_001167734.1
<i>VLDLR</i>	NM_003383.5
<i>WDR26</i>	NM_025160.6

Gene	Reference Transcript <sup>a</sup>
<i>WDR37</i>	NM_014023.4
<i>WDR45</i>	NM_007075.3
<i>WDR62</i>	NM_001083961.2
<i>WWOX</i>	NM_016373.4
<i>YWHAG</i>	NM_012479.4
<i>ZDHHC9</i>	NM_016032.4
<i>ZEB2</i>	NM_014795.4

<sup>a</sup> Reference transcript numbers may be updated due to transcript re-versioning. Always refer to the final patient report for gene transcript information referenced at the time of testing.

<sup>b</sup> There are regions of this gene that cannot be effectively evaluated by sequencing as a result of technical limitations of the assay, including regions of homology, high GC content, and repetitive sequences.

<sup>c</sup> There are regions of this gene that cannot be effectively analyzed for the presence of copy number variants.

<sup>d</sup> A polymerase chain reaction-based assay is utilized to detect *CSTB* dodecamer repeat expansions in addition to sequence variants and deletions/duplications.

To verify if a specific region/exon/variant is covered by this assay, contact a laboratory genetic counselor at 800-533-1710.

## Available Epilepsy Panels

Test ID	Test Name	Genes
EPPAN	Comprehensive Epilepsy with or without Encephalopathy Gene Panel	<i>ABAT, ACO2, ACY1, ADARB1, ADGRG1, ADSL, AFG3L2, AIFM1, AKT2, ALDH3A2, ALDH5A1, ALDH7A1, ALG13, AMT, AP2M1, ARFGFE2, ARHGEF9, ARX, ASAH1, ASNS, ATN1, ATP1A2, ATP1A3, ATRX, BCKDK, BCS1L, BOLA3, BRAT1, C12orf57, CACNA1A, CACNA1E, CACNA2D2, CAD, CARS2, CASK, CASK, CCM2, CDKL5, CDKL5, CHD2, CHRNA2, CHRNA4, CHRN2, CLCN4, CLN3, CLN5, CLN6, CLN8, CNTNAP2, COA8, COG7, COG8, COL18A1, COL4A1, COQ2, COQ4, COQ6, COQ8A, COQ9, COX10, COX15, CPT2, CSF1R, CSTB, CTSD, CTSF, CUL4B, D2HGDH, DCX, DDC, DDX3X, DEPDC5, DHFR, DIAPH1, DLD, DMXL2, DNAJC5, DNM1, DNM1L, DOCK7, DYRK1A, EARS2, EEF1A2, EHMT1, EIF2AK2, EPM2A, ETHE1, FARS2, FASTKD2, FBP1, FBXL4, FH, FKR, FKTN, FLNA, FOLR1, FOXG1, FOXRED1, FRRS1L, GABBR2, GABRA1, GABRB2, GABRB3, GABRG2, GAMT, GATM, GCK, GFM1, GLDC, GLRA1, GLUL, GNAO1, GOSR2, GPAA1, GPC3, GPHN, GRIA3, GRIN1, GRIN2A, GRIN2B, GYS2, HCFC1, HCN1, HIBCH, HNRNPU, HSD17B10, IARS2, IBA57, IDH2, IER3IP1, IQSEC2, ITPA, KANSL1, KCNA1, KCNA2, KCNB1, KCNC1, KCNH1, KCNJ10, KCNMA1, KCNMA1, KCNQ2, KCNQ3, KCNT1, KCTD7, KDM5C, KDM6A, KRIT1, L2HGDH, LAMA2, LARGE1, LGI1, LIAS, LRPPRC, MBD5, MECP2, MECP2, MEF2C, MFSD8, MICU1, MOCS1, MOCS2, MOCS2, MTFMT, MTO1, MTOR, NALCN, NDUFA1, NDUFA2, NDUFAF2, NDUFAF3, NDUFAF4, NDUFAF5, NDUFAF6, NDUFS1, NDUFS4, NDUFS6, NDUFS7, NDUFS8, NDUFV1, NECAP1, NEDD4L, NEU1, NEXMIF, NGLY1, NHLRC1, NOTCH3, NPRL2, NPRL3, NR2F1, NR4A2, NRROS, NRXN1, OCLN, OFD1, OPHN1, OTUD6B, P4HTM, PACS1, PACS2, PAFAH1B1, PAK3, PCDH12, PCDH19, PDCD10, PDHA1, PDHB, PDHX, PDP1, PDSS2, PEX7, PHF6, PHGDH, PIGA, PIGG, PIGK, PIGL, PIGM, PIGN, PIGO, PIGQ, PIGS, PIGT, PIGU, PIGV, PIGW, PLCB1, PLP1, PLPBP, PNKP, PNPLA8, PNPO, POLG, POMGNT1, POMT1, POMT2, PPP2R5D, PPT1, PRRT2, PURA, QARS1, RAB39B, RAB3GAP1, RALA, RALGAP1, RANBP2, RARS2, RELN, RMND1, ROGDI, RRM2B, SATB2, SCARB2, SCN1A, SCN1B, SCN2A, SCN2A, SCN3A, SCN8A, SCN8A, SCO2, SDHAF1, SERAC1, SERPINI1, SETBP1, SETD2, SIK1, SLC12A5, SLC13A5, SLC16A1, SLC19A3, SLC25A1, SLC25A12, SLC25A22, SLC2A1, SLC35A2, SLC35A3, SLC6A1, SLC6A8, SLC9A6, SLC9A6, SMARCA2, SMC1A, SMS, SNAP25, SNAP25, SNAP29, SNX27, SPATA5, SPR, SPTAN1, ST3GAL3, ST3GAL5, STRADA, STX1B, STXBP1, STXBP1, SUCLA2, SUOX, SYN1, SYNGAP1, SYNJ1, SYP, SZT2, TBC1D24, TBL1XR1, TCF4, TPK1, TPP1, TSC1, TSC2, TSFM, TUBA1A, TUBA8, TUBB2B, TWNK, UBE3A, UGP2, USP7, VARS2, VLDLR, WDR26, WDR37, WDR45, WDR62, WWOX, YWHAG, ZDHHC9, ZEB2</i>
HMEP	Hemiplegic Migraine with or without Epilepsy Gene Panel, Varies	<i>ATP1A2, ATP1A3, CACNA1A, COL4A1, NOTCH3, POLG, PRRT2, SCN1A, SLC2A1</i>
TSCP	Tuberous Sclerosis Gene Panel, Varies	<i>TSC1, TSC2</i>