

# WES EPILEPSY DG 3.8.1

<i>Gene</i>	<i>Twist X2 covered &gt;10x</i>	<i>Twist X2 covered &gt;20x</i>	<i>WGS covered &gt;10x</i>	<i>WGS covered &gt;20x</i>	<i>Associated Phenotype description and OMIM disease ID</i>
AARS1	100.0%	100.0%	100.0%	99.5%	Developmental and epileptic encephalopathy 29, 616339;Charcot-Marie-Tooth disease, axonal, type 2N, 613287;?Leukoencephalopathy, hereditary diffuse, with spheroids 2, 619661;Trichothiodystrophy 8, nonphotosensitive, 619691
ABAT	100.0%	100.0%	100.0%	99.6%	GABA-transaminase deficiency, 613163
ABCC8	100.0%	100.0%	100.0%	99.7%	Diabetes mellitus, permanent neonatal 3, with or without neurologic features, 618857;Diabetes mellitus, transient neonatal 2, 610374;Diabetes mellitus, noninsulin-dependent, 125853;Hypoglycemia of infancy, leucine-sensitive, 240800;Hyperinsulinemic hypoglycemia, familial, 1, 256450
ACO2	100.0%	100.0%	100.0%	99.7%	Optic atrophy 9, 616289;Infantile cerebellar-retinal degeneration, 614559

ACTB	100.0%	100.0%	100.0%	99.9%	Baraitser-Winter syndrome 1, 243310;Becker nevus, syndromic or isolated, somatic mosaic, 604919;Thrombocytopenia 8, with dysmorphic features and developmental delay, 620475;Dystonia-deafness syndrome 1, 607371;Congenital smooth muscle hamartoma with or without hemihypertrophy, somatic mosaic, 620479
ACTL6B	100.0%	100.0%	100.0%	99.7%	Developmental and epileptic encephalopathy 76, 618468;Intellectual developmental disorder with severe speech and ambulation defects, 618470
ACY1	100.0%	100.0%	100.0%	99.8%	Aminoacylase 1 deficiency, 609924
ADSL	100.0%	100.0%	100.0%	99.4%	Adenylosuccinase deficiency, 103050
AGA	100.0%	100.0%	100.0%	99.6%	Aspartylglucosaminuria, 208400
ALDH5A1	100.0%	100.0%	100.0%	99.6%	Succinic semialdehyde dehydrogenase deficiency, 271980
ALDH7A1	100.0%	100.0%	100.0%	99.6%	Epilepsy, early-onset, 4, vitamin B6-dependent, 266100
ALG1	100.0%	100.0%	100.0%	99.9%	Congenital disorder of glycosylation, type Ik, 608540
ALG11	96.0%	96.0%	100.0%	99.5%	Congenital disorder of glycosylation, type Ip, 613661
ALG13	99.7%	99.0%	97.8%	72.7%	Developmental and epileptic encephalopathy 36, 300884
ALG3	100.0%	100.0%	100.0%	99.7%	Congenital disorder of glycosylation, type Id, 601110
ALG6	100.0%	100.0%	100.0%	98.8%	Congenital disorder of glycosylation, type Ic, 603147

AMACR	100.0%	100.0%	100.0%	99.1%	Alpha-methylacyl-CoA racemase deficiency, 614307;Bile acid synthesis defect, congenital, 4, 214950
AMPD2	100.0%	100.0%	100.0%	99.4%	Pontocerebellar hypoplasia, type 9, 615809;?Spastic paraplegia 63, autosomal recessive, 615686
AMT	100.0%	100.0%	100.0%	99.8%	Glycine encephalopathy 2, 620398
ANKRD11	100.0%	100.0%	100.0%	98.8%	KBG syndrome, 148050
AP1G1	100.0%	100.0%	100.0%	99.5%	Usmani-Riazuddin syndrome, autosomal recessive, 619548;Usmani-Riazuddin syndrome, autosomal dominant, 619467
AP3B2	100.0%	100.0%	100.0%	99.6%	Developmental and epileptic encephalopathy 48, 617276
ARHGEF9	96.7%	95.8%	98.9%	75.3%	Developmental and epileptic encephalopathy 8, 300607
ARID1B	98.6%	98.3%	99.9%	95.8%	Coffin-Siris syndrome 1, 135900
ARX	99.0%	96.7%	93.9%	63.3%	Proud syndrome, 300004;Hydranencephaly with abnormal genitalia, 300215;Partington syndrome, 309510;Developmental and epileptic encephalopathy 1, 308350;Lissencephaly, X-linked 2, 300215;Intellectual developmental disorder, X-linked 29, 300419
ASAH1	100.0%	100.0%	100.0%	99.3%	Spinal muscular atrophy with progressive myoclonic epilepsy, 159950;Farber lipogranulomatosis, 228000
ASL	100.0%	100.0%	100.0%	99.9%	Argininosuccinic aciduria, 207900
ASNS	100.0%	100.0%	100.0%	99.4%	Asparagine synthetase deficiency, 615574
ASXL3	100.0%	100.0%	100.0%	98.8%	Bainbridge-Ropers syndrome, 615485

ATN1	100.0%	100.0%	100.0%	98.9%	Dentatorubral-pallidoluysian atrophy, 125370; Congenital hypotonia, epilepsy, developmental delay, and digital anomalies, 618494
ATP1A1	100.0%	100.0%	100.0%	99.6%	Hypomagnesemia, seizures, and impaired intellectual development 2, 618314; Charcot-Marie-Tooth disease, axonal, type 2DD, 618036
ATP1A2	100.0%	100.0%	100.0%	99.7%	Developmental and epileptic encephalopathy 98, 619605; Fetal akinesia, respiratory insufficiency, microcephaly, polymicrogyria, and dysmorphic facies, 619602; Alternating hemiplegia of childhood 1, 104290; Migraine, familial basilar, 602481; Migraine, familial hemiplegic, 2, 602481
ATP1A3	100.0%	100.0%	100.0%	99.5%	Alternating hemiplegia of childhood 2, 614820; Dystonia-12, 128235; CAPOS syndrome, 601338; Developmental and epileptic encephalopathy 99, 619606
ATP6AP2	100.0%	100.0%	98.9%	74.3%	Intellectual developmental disorder, X-linked syndromic, Hedera type, 300423; ?Parkinsonism with spasticity, X-linked, 300911; Congenital disorder of glycosylation, type IIr, 301045
ATP7A	100.0%	100.0%	98.6%	73.8%	Occipital horn syndrome, 304150; Neuronopathy, distal hereditary motor, X-linked, 300489; Menkes disease, 309400

ATRX	99.9%	99.7%	96.9%	68.4%	Alpha-thalassemia myelodysplasia syndrome, somatic, 300448;Intellectual disability-hypotonic facies syndrome, X-linked, 309580;Alpha-thalassemia/impaired intellectual development syndrome, 301040
AUTS2	100.0%	100.0%	100.0%	99.7%	Intellectual developmental disorder, autosomal dominant 26, 615834
BOLA3	100.0%	100.0%	100.0%	99.4%	Multiple mitochondrial dysfunctions syndrome 2 with hyperglycinemia, 614299
BRAT1	100.0%	100.0%	100.0%	99.9%	Neurodevelopmental disorder with cerebellar atrophy and with or without seizures, 618056;Rigidity and multifocal seizure syndrome, lethal neonatal, 614498
BTD	94.4%	94.3%	100.0%	99.5%	Biotinidase deficiency, 253260
CACNA1A	100.0%	100.0%	100.0%	99.2%	Spinocerebellar ataxia 6, 183086;Episodic ataxia, type 2, 108500;Developmental and epileptic encephalopathy 42, 617106;Migraine, familial hemiplegic, 1, with progressive cerebellar ataxia, 141500;Migraine, familial hemiplegic, 1, 141500
CACNA1E	100.0%	100.0%	100.0%	99.7%	Developmental and epileptic encephalopathy 69, 618285
CACNA2D2	100.0%	100.0%	100.0%	99.5%	Cerebellar atrophy with seizures and variable developmental delay, 618501
CACNB4	100.0%	100.0%	100.0%	99.5%	{Epilepsy, juvenile myoclonic, susceptibility to, 6}, 607682;Episodic ataxia, type 5, 613855;{Epilepsy, idiopathic generalized, susceptibility to, 9}, 607682

