EPILEPSY

- Childhood Epilepsy
- Brain Malformation
- Progressive Myoclonic Epilepsy

1 in 10 cases of epilepsy is believed to be hereditary.

A clear diagnosis is the first step.

Amplexa Genetics®

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Epilepsy – a genetic perspective

Epilepsy is a rather frequent neurological disorder with 1 in 100 affected. Approximately 10% of these will have a genetic background.

Epilepsy is a disorder resulting from surges of electrical signals in the brain, causing recurring seizures. Seizure symptoms vary. Some people with epilepsy simply stare blankly for a few seconds during a seizure, while others have full-fledged convulsions.

About 2 in 100 people in experience an unprovoked seizure once in life. However, a solitary seizure is not indicative of epilepsy. At least two unprovoked seizures are generally required for an epilepsy diagnosis.

When to test?

You should consider genetic testing if your patient has experienced two or more seizures. A seizure can take several forms:

- Temporary confusion
- A staring spell
- Uncontrollable jerking movements of arms and legs
- loss of consciousness or awareness

Seizures can be classified as either focal or generalized each has several subgroupings dependent on the etiology.

Progressive Myoclonic Epilepsy Panel (PME11)

The table below shows the genes included in this panel.

Gene/Locus	Gene/Locus MIM number	Phenotype MIM number	Phenotype
CSTB	601145	254800	ULD
NHLRC1	608072	254780	Lafora
EPM2A	607566	254780	Lafora
SCARB2	602257	254900	PME
GOSR2	604027	614018	PME
PRICKLE1	608500	612437	PME
PRICKLE2	608501	612437	PME
KCTD7	611725		PME
COL6A2	120240		PME
CERS1	606919		PME
CERS2	606920		PME

List of abbreviations: Lafora: Lafora Disease;
PME: Progressive Myoclonic Epilepsy; ULD: Myoclonic epilepsy of Unverricht and Lundborg

Childhood Epilepsy Panel (CHE43)

The table below shows the genes included in this panel.

Gene/Locus	Gene/Locus MIM number	Phenotype MIM number	Phenotype
PRRT2	614386	602066	PKD, PKD+BFIS, BFIS
PNPO	603287	610090	Pyridoxine-dependent epilepsy
ALDH7A1	107323	266100	Pyridoxine-dependent epilepsy
KCNQ3	602232	121201	BFNC
KCNQ2	602235	613720	BFNC, EE
SCN2A	182390	613721	BFNC, EE
CDKL5	300203	300672	EE
KCTD7	611725	611726	EE
ARHGEF9	300429	300607	EE
CHD2	602119	615369	EE
SYNGAP1	603384	612621	EE
MBD5	611472	156200	EE
STXBP1	602926	612164	EE
SCN8A	600702	614558	EE
ALG13	300776	300884	EE
HNRNPU	602869		EE
GNAO1	139311	615473	EE
SLC25A22	609302	609304	EE
SLC35A3	605632	615553	EE
IQSEC2	300522	309530	EE
GRIN1	138249	614254	EE

Gene/Locus	Gene/Locus MIM number	Phenotype MIM number	Phenotype
HDAC4	605314	600430	EE
GABBR1	603540		EE
GABBR2	607340	188890	EE
DNM1	602377		EE
HCN1	602780		EE
GABRB3	137192	612269	EE, FS, GEFS+
TBC1D24	613577	615338	EE, MMPSI
PLCB1	607120	613722	MMPSI
SCN1A	182389	607208	Dravet, GEFS+ MMPSI
SCN1B	600235	604233	Dravet, GEFS+
GABRD	137163	613060	Dravet, GEFS+
GABRG2	137164	611277	Dravet, GEFS+
GABRA1	137160	611136	Dravet
PCDH19	300460	300088	EFMR
SLC2A1	138140	614847	EOAE, GGE, PED
GRIN2A	138253	245570	Focal epilepsy, ESES
KCNT1	608167	614959	Focal epilepsy, ADNFLE, MMPSI
LGI1	604619	600512	Focal epilepsy, ADLTE
DEPDC5	614191		Focal epilepsy, FFEVF
GRIN2B	138252	613970	West, focal epilepsy
SPTAN1	182810	613477	West
CPA6	609562	614417	FFE

Abbreviations for Childhood Epilepsy Panel (CHE40):

ADLTE: Autosomal Dominant Lateral Temporal lobe Epilepsy
ADNFLE: Autosomal Dominant Nocturnal Frontal lobe Epilepsy
BFIS: Benign Familial Infantile Seizures
BFNC: Benign Familial Neonatal Convulsions
EE: Epileptic Encephalopathy
EFMR: Epilepsy with Mental Retardation limited to Females
EOAE: Early Onset Absence Epilepsy
ESES: Electrical Status Epilepticus during Sleep
FFEVF: Familial Focal Epilepsy with Variable Foci
GEFS+: Genetic Generalized Epilepsy with Febrile Seizures plus
GGE: Genetic Generalized Epilepsy
ICCA: PKD combined with infantile seizures
MMPSI: Malignant Migrating Partial Seizures of Infancy
PED: Paroxysmal Exertional Dyskinesia
PKD: Paroxysmal Kinesigenic Dyskinesia

Brain Malformation Panel (BMF40)

The table below shows the genes included in this panel.