CAD	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 50, 616457
CASK	100.0%	100.0%	98.7%	73.4%	Intellectual developmental disorder, with or without nystagmus, 300422;Intellectual developmental disorder and microcephaly with pontine and cerebellar hypoplasia, 300749;FG syndrome 4, 300422
CASQ2	100.0%	100.0%	100.0%	99.2%	Ventricular tachycardia, catecholaminergic polymorphic, 2, 611938
CCM2	100.0%	100.0%	100.0%	99.7%	Cerebral cavernous malformations-2, 603284
CDKL5	95.7%	95.3%	98.0%	71.6%	Developmental and epileptic encephalopathy 2, 300672
CERT1	100.0%	100.0%	100.0%	99.4%	Intellectual developmental disorder, autosomal dominant 34, 616351
CHD2	100.0%	100.0%	100.0%	99.3%	Developmental and epileptic encephalopathy 94, 615369
CHD5	100.0%	100.0%	100.0%	99.6%	Parenti-Mignot neurodevelopmental syndrome, 619873
CHRNA2	100.0%	100.0%	100.0%	99.8%	Epilepsy, nocturnal frontal lobe, type 4, 610353
CHRNA4	100.0%	100.0%	99.9%	98.8%	{Nicotine addiction, susceptibility to}, 188890;Epilepsy, nocturnal frontal lobe, 1, 600513
CHRNA2	100.0%	100.0%	100.0%	99.5%	Epilepsy, nocturnal frontal lobe, 3, 605375
CIC	100.0%	100.0%	100.0%	99.8%	Intellectual developmental disorder, autosomal dominant 45, 617600
CLCN4	100.0%	100.0%	99.0%	74.7%	Raynaud-Claes syndrome, 300114
CLDN16	100.0%	100.0%	100.0%	99.3%	Hypomagnesemia 3, renal, 248250

CLDN19	100.0%	100.0%	100.0%	99.8%	Hypomagnesemia 5, renal, with ocular involvement, 248190
CLN3	93.2%	93.1%	100.0%	99.3%	Ceroid lipofuscinosis, neuronal, 3, 204200
CLN5	83.1%	83.0%	100.0%	98.6%	Ceroid lipofuscinosis, neuronal, 5, 256731
CLN6	100.0%	100.0%	100.0%	99.6%	Ceroid lipofuscinosis, neuronal, 6B (Kufs type), 204300;Ceroid lipofuscinosis, neuronal, 6A, 601780
CLN8	100.0%	100.0%	100.0%	99.5%	Ceroid lipofuscinosis, neuronal, 8, Northern epilepsy variant, 610003;Ceroid lipofuscinosis, neuronal, 8, 600143
CNNM2	100.0%	100.0%	100.0%	99.6%	Hypomagnesemia 6, renal, 613882;Hypomagnesemia, seizures, and impaired intellectual development 1, 616418
CNTN2	100.0%	100.0%	100.0%	99.5%	?Epilepsy, myoclonic, familial adult, 5, 615400
CNTNAP2	100.0%	100.0%	100.0%	99.5%	Pitt-Hopkins like syndrome 1, 610042;{Autism susceptibility 15}, 612100
COA8	100.0%	99.9%	100.0%	98.9%	Mitochondrial complex IV deficiency, nuclear type 17, 619061
COL4A1	100.0%	100.0%	100.0%	99.2%	?Retinal arteries, tortuosity of, 180000;{Hemorrhage, intracerebral, susceptibility to}, 614519;Angiopathy, hereditary, with nephropathy, aneurysms, and muscle cramps, 611773;Microangiopathy and leukoencephalopathy, pontine, autosomal dominant, 618564;Brain small vessel disease with or without ocular anomalies, 175780

COLGALT1	100.0%	100.0%	100.0%	98.9%	Brain small vessel disease 3, 618360
COQ2	96.3%	96.3%	100.0%	99.7%	{Multiple system atrophy, susceptibility to}, 146500;Coenzyme Q10 deficiency, primary, 1, 607426
COQ4	100.0%	100.0%	100.0%	99.9%	Coenzyme Q10 deficiency, primary, 7, 616276;Spastic ataxia 10, autosomal recessive, 620666
COQ8A	100.0%	100.0%	100.0%	100.0%	Coenzyme Q10 deficiency, primary, 4, 612016
CPA6	100.0%	100.0%	100.0%	99.6%	Febrile seizures, familial, 11, 614418;Epilepsy, familial temporal lobe, 5, 614417
CPS1	100.0%	100.0%	100.0%	99.4%	Carbamoylphosphate synthetase I deficiency, 237300;{Pulmonary hypertension, neonatal, susceptibility to}, 615371
CPT2	100.0%	100.0%	100.0%	99.7%	{Encephalopathy, acute, infection-induced, 4, susceptibility to}, 614212;CPT II deficiency, infantile, 600649;CPT II deficiency, lethal neonatal, 608836;CPT II deficiency, myopathic, stress-induced, 255110
CSNK2B	100.0%	100.0%	100.0%	98.7%	Poirier-Bienvenu neurodevelopmental syndrome, 618732
CSTB	100.0%	100.0%	100.0%	99.7%	Epilepsy, progressive myoclonic 1A (Unverricht and Lundborg), 254800
CTSD	100.0%	100.0%	100.0%	99.9%	Ceroid lipofuscinosis, neuronal, 10, 610127
CTSF	100.0%	100.0%	100.0%	99.6%	Ceroid lipofuscinosis, neuronal, 13 (Kufs type), 615362



CUL4B	100.0%	99.9%	98.1%	72.0%	Intellectual developmental disorder, X-linked syndromic, Cabezas type, 300354
CUX2	100.0%	100.0%	100.0%	99.3%	Developmental and epileptic encephalopathy 67, 618141
D2HGDH	100.0%	100.0%	100.0%	99.7%	D-2-hydroxyglutaric aciduria, 600721
DARS1	100.0%	100.0%	100.0%	99.1%	Hypomyelination with brainstem and spinal cord involvement and leg spasticity, 615281
DARS2	100.0%	100.0%	100.0%	98.5%	Leukoencephalopathy with brain stem and spinal cord involvement and lactate elevation, 611105
DCX	98.9%	98.8%	98.5%	76.9%	Subcortical laminar heterotopia, X-linked, 300067;Lissencephaly, X-linked, 300067
DDX3X	99.1%	98.3%	98.9%	73.7%	Intellectual developmental disorder, X-linked syndromic, Snijders Blok type, 300958
DENND5A	100.0%	100.0%	100.0%	99.0%	Developmental and epileptic encephalopathy 49, 617281
DEPDC5	100.0%	100.0%	100.0%	99.5%	Epilepsy, familial focal, with variable foci 1, 604364;Developmental and epileptic encephalopathy 111, 620504
DHDDS	94.4%	94.4%	100.0%	99.5%	Developmental delay and seizures with or without movement abnormalities, 617836;?Congenital disorder of glycosylation, type 1bb, 613861;Retinitis pigmentosa 59, 613861
DIAPH1	100.0%	100.0%	100.0%	97.5%	Deafness, autosomal dominant 1, with or without thrombocytopenia, 124900;Seizures, cortical blindness, microcephaly syndrome, 616632

DLAT	100.0%	100.0%	100.0%	99.4%	Pyruvate dehydrogenase E2 deficiency, 245348
DNAJC5	100.0%	100.0%	100.0%	99.9%	Ceroid lipofuscinosis, neuronal, 4 (Kufs type), autosomal dominant, 162350
DNM1	100.0%	100.0%	100.0%	99.6%	Developmental and epileptic encephalopathy 31B, autosomal recessive, 620352;Developmental and epileptic encephalopathy 31A, autosomal dominant, 616346
DNM1L	100.0%	100.0%	100.0%	99.5%	Optic atrophy 5, 610708;Encephalopathy, lethal, due to defective mitochondrial peroxisomal fission 1, 614388
DOCK7	100.0%	100.0%	100.0%	99.0%	Developmental and epileptic encephalopathy 23, 615859
DPAGT1	100.0%	100.0%	100.0%	99.6%	Myasthenic syndrome, congenital, 13, with tubular aggregates, 614750;Congenital disorder of glycosylation, type Ij, 608093
DPM1	99.2%	96.6%	100.0%	98.6%	Congenital disorder of glycosylation, type Ie, 608799
DPM2	100.0%	100.0%	100.0%	99.3%	Congenital disorder of glycosylation, type Iu, 615042
DPYD	99.8%	99.6%	100.0%	99.4%	Dihydropyrimidine dehydrogenase deficiency, 274270;5-fluorouracil toxicity, 274270
DPYS	100.0%	100.0%	100.0%	99.5%	Dihydropyrimidinuria, 222748
DTYMK	100.0%	100.0%	100.0%	99.9%	Neurodegeneration, childhood-onset, with progressive microcephaly, 619847

DYNC1H1	100.0%	100.0%	100.0%	99.6%	Charcot-Marie-Tooth disease, axonal, type 2O, 614228;Spinal muscular atrophy, lower extremity-predominant 1, AD, 158600;Cortical dysplasia, complex, with other brain malformations 13, 614563
DYRK1A	100.0%	100.0%	100.0%	99.6%	Intellectual developmental disorder, autosomal dominant 7, 614104
EBP	100.0%	100.0%	99.2%	74.6%	MEND syndrome, 300960;Chondrodysplasia punctata, X-linked dominant, 302960
EEF1A2	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 33, 616409;Intellectual developmental disorder, autosomal dominant 38, 616393
EFHC1	97.8%	97.5%	100.0%	99.5%	{Epilepsy, juvenile absence, susceptibility to, 1}, 607631;{Myoclonic epilepsy, juvenile, susceptibility to, 1}, 254770
EGF	100.0%	100.0%	100.0%	99.3%	?Hypomagnesemia 4, renal, 611718
EHMT1	100.0%	99.9%	100.0%	99.4%	Kleefstra syndrome 1, 610253
EIF2B1	100.0%	100.0%	100.0%	99.8%	Leukoencephalopathy with vanishing white matter 1, with or without ovarian failure, 603896
EIF2B2	100.0%	100.0%	100.0%	99.5%	Leukoencephalopathy with vanishing white matter 2, with or without ovarian failure, 620312
EIF2B3	100.0%	100.0%	100.0%	99.1%	Leukoencephalopathy with vanishing white matter 3, with or without ovarian failure, 620313
EIF2B4	100.0%	100.0%	100.0%	99.7%	Leukoencephalopathy with vanishing white matter 4, with or without ovarian failure, 620314

EIF2B5	100.0%	100.0%	100.0%	99.4%	Leukoencephalopathy with vanishing white matter 5, with or without ovarian failure, 620315
EPM2A	100.0%	100.0%	100.0%	97.2%	Myoclonic epilepsy of Lafora 1, 254780
ETHE1	100.0%	100.0%	100.0%	99.3%	Ethylmalonic encephalopathy, 602473
EXOC7	100.0%	100.0%	100.0%	99.4%	Neurodevelopmental disorder with seizures and brain atrophy, 619072
EXOSC3	100.0%	100.0%	100.0%	99.8%	Pontocerebellar hypoplasia, type 1B, 614678
FA2H	100.0%	100.0%	100.0%	99.8%	Spastic paraplegia 35, autosomal recessive, 612319
FARS2	100.0%	100.0%	100.0%	99.5%	Combined oxidative phosphorylation deficiency 14, 614946;Spastic paraplegia 77, autosomal recessive, 617046
FGD1	99.9%	99.5%	98.6%	75.4%	Intellectual developmental disorder, X-linked syndromic 16, 305400;Aarskog-Scott syndrome, 305400
FGF12	100.0%	100.0%	100.0%	99.5%	Developmental and epileptic encephalopathy 47, 617166
FLNA	100.0%	99.9%	99.7%	83.8%	Otopalatodigital syndrome, type II, 304120;Intestinal pseudoobstruction, neuronal, 300048;Cardiac valvular dysplasia, X-linked, 314400;?FG syndrome 2, 300321;Melnick-Needles syndrome, 309350;Terminal osseous dysplasia, 300244;Congenital short bowel syndrome, 300048;Otopalatodigital syndrome, type I, 311300;Heterotopia, periventricular, 1, 300049;Frontometaphyseal dysplasia 1, 305620

FOLR1	100.0%	100.0%	100.0%	99.9%	Neurodegeneration due to cerebral folate transport deficiency, 613068
FOXG1	100.0%	99.9%	100.0%	98.6%	Rett syndrome, congenital variant, 613454
FOXRED1	100.0%	100.0%	100.0%	99.4%	Mitochondrial complex I deficiency, nuclear type 19, 618241
FRMPD4	100.0%	99.8%	98.2%	73.0%	Intellectual developmental disorder, X-linked 104, 300983
FRRS1L	100.0%	100.0%	100.0%	96.7%	Developmental and epileptic encephalopathy 37, 616981
FXVD2	100.0%	100.0%	100.0%	99.6%	Hypomagnesemia 2, renal, 154020
GABRA1	100.0%	100.0%	100.0%	99.5%	{Epilepsy, juvenile myoclonic, susceptibility to, 5}, 611136;Developmental and epileptic encephalopathy 19, 615744;{Epilepsy, childhood absence, susceptibility to, 4}, 611136
GABRA3	100.0%	99.9%	98.7%	75.0%	Epilepsy, X-linked 2, with or without impaired intellectual development and dysmorphic features, 301091
GABRB3	100.0%	100.0%	100.0%	99.3%	{Epilepsy, childhood absence, susceptibility to, 5}, 612269;Developmental and epileptic encephalopathy 43, 617113
GABRG2	92.9%	92.6%	100.0%	99.6%	Developmental and epileptic encephalopathy 74, 618396;Febrile seizures, familial, 8, 607681;Generalized epilepsy with febrile seizures plus, type 3, 607681
GAMT	100.0%	100.0%	100.0%	99.6%	Cerebral creatine deficiency syndrome 2, 612736

GCK	100.0%	100.0%	100.0%	99.7%	MODY, type II, 125851;Diabetes mellitus, permanent neonatal 1, 606176;Hyperinsulinemic hypoglycemia, familial, 3, 602485;Diabetes mellitus, noninsulin-dependent, late onset, 125853
GCSH	100.0%	100.0%	100.0%	99.3%	Multiple mitochondrial dysfunctions syndrome 7, 620423
GLDC	100.0%	100.0%	100.0%	99.6%	Glycine encephalopathy1, 605899
GLRA1	100.0%	100.0%	100.0%	99.7%	Hyperekplexia 1, 149400
GLRB	100.0%	100.0%	100.0%	99.2%	Hyperekplexia 2, 614619
GLS	100.0%	100.0%	100.0%	99.7%	Global developmental delay, progressive ataxia, and elevated glutamine, 618412;?Infantile cataract, skin abnormalities, glutamate excess, and impaired intellectual development, 618339;Developmental and epileptic encephalopathy 71, 618328
GLUD1	100.0%	100.0%	100.0%	99.4%	Hyperinsulinism-hyperammonemia syndrome, 606762
GNAO1	100.0%	100.0%	100.0%	99.6%	Developmental and epileptic encephalopathy 17, 615473;Neurodevelopmental disorder with involuntary movements, 617493
GOSR2	100.0%	100.0%	100.0%	99.4%	Epilepsy, progressive myoclonic 6, 614018;Muscular dystrophy, congenital, with or without seizures, 620166
GPC3	99.6%	98.9%	98.1%	72.5%	Wilms tumor, somatic, 194070;Simpson-Golabi-Behmel syndrome, type 1, 312870
GPHN	100.0%	99.9%	100.0%	99.3%	Molybdenum cofactor deficiency C, 615501

GRIA3	99.7%	99.2%	98.7%	72.8%	Intellectual developmental disorder, X-linked syndromic, Wu type, 300699
GRIN1	100.0%	100.0%	100.0%	99.5%	Neurodevelopmental disorder with or without hyperkinetic movements and seizures, autosomal recessive, 617820;Developmental and epileptic encephalopathy 101, 619814;Neurodevelopmental disorder with or without hyperkinetic movements and seizures, autosomal dominant, 614254
GRIN2A	99.8%	99.3%	100.0%	99.6%	Epilepsy, focal, with speech disorder and with or without impaired intellectual development, 245570
GRIN2B	99.9%	99.8%	100.0%	99.7%	Developmental and epileptic encephalopathy 27, 616139;Intellectual developmental disorder, autosomal dominant 6, with or without seizures, 613970
GRIN2D	99.7%	98.7%	100.0%	97.8%	Developmental and epileptic encephalopathy 46, 617162
GRN	100.0%	100.0%	100.0%	99.8%	Aphasia, primary progressive, 607485;Frontotemporal lobar degeneration with ubiquitin-positive inclusions, 607485;Ceroid lipofuscinosis, neuronal, 11, 614706
HACE1	100.0%	100.0%	100.0%	99.3%	Spastic paraplegia and psychomotor retardation with or without seizures, 616756
HADH	100.0%	100.0%	100.0%	99.6%	Hyperinsulinemic hypoglycemia, familial, 4, 609975;3-hydroxyacyl-CoA dehydrogenase deficiency, 231530

HCFC1	100.0%	99.9%	99.4%	80.5%	Methylmalonic aciduria and homocysteinemia, cblX type, 309541
HCN1	99.9%	99.7%	100.0%	99.2%	Developmental and epileptic encephalopathy 24, 615871;Generalized epilepsy with febrile seizures plus, type 10, 618482
HECW2	100.0%	100.0%	100.0%	99.6%	Neurodevelopmental disorder with hypotonia, seizures, and absent language, 617268
HLCS	100.0%	100.0%	100.0%	99.6%	Holocarboxylase synthetase deficiency, 253270
HNRNPU	100.0%	100.0%	100.0%	99.3%	Developmental and epileptic encephalopathy 54, 617391
HSD17B10	100.0%	99.8%	99.6%	75.5%	HSD10 mitochondrial disease, 300438
HSD17B4	96.6%	96.6%	100.0%	99.3%	D-bifunctional protein deficiency, 261515;Perrault syndrome 1, 233400
IDH2	100.0%	100.0%	100.0%	99.6%	D-2-hydroxyglutaric aciduria 2, 613657
IER3IP1	100.0%	100.0%	100.0%	99.6%	Microcephaly, epilepsy, and diabetes syndrome, 614231
IFIH1	100.0%	100.0%	100.0%	99.0%	Immunodeficiency 95, 619773;Aicardi-Goutieres syndrome 7, 615846;Singleton-Merten syndrome 1, 182250
IQSEC2	99.7%	98.4%	97.1%	69.8%	Intellectual developmental disorder, X-linked 1, 309530
IRF2BPL	100.0%	100.0%	100.0%	97.0%	Neurodevelopmental disorder with regression, abnormal movements, loss of speech, and seizures, 618088
ITPA	100.0%	100.0%	100.0%	99.0%	[Inosine triphosphatase deficiency], 613850;Developmental and epileptic encephalopathy 35, 616647



JAM3	100.0%	100.0%	100.0%	99.8%	Hemorrhagic destruction of the brain, subependymal calcification, and cataracts, 613730
KANSL1	100.0%	100.0%	100.0%	99.7%	Koolen-De Vries syndrome, 610443
KATNB1	100.0%	100.0%	100.0%	100.0%	Lissencephaly 6, with microcephaly, 616212
KCNA1	100.0%	100.0%	100.0%	99.6%	Episodic ataxia/myokymia syndrome, 160120
KCNA2	100.0%	100.0%	100.0%	99.2%	Developmental and epileptic encephalopathy 32, 616366
KCNA3	100.0%	100.0%	100.0%	99.6%	
KCNB1	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 26, 616056
KCNC1	100.0%	100.0%	100.0%	100.0%	Epilepsy, progressive myoclonic 7, 616187
KCND3	100.0%	100.0%	100.0%	99.7%	Spinocerebellar ataxia 19, 607346;Brugada syndrome 9, 616399
KCNH1	98.5%	98.5%	100.0%	99.5%	Zimmermann-Laband syndrome 1, 135500;Temple-Baraitser syndrome, 611816
KCNJ10	100.0%	100.0%	100.0%	99.6%	Enlarged vestibular aqueduct, digenic, 600791;SESAME syndrome, 612780
KCNJ11	100.0%	100.0%	100.0%	99.9%	Diabetes, permanent neonatal 2, with or without neurologic features, 618856;{Diabetes mellitus, type 2, susceptibility to}, 125853;Maturity-onset diabetes of the young, type 13, 616329;Diabetes mellitus, transient neonatal 3, 610582;Hyperinsulinemic hypoglycemia, familial, 2, 601820

KCNMA1	100.0%	99.9%	100.0%	99.2%	{Epilepsy, idiopathic generalized, susceptibility to, 16}, 618596;Paroxysmal nonkinesigenic dyskinesia, 3, with or without generalized epilepsy, 609446;Cerebellar atrophy, developmental delay, and seizures, 617643;Liang-Wang syndrome, 618729
KCNQ2	100.0%	100.0%	100.0%	99.7%	Developmental and epileptic encephalopathy 7, 613720;Seizures, benign neonatal, 1, 121200;Myokymia, 121200
KCNQ3	100.0%	100.0%	100.0%	99.3%	Seizures, benign neonatal, 2, 121201
KCNT1	100.0%	100.0%	100.0%	99.3%	Developmental and epileptic encephalopathy 14, 614959;Epilepsy nocturnal frontal lobe, 5, 615005
KCNT2	99.7%	99.4%	100.0%	99.5%	Developmental and epileptic encephalopathy 57, 617771
KCTD7	100.0%	100.0%	100.0%	99.9%	Epilepsy, progressive myoclonic 3, with or without intracellular inclusions, 611726
KDM5C	100.0%	99.9%	98.6%	75.4%	Intellectual developmental disorder, X-linked syndromic, Claes-Jensen type, 300534
KDM6B	100.0%	100.0%	100.0%	98.6%	Stolerman neurodevelopmental syndrome, 618505
KIF5A	100.0%	100.0%	100.0%	98.9%	Myoclonus, intractable, neonatal, 617235;{Amyotrophic lateral sclerosis, susceptibility to, 25}, 617921;Spastic paraplegia 10, autosomal dominant, 604187
KMT5B	100.0%	100.0%	100.0%	99.3%	Intellectual developmental disorder, autosomal dominant 51, 617788

KPTN	100.0%	100.0%	99.9%	99.2%	Intellectual developmental disorder, autosomal recessive 41, 615637
KRIT1	100.0%	100.0%	100.0%	99.0%	Hyperkeratotic cutaneous capillary-venous malformations associated with cerebral capillary malformations, 116860;Cerebral cavernous malformations-1, 116860;Cavernous malformations of CNS and retina, 116860
LAMB1	100.0%	100.0%	100.0%	99.4%	Lissencephaly 5, 615191
LGI1	100.0%	100.0%	100.0%	98.8%	Epilepsy, familial temporal lobe, 1, 600512
LIAS	100.0%	100.0%	100.0%	99.7%	Hyperglycinemia, lactic acidosis, and seizures, 614462
LIPT2	100.0%	100.0%	100.0%	99.6%	Encephalopathy, neonatal severe, with lactic acidosis and brain abnormalities, 617668
MAPK8IP3	100.0%	100.0%	100.0%	99.9%	Neurodevelopmental disorder with or without variable brain abnormalities, 618443
MAST3	100.0%	100.0%	100.0%	99.7%	Developmental and epileptic encephalopathy 108, 620115
MBD5	100.0%	100.0%	100.0%	99.3%	Intellectual developmental disorder, autosomal dominant 1, 156200

MECP2	100.0%	99.7%	99.1%	75.4%	Rett syndrome, atypical, 312750;Encephalopathy, neonatal severe, 300673;Intellectual developmental disorder, X-linked syndromic, Lubs type, 300260;{Autism susceptibility, X-linked 3}, 300496;Intellectual developmental disorder, X-linked syndromic 13, 300055;Rett syndrome, 312750;Rett syndrome, preserved speech variant, 312750
MED12	100.0%	99.8%	98.2%	71.9%	Lujan-Fryns syndrome, 309520;Ohdo syndrome, X-linked, 300895;Hardikar syndrome, 301068;Opitz-Kaveggia syndrome, 305450
MEF2C	100.0%	100.0%	100.0%	99.6%	Chromosome 5q14.3 deletion syndrome, 613443;Neurodevelopmental disorder with hypotonia, stereotypic hand movements, and impaired language, 613443
MFF	100.0%	100.0%	100.0%	99.6%	Encephalopathy due to defective mitochondrial and peroxisomal fission 2, 617086
MFSD8	100.0%	100.0%	100.0%	99.6%	Macular dystrophy with central cone involvement, 616170;Ceroid lipofuscinosis, neuronal, 7, 610951
MLC1	100.0%	100.0%	100.0%	99.8%	Megalencephalic leukoencephalopathy with subcortical cysts 1, 604004
MOCS1	100.0%	100.0%	100.0%	99.4%	Molybdenum cofactor deficiency A, 252150
MOCS2	100.0%	100.0%	100.0%	99.7%	Molybdenum cofactor deficiency B, 252160
MPDU1	100.0%	100.0%	100.0%	97.7%	Congenital disorder of glycosylation, type If, 609180

MPDZ	99.5%	99.1%	100.0%	99.3%	Hydrocephalus, congenital, 2, with or without brain or eye anomalies, 615219
MTFMT	100.0%	100.0%	100.0%	99.4%	Combined oxidative phosphorylation deficiency 15, 614947;Mitochondrial complex I deficiency, nuclear type 27, 618248
MTHFR	100.0%	100.0%	100.0%	99.7%	Homocystinuria due to MTHFR deficiency, 236250;{Thromboembolism, susceptibility to}, 188050;{Schizophrenia, susceptibility to}, 181500;{Neural tube defects, susceptibility to}, 601634;{Vascular disease, susceptibility to},
MTOR	100.0%	100.0%	100.0%	99.7%	Focal cortical dysplasia, type II, somatic, 607341;Smith-Kingsmore syndrome, 616638
MTRR	100.0%	100.0%	100.0%	98.9%	Homocystinuria-megaloblastic anemia, cbl E type, 236270;{Neural tube defects, folate-sensitive, susceptibility to}, 601634
NACC1	100.0%	100.0%	100.0%	99.6%	Neurodevelopmental disorder with epilepsy, cataracts, feeding difficulties, and delayed brain myelination, 617393
NANS	100.0%	100.0%	99.9%	99.1%	Spondyloepimetaphyseal dysplasia, Camera-Genevieve type, 610442
NARS2	100.0%	100.0%	100.0%	99.6%	Combined oxidative phosphorylation deficiency 24, 616239;?Deafness, autosomal recessive 94, 618434
NBEA	99.7%	99.2%	100.0%	99.6%	Neurodevelopmental disorder with or without early-onset generalized epilepsy, 619157
NCDN	100.0%	100.0%	100.0%	99.9%	Neurodevelopmental disorder with infantile epileptic spasms, 619373

NDUFA1	100.0%	100.0%	97.0%	73.1%	Mitochondrial complex I deficiency, nuclear type 12, 301020
NDUFA11	100.0%	98.8%	100.0%	98.5%	Mitochondrial complex I deficiency, nuclear type 14, 618236
NDUFAF1	100.0%	100.0%	100.0%	98.7%	Mitochondrial complex I deficiency, nuclear type 11, 618234
NDUFAF2	100.0%	100.0%	100.0%	99.7%	Mitochondrial complex I deficiency, nuclear type 10, 618233
NDUFAF3	100.0%	100.0%	100.0%	99.6%	Mitochondrial complex I deficiency, nuclear type 18, 618240
NDUFAF4	100.0%	100.0%	100.0%	98.6%	Mitochondrial complex I deficiency, nuclear type 15, 618237
NDUFAF5	100.0%	100.0%	100.0%	98.1%	Mitochondrial complex I deficiency, nuclear type 16, 618238
NDUFB3	100.0%	100.0%	100.0%	99.8%	Mitochondrial complex I deficiency, nuclear type 25, 618246
NDUFB9	100.0%	100.0%	100.0%	99.4%	?Mitochondrial complex I deficiency, nuclear type 24, 618245
NDUFS1	100.0%	100.0%	100.0%	99.1%	Mitochondrial complex I deficiency, nuclear type 5, 618226
NDUFS2	100.0%	100.0%	100.0%	99.2%	?Leber-like hereditary optic neuropathy, autosomal recessive 2, 620569;Mitochondrial complex I deficiency, nuclear type 6, 618228
NDUFS3	96.6%	91.3%	100.0%	99.5%	Mitochondrial complex I deficiency, nuclear type 8, 618230
NDUFS4	100.0%	99.9%	100.0%	99.1%	Mitochondrial complex I deficiency, nuclear type 1, 252010

NDUFS6	100.0%	100.0%	99.9%	99.0%	Mitochondrial complex I deficiency, nuclear type 9, 618232
NDUFV1	100.0%	100.0%	100.0%	99.6%	Mitochondrial complex I deficiency, nuclear type 4, 618225
NDUFV2	100.0%	100.0%	100.0%	99.5%	Mitochondrial complex I deficiency, nuclear type 7, 618229
NECAP1	100.0%	100.0%	100.0%	99.6%	Developmental and epileptic encephalopathy 21, 615833
NEDD4L	100.0%	100.0%	99.9%	98.6%	Periventricular nodular heterotopia 7, 617201
NEU1	100.0%	100.0%	100.0%	99.3%	Sialidosis, type II, 256550;Sialidosis, type I, 256550
NEXMIF	100.0%	99.9%	98.1%	71.7%	Intellectual developmental disorder, X-linked 98, 300912
NGLY1	100.0%	100.0%	100.0%	99.3%	Congenital disorder of deglycosylation 1, 615273
NHLRC1	100.0%	100.0%	100.0%	99.9%	Myoclonic epilepsy of Lafora 2, 620681
NPRL2	100.0%	100.0%	100.0%	99.8%	Epilepsy, familial focal, with variable foci 2, 617116
NPRL3	100.0%	100.0%	100.0%	99.6%	Epilepsy, familial focal, with variable foci 3, 617118
NR2F1	100.0%	99.9%	100.0%	98.5%	Bosch-Boonstra-Schaaf optic atrophy syndrome, 615722
NR4A2	100.0%	100.0%	100.0%	99.5%	Intellectual developmental disorder with language impairment and early-onset DOPA-responsive dystonia-parkinsonism, 619911
NRXN1	99.8%	99.7%	100.0%	99.8%	Pitt-Hopkins-like syndrome 2, 614325;{Schizophrenia, susceptibility to, 17}, 614332
NUBPL	100.0%	100.0%	100.0%	99.5%	Mitochondrial complex I deficiency, nuclear type 21, 618242

NUS1	100.0%	100.0%	100.0%	99.7%	Intellectual developmental disorder, autosomal dominant 55, with seizures, 617831;?Congenital disorder of glycosylation, type 1aa, 617082
OCLN	100.0%	100.0%	99.9%	97.1%	Pseudo-TORCH syndrome 1, 251290
OFD1	100.0%	100.0%	97.9%	69.5%	Simpson-Golabi-Behmel syndrome, type 2, 300209;?Retinitis pigmentosa 23, 300424;Orofaciodigital syndrome I, 311200;Joubert syndrome 10, 300804
OGDHL	100.0%	100.0%	100.0%	99.7%	Yoon-Bellen neurodevelopmental syndrome, 619701
OPHN1	100.0%	99.9%	98.5%	72.8%	Intellectual developmental disorder, X-linked syndromic, Billuart type, 300486
PACS1	100.0%	100.0%	100.0%	99.5%	Schuurs-Hoeijmakers syndrome, 615009
PACS2	100.0%	100.0%	100.0%	99.2%	Developmental and epileptic encephalopathy 66, 618067
PAFAH1B1	100.0%	100.0%	100.0%	99.3%	Subcortical laminar heterotopia, 607432;Lissencephaly 1, 607432
PAK3	99.8%	99.3%	98.3%	70.4%	Intellectual developmental disorder, X-linked 30, 300558
PC	100.0%	100.0%	100.0%	99.8%	Pyruvate carboxylase deficiency, 266150
PCDH19	100.0%	99.9%	98.8%	75.9%	Developmental and epileptic encephalopathy 9, 300088
PDCD10	100.0%	100.0%	100.0%	98.9%	Cerebral cavernous malformations-3, 603285
PDHA1	99.7%	97.5%	99.1%	75.1%	Pyruvate dehydrogenase E1-alpha deficiency, 312170
PDHB	100.0%	100.0%	100.0%	99.2%	Pyruvate dehydrogenase E1-beta deficiency, 614111



PDHX	100.0%	99.8%	100.0%	99.4%	Lacticacidemia due to PDX1 deficiency, 245349
PDP1	100.0%	100.0%	100.0%	99.9%	Pyruvate dehydrogenase phosphatase deficiency, 608782
PDX1	100.0%	100.0%	100.0%	100.0%	{Diabetes mellitus, type II, susceptibility to}, 125853;Pancreatic agenesis 1, 260370;MODY, type IV, 606392
PET100	100.0%	100.0%	100.0%	99.8%	Mitochondrial complex IV deficiency, nuclear type 12, 619055
PEX1	100.0%	100.0%	100.0%	99.3%	Heimler syndrome 1, 234580;Peroxisome biogenesis disorder 1B (NALD/IRD), 601539;Peroxisome biogenesis disorder 1A (Zellweger), 214100
PEX10	100.0%	100.0%	100.0%	100.0%	Peroxisome biogenesis disorder 6A (Zellweger), 614870;Peroxisome biogenesis disorder 6B, 614871
PEX12	100.0%	100.0%	100.0%	99.4%	Peroxisome biogenesis disorder 3B, 266510;Peroxisome biogenesis disorder 3A (Zellweger), 614859
PEX13	100.0%	100.0%	100.0%	99.0%	Peroxisome biogenesis disorder 11A (Zellweger), 614883;Peroxisome biogenesis disorder 11B, 614885
PEX14	100.0%	100.0%	100.0%	99.8%	Peroxisome biogenesis disorder 13A (Zellweger), 614887
PEX16	100.0%	100.0%	100.0%	99.3%	Peroxisome biogenesis disorder 8B, 614877;Peroxisome biogenesis disorder 8A (Zellweger), 614876
PEX19	100.0%	100.0%	100.0%	99.6%	Peroxisome biogenesis disorder 12A (Zellweger), 614886

PEX26	100.0%	100.0%	100.0%	99.2%	Peroxisome biogenesis disorder 7B, 614873;Peroxisome biogenesis disorder 7A (Zellweger), 614872
PEX3	100.0%	100.0%	100.0%	98.9%	Peroxisome biogenesis disorder 10A (Zellweger), 614882;?Peroxisome biogenesis disorder 10B, 617370
PEX5	100.0%	100.0%	100.0%	99.4%	Peroxisome biogenesis disorder 2B, 202370;Peroxisome biogenesis disorder 2A (Zellweger), 214110;Rhizomelic chondrodysplasia punctata, type 5, 616716
PEX6	100.0%	100.0%	100.0%	99.5%	Peroxisome biogenesis disorder 4B, 614863;Peroxisome biogenesis disorder 4A (Zellweger), 614862;Heimler syndrome 2, 616617
PGAP3	100.0%	100.0%	100.0%	99.8%	Hyperphosphatasia with impaired intellectual development syndrome 4, 615716
PHF6	100.0%	100.0%	98.9%	75.6%	Borjeson-Forsman-Lehmann syndrome, 301900
PHGDH	100.0%	100.0%	100.0%	99.8%	Neu-Laxova syndrome 1, 256520;Phosphoglycerate dehydrogenase deficiency, 601815
PIGA	100.0%	100.0%	98.6%	74.5%	Paroxysmal nocturnal hemoglobinuria, somatic, 300818;Multiple congenital anomalies-hypotonia-seizures syndrome 2, 300868;Neurodevelopmental disorder with epilepsy and hemochromatosis, 301072

PIGN	100.0%	99.9%	100.0%	99.3%	Multiple congenital anomalies-hypotonia-seizures syndrome 1, 614080
PIGO	100.0%	100.0%	100.0%	99.9%	Hyperphosphatasia with impaired intellectual development syndrome 2, 614749
PIGP	100.0%	100.0%	100.0%	99.2%	Developmental and epileptic encephalopathy 55, 617599
PIGT	100.0%	100.0%	100.0%	99.3%	?Paroxysmal nocturnal hemoglobinuria 2, 615399;Multiple congenital anomalies-hypotonia-seizures syndrome 3, 615398
PLA2G6	100.0%	99.9%	100.0%	99.5%	Parkinson disease 14, autosomal recessive, 612953;Neurodegeneration with brain iron accumulation 2B, 610217;Infantile neuroaxonal dystrophy 1, 256600
PLCB1	100.0%	100.0%	100.0%	99.2%	Developmental and epileptic encephalopathy 12, 613722
PLP1	99.9%	98.9%	98.5%	73.5%	Pelizaeus-Merzbacher disease, 312080;Spastic paraplegia 2, X-linked, 312920
PLPBP	100.0%	100.0%	100.0%	99.5%	Epilepsy, early-onset, 1, vitamin B6-dependent, 617290
PMM2	100.0%	100.0%	100.0%	98.7%	Congenital disorder of glycosylation, type Ia, 212065
PNKP	100.0%	100.0%	100.0%	99.9%	?Charcot-Marie-Tooth disease, type 2B2, 605589;Ataxia-oculomotor apraxia 4, 616267;Microcephaly, seizures, and developmental delay, 613402
PNPO	100.0%	100.0%	100.0%	99.8%	Pyridoxamine 5'-phosphate oxidase deficiency, 610090

POLG	100.0%	100.0%	100.0%	99.8%	Mitochondrial recessive ataxia syndrome (includes SANDO and SCAE), 607459;Mitochondrial DNA depletion syndrome 4B (MNGIE type), 613662;Mitochondrial DNA depletion syndrome 4A (Alpers type), 203700;Progressive external ophthalmoplegia, autosomal dominant 1, 157640;Progressive external ophthalmoplegia, autosomal recessive 1, 258450
PPP2R1A	93.7%	93.6%	100.0%	99.7%	Houge-Janssens syndrome 2, 616362
PPP2R5D	100.0%	100.0%	100.0%	99.6%	Houge-Janssens syndrome 1, 616355
PPT1	90.3%	90.3%	100.0%	99.4%	Ceroid lipofuscinosis, neuronal, 1, 256730
PQBP1	100.0%	100.0%	99.3%	73.8%	Renpenning syndrome, 309500
PRF1	100.0%	100.0%	100.0%	100.0%	Hemophagocytic lymphohistiocytosis, familial, 2, 603553;Aplastic anemia, 609135;Lymphoma, non-Hodgkin, 605027
PRICKLE1	100.0%	100.0%	100.0%	99.1%	Epilepsy, progressive myoclonic 1B, 612437
PRRT2	100.0%	100.0%	100.0%	99.4%	Convulsions, familial infantile, with paroxysmal choreoathetosis, 602066;Seizures, benign familial infantile, 2, 605751;Episodic kinesigenic dyskinesia 1, 128200

PSAP	100.0%	100.0%	100.0%	99.8%	Combined SAP deficiency, 611721;Krabbe disease, atypical, 611722;Metachromatic leukodystrophy due to SAP-b deficiency, 249900;Gaucher disease, atypical, 610539;{Parkinson disease 24, autosomal dominant, susceptibility to}, 619491
PTRH2	100.0%	100.0%	100.0%	99.9%	Infantile-onset multisystem neurologic, endocrine, and pancreatic disease, 616263
PTS	100.0%	100.0%	100.0%	99.0%	Hyperphenylalaninemia, BH4-deficient, A, 261640
PUM1	100.0%	100.0%	100.0%	99.4%	Spinocerebellar ataxia 47, 617931;Neurodevelopmental disorder with motor abnormalities, seizures, and facial dysmorphism, 620719
PURA	100.0%	100.0%	100.0%	99.6%	Neurodevelopmental disorder with neonatal respiratory insufficiency, hypotonia, and feeding difficulties, 616158
PYCR2	100.0%	100.0%	100.0%	99.9%	Leukodystrophy, hypomyelinating, 10, 616420
QARS1	100.0%	100.0%	100.0%	99.7%	Microcephaly, progressive, seizures, and cerebral and cerebellar atrophy, 615760
QDPR	100.0%	100.0%	100.0%	99.0%	Hyperphenylalaninemia, BH4-deficient, C, 261630
RAB39B	100.0%	100.0%	99.1%	76.4%	Intellectual developmental disorder, X-linked 72, 300271;Waisman syndrome, 311510
RARS2	100.0%	100.0%	100.0%	99.5%	Pontocerebellar hypoplasia, type 6, 611523
RHOBTB2	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 64, 618004
RNASEH2A	100.0%	100.0%	100.0%	99.9%	Aicardi-Goutieres syndrome 4, 610333

RNASEH2B	91.4%	91.4%	100.0%	98.8%	Aicardi-Goutieres syndrome 2, 610181
RNASEH2C	100.0%	100.0%	100.0%	99.7%	Aicardi-Goutieres syndrome 3, 610329
ROGDI	100.0%	100.0%	100.0%	99.8%	Kohlschutter-Tonz syndrome, 226750
RPS6KA3	99.9%	99.5%	98.4%	74.0%	Intellectual developmental disorder, X-linked 19, 300844;Coffin-Lowry syndrome, 303600
RRM2B	100.0%	100.0%	100.0%	98.9%	Mitochondrial DNA depletion syndrome 8B (MNGIE type), 612075;Mitochondrial DNA depletion syndrome 8A (encephalomyopathic type with renal tubulopathy), 612075;Rod-cone dystrophy, sensorineural deafness, and Fanconi-type renal dysfunction, 268315;Progressive external ophthalmoplegia with mitochondrial DNA deletions, autosomal dominant 5, 613077
SAMHD1	100.0%	100.0%	100.0%	99.2%	?Chilblain lupus 2, 614415;Aicardi-Goutieres syndrome 5, 612952
SCAF4	100.0%	100.0%	100.0%	99.5%	Fliedner-Zweier syndrome, 620511
SCARB2	100.0%	100.0%	100.0%	99.5%	Epilepsy, progressive myoclonic 4, with or without renal failure, 254900
SCN1A	100.0%	100.0%	100.0%	99.4%	Developmental and epileptic encephalopathy 6B, non-Dravet, 619317;Migraine, familial hemiplegic, 3, 609634;Dravet syndrome, 607208;Febrile seizures, familial, 3A, 604403;Generalized epilepsy with febrile seizures plus, type 2, 604403

SCN1B	100.0%	100.0%	100.0%	99.7%	Generalized epilepsy with febrile seizures plus, type 1, 604233;Developmental and epileptic encephalopathy 52, 617350;Cardiac conduction defect, nonspecific, 612838;Atrial fibrillation, familial, 13, 615377;Brugada syndrome 5, 612838
SCN2A	100.0%	100.0%	100.0%	99.4%	Seizures, benign familial infantile, 3, 607745;Developmental and epileptic encephalopathy 11, 613721;Episodic ataxia, type 9, 618924
SCN3A	100.0%	100.0%	100.0%	99.0%	Epilepsy, familial focal, with variable foci 4, 617935;Developmental and epileptic encephalopathy 62, 617938
SCN8A	100.0%	100.0%	100.0%	99.3%	?Myoclonus, familial, 2, 618364;Seizures, benign familial infantile, 5, 617080;Cognitive impairment with or without cerebellar ataxia, 614306;Developmental and epileptic encephalopathy 13, 614558
SEMA6B	100.0%	100.0%	100.0%	99.8%	Epilepsy, progressive myoclonic, 11, 618876
SEPSECS	100.0%	100.0%	100.0%	99.5%	Pontocerebellar hypoplasia type 2D, 613811
SERPINI1	100.0%	100.0%	100.0%	98.6%	Encephalopathy, familial, with neuroserpin inclusion bodies, 604218
SHANK3	99.8%	99.3%	99.9%	99.0%	Phelan-McDermid syndrome, 606232;{Schizophrenia 15}, 613950
SIK1	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 30, 616341

SLC12A5	100.0%	100.0%	100.0%	99.6%	{Epilepsy, idiopathic generalized, susceptibility to, 14}, 616685;Developmental and epileptic encephalopathy 34, 616645
SLC13A5	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 25, with amelogenesis imperfecta, 615905
SLC16A1	100.0%	100.0%	100.0%	100.0%	Hyperinsulinemic hypoglycemia, familial, 7, 610021;Erythrocyte lactate transporter defect, 245340;Monocarboxylate transporter 1 deficiency, 616095
SLC19A3	99.6%	98.4%	100.0%	99.6%	Thiamine metabolism dysfunction syndrome 2 (biotin/thiamine-responsive basal ganglia disease type), 607483
SLC1A2	100.0%	99.8%	100.0%	99.4%	Developmental and epileptic encephalopathy 41, 617105
SLC25A1	100.0%	100.0%	100.0%	99.0%	Combined D-2- and L-2-hydroxyglutaric aciduria, 615182;Myasthenic syndrome, congenital, 23, presynaptic, 618197
SLC25A15	100.0%	100.0%	100.0%	99.9%	Hyperornithinemia-hyperammonemia-homocitrullinemia syndrome, 238970
SLC25A22	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 3, 609304
SLC2A1	100.0%	100.0%	100.0%	99.8%	Dystonia 9, 601042;GLUT1 deficiency syndrome 1, infantile onset, severe, 606777;Stomatin-deficient cryohydrocytosis with neurologic defects, 608885;{Epilepsy, idiopathic generalized, susceptibility to, 12}, 614847;GLUT1 deficiency syndrome 2, childhood onset, 612126



SLC35A2	100.0%	100.0%	99.3%	79.1%	Congenital disorder of glycosylation, type II <sub>m</sub> , 300896
SLC6A1	100.0%	100.0%	100.0%	99.6%	Myoclonic-atonic epilepsy, 616421
SLC6A8	100.0%	99.6%	98.5%	80.3%	Cerebral creatine deficiency syndrome 1, 300352
SLC9A6	100.0%	99.9%	98.6%	72.8%	Intellectual developmental disorder, X-linked syndromic, Christianson type, 300243
SMARCA2	100.0%	99.8%	100.0%	99.7%	Nicolaidis-Baraitser syndrome, 601358;Blepharophimosis-impaired intellectual development syndrome, 619293
SMC1A	100.0%	99.8%	98.5%	73.6%	Cornelia de Lange syndrome 2, 300590;Developmental and epileptic encephalopathy 85, with or without midline brain defects, 301044
SMPD4	100.0%	100.0%	100.0%	99.7%	Neurodevelopmental disorder with microcephaly, arthrogryposis, and structural brain anomalies, 618622
SMS	100.0%	99.4%	98.6%	76.0%	Intellectual developmental disorder, X-linked syndromic, Snyder-Robinson type, 309583
SNAP25	100.0%	100.0%	100.0%	99.5%	?Myasthenic syndrome, congenital, 18, 616330
SPATA5	100.0%	100.0%	100.0%	99.6%	Neurodevelopmental disorder with hearing loss, seizures, and brain abnormalities, 616577

SPTAN1	100.0%	100.0%	100.0%	99.6%	Developmental delay with or without epilepsy, 620540;Developmental and epileptic encephalopathy 5, 613477;Spastic paraplegia 91, autosomal dominant, with or without cerebellar ataxia, 620538;Neuronopathy, distal hereditary motor, autosomal dominant 11, 620528
ST3GAL3	97.4%	95.3%	100.0%	99.6%	Developmental and epileptic encephalopathy 15, 615006;Intellectual developmental disorder, autosomal recessive 12, 611090
ST3GAL5	98.3%	98.3%	100.0%	99.3%	Salt and pepper developmental regression syndrome, 609056
STRADA	100.0%	100.0%	100.0%	99.5%	Polyhydramnios, megalencephaly, and symptomatic epilepsy, 611087
STX1B	100.0%	100.0%	100.0%	99.3%	Generalized epilepsy with febrile seizures plus, type 9, 616172
STXBP1	100.0%	100.0%	100.0%	99.6%	Developmental and epileptic encephalopathy 4, 612164
SUOX	100.0%	100.0%	100.0%	99.5%	Sulfite oxidase deficiency, 272300
SYN1	100.0%	100.0%	98.5%	73.4%	Epilepsy, X-linked 1, with variable learning disabilities and behavior disorders, 300491;Intellectual developmental disorder, X-linked 50, 300115
SYNGAP1	100.0%	100.0%	100.0%	98.0%	Intellectual developmental disorder, autosomal dominant 5, 612621
SYNJ1	100.0%	100.0%	100.0%	99.3%	Parkinson disease 20, early-onset, 615530;Developmental and epileptic encephalopathy 53, 617389

SYP	100.0%	99.8%	98.6%	75.5%	Intellectual developmental disorder, X-linked 96, 300802
SZT2	100.0%	100.0%	100.0%	99.7%	Developmental and epileptic encephalopathy 18, 615476
TANGO2	100.0%	100.0%	100.0%	99.4%	Metabolic encephalomyopathic crises, recurrent, with rhabdomyolysis, cardiac arrhythmias, and neurodegeneration, 616878
TBC1D23	100.0%	100.0%	100.0%	99.3%	Pontocerebellar hypoplasia, type 11, 617695
TBC1D24	100.0%	100.0%	100.0%	100.0%	Deafness, autosomal recessive 86, 614617;Epilepsy, rolandic, with paroxysmal exercise-induce dystonia and writer's cramp, 608105;Myoclonic epilepsy, infantile, familial, 605021;Deafness, autosomal dominant 65, 616044;Developmental and epileptic encephalopathy 16, 615338;DOORS syndrome, 220500
TBCD	100.0%	100.0%	100.0%	99.8%	Encephalopathy, progressive, early-onset, with brain atrophy and thin corpus callosum, 617193
TBCE	100.0%	100.0%	100.0%	99.5%	Kenny-Caffey syndrome, type 1, 244460;Hypoparathyroidism-retardation-dysmorphism syndrome, 241410;Encephalopathy, progressive, with amyotrophy and optic atrophy, 617207
TCF4	100.0%	100.0%	100.0%	99.3%	Pitt-Hopkins syndrome, 610954;Corneal dystrophy, Fuchs endothelial, 3, 613267
TDP2	100.0%	100.0%	100.0%	99.6%	Spinocerebellar ataxia, autosomal recessive 23, 616949

TOE1	100.0%	100.0%	100.0%	99.5%	Pontocerebellar hypoplasia, type 7, 614969
TPP1	100.0%	100.0%	100.0%	99.8%	Ceroid lipofuscinosis, neuronal, 2, 204500;Spinocerebellar ataxia, autosomal recessive 7, 609270
TREX1	100.0%	100.0%	100.0%	100.0%	Vasculopathy, retinal, with cerebral leukoencephalopathy and systemic manifestations, 192315;Aicardi-Goutieres syndrome 1, dominant and recessive, 225750;{Systemic lupus erythematosus, susceptibility to}, 152700;Chilblain lupus, 610448
TRIT1	100.0%	100.0%	100.0%	99.7%	Combined oxidative phosphorylation deficiency 35, 617873
TRPM3	100.0%	100.0%	100.0%	99.5%	?Cataract 50 with or without glaucoma, 620253;Neurodevelopmental disorder with hypotonia, dysmorphic facies, and skeletal anomalies, with or without seizures, 620224
TRPM6	100.0%	100.0%	100.0%	99.4%	Hypomagnesemia 1, intestinal, 602014
TSC1	100.0%	100.0%	100.0%	99.4%	Focal cortical dysplasia, type II, somatic, 607341;Tuberous sclerosis-1, 191100;Lymphangi leiomyomatosis, 606690
TSC2	100.0%	100.0%	100.0%	99.8%	Lymphangi leiomyomatosis, somatic, 606690;?Focal cortical dysplasia, type II, somatic, 607341;Tuberous sclerosis-2, 613254
TSEN15	100.0%	100.0%	100.0%	99.7%	Pontocerebellar hypoplasia, type 2F, 617026
TSEN2	100.0%	100.0%	100.0%	99.1%	Pontocerebellar hypoplasia type 2B, 612389

TSEN54	100.0%	100.0%	100.0%	99.8%	Pontocerebellar hypoplasia type 2A, 277470;Pontocerebellar hypoplasia type 4, 225753;?Pontocerebellar hypoplasia type 5, 610204
TUBA1A	100.0%	100.0%	100.0%	99.4%	Lissencephaly 3, 611603
TUBB2A	100.0%	100.0%	100.0%	99.8%	Cortical dysplasia, complex, with other brain malformations 5, 615763
TUBB2B	100.0%	100.0%	100.0%	100.0%	Cortical dysplasia, complex, with other brain malformations 7, 610031
TUBB4A	98.9%	95.9%	100.0%	99.8%	Dystonia 4, torsion, autosomal dominant, 128101;Leukodystrophy, hypomyelinating, 6, 612438
TUBG1	100.0%	100.0%	100.0%	99.6%	Cortical dysplasia, complex, with other brain malformations 4, 615412
UBA5	100.0%	100.0%	100.0%	98.9%	?Spinocerebellar ataxia, autosomal recessive 24, 617133;Developmental and epileptic encephalopathy 44, 617132
UBE3A	100.0%	100.0%	100.0%	99.3%	Angelman syndrome, 105830
UBTF	100.0%	100.0%	100.0%	99.1%	Neurodegeneration, childhood-onset, with brain atrophy, 617672
UGP2	95.8%	94.3%	100.0%	98.6%	Developmental and epileptic encephalopathy 83, 618744
VPS11	100.0%	100.0%	100.0%	99.8%	?Dystonia 32, 619637;Leukodystrophy, hypomyelinating, 12, 616683
VPS53	100.0%	100.0%	100.0%	99.7%	Pontocerebellar hypoplasia, type 2E, 615851
WDR26	100.0%	100.0%	100.0%	98.0%	Skraban-Deardorff syndrome, 617616
WDR45	100.0%	100.0%	99.7%	84.2%	Neurodegeneration with brain iron accumulation 5, 300894

WFS1	100.0%	100.0%	100.0%	99.9%	Deafness, autosomal dominant 6/14/38, 600965;?Cataract 41, 116400;Wolfram-like syndrome, autosomal dominant, 614296;{Diabetes mellitus, noninsulin-dependent, association with}, 125853;Wolfram syndrome 1, 222300
WWOX	100.0%	100.0%	100.0%	99.7%	Esophageal squamous cell carcinoma, somatic, 133239;Developmental and epileptic encephalopathy 28, 616211;Spinocerebellar ataxia, autosomal recessive 12, 614322
XK	100.0%	99.9%	99.1%	76.5%	McLeod syndrome with or without chronic granulomatous disease, 300842
YWHAG	100.0%	100.0%	100.0%	99.8%	Developmental and epileptic encephalopathy 56, 617665
ZEB2	96.8%	96.7%	100.0%	99.3%	Mowat-Wilson syndrome, 235730

Gene symbols used follow HGCN guidelines: Gray KA, Yates B, Seal RL, Wright MW, Bruford EA. *Nucleic Acids Res.* 2015 Jan 43(Database issue):D1079-85.

TWIST X2 Covered 10x describes the percentage of a gene's coding sequence that is covered at least 10x when analyzed by WES using TWIST X2 chemistry.

TWIST X2 Covered 20x describes the percentage of a gene's coding sequence that is covered at least 20x when analyzed by WES using TWIST X2 chemistry.

srWGS GRCh38 Covered 10x describes the percentage of a gene's coding sequence that is covered at least 10x when analyzed by WGS mapped against GRCh38.

srWGS GRCh38 Covered 20x describes the percentage of a gene's coding sequence that is covered at least 20x when analyzed by WGS mapped against GRCh38.

non-protein coding genes are covered, but as coverage statistics are based on protein coding regions, statistics could not be generated.

OMIM release used for OMIM disease identifiers and descriptions : March 17th, 2023.

This list is accurate for panel version DG 3.7.0.