Gene/Locus	Gene/Locus MIM number	Phenotype MIM number	Phenotype
FLNA	300017	300049	Periventricular nodular heterotopia
PAFAH1B1	601545	607432	Lissencephaly
DCX	300121	300067	Lissencephaly, double cortex
TUBA1A	602529	611603	Lissencephaly
MEF2C	600662	613443	Microcephaly, agenesis of the corpus callosum
ARX	300382	308350	Lissencephaly
VLDLR	192977	224050	Lissencephaly
ARFGEF2	605371	608097	Periventricular nodular heterotopia
RELN	600514	257320	Lissencephaly with cerebellar hypoplasia
DYRK1A	600855	614104	Severe microcephaly
TUBB2B	612850	610031	Polymicrogyria, symmetric or asymmetric
TUBG1	191135	615412	Cortical dysplasia, complex, with other brain malformations
DYNC1H1	600112	614563	Pachygyria
KIF2A	602591	615411	Pachygyria, severe congenital microcephaly
KIF5C	604593	615282	Severe microcephaly with other brain malformations
GPR56	604110	606854	Polymicrogyria
COL4A1	120130	175780	Porencephaly 1
EMX2	600035	269160	Schizencephaly
WDR62	613583	604317	Microcephaly with or without cortical malformations
EOMES	604615		Microcephaly
TUBA8	605742	613180	Polymicrogyria with optic nerve hypoplasia

Gene/Locus	Gene/Locus MIM number	Phenotype MIM number	Phenotype
TUBB3	602661	614039	Cortical dysplasia, complex, with other brain malformations
IER3IP1	609382	614231	Microcephaly with simplified gyration
PAX6	607108	106210	Polymicrogyria
PIK3R2	603157	603387	Megalencephaly-polymicrogyria-polydactyly-hydrocephalus syndrome
PIK3CA	171834		Hemimegalencephaly
AKT3	611223	603387	Megalencephaly-polymicrogyria-polydactyly-hydrocephalus syndrome
OCLN	602876		Band-like calcification with simplified gyration and polymicrogyria
ZEB2	605802	235730	Mowat-Wilson syndrome
SRPX2	300642	300643	Bilateral perisylvian polymicrogyria
HESX1	601802	182230	Septooptic dysplasia
SHH	600725	142945	Holoprosencephaly
SIX3	603714	157170	Holoprosencephaly
ZIC2	603073	609637	Holoprosencephaly
TGIF	602630	142946	Holoprosencephaly
C6orf70	615532	615544	Periventricular nodular heterotopia
MBD5	156200	156200	Microcephaly
MTOR	601231		Hemimegalencephaly
TBC1D24	613577	615338	Cortical malformations
NDE1	609449	614019	Lissencephaly 4

Why use a genetic test?

A genetic test is useful for both the medical doctor (MD) and the patient! It is a win-win.

As MD you can use a genetic test to confirm the suspected diagnosis, making it possible to formulate a clear personal care plan for your patient. If a genetic test does not confirm your suspected diagnosis, you can wholeheartedly focus your efforts in another direction without detriment to the patient.

A diagnosis helps the patient by providing piece of mind by answering the question "what's wrong with me". A diagnosis helps define the best path forward for the patient and the family, with the possibility for significant improvement of health and quality of life for all affected.

Accreditation Pending under ISO 15189 Medical Laboratories.
Amplexa Genetics is part of the European Molecular Genetics Quality Network (EMQN) quality assessment schemes for mutation scanning and sequencing (External Quality Assessment - EQA).

Why use Amplexa Genetics?

Amplexa Genetics is a front-runner. Founded in 2006, Amplexa Genetics is one of the oldest private clinical genetics laboratories in the world! Amplexa Genetics is close to celebrating 10th anniversary in a field only slightly older than a decade – we know what we are talking about!

Amplexa Genetics uses state of the art Next Generation Sequencing (NGS) technology running disease panels co-developed with researchers who are leading experts in their respective fields.

Skilled researchers totaling more than forty years of experience in genetics and genetic analysis.

Amplexa Genetics provides results in an easy-to read-report, which will help you help your patient.

Amplexa Genetics is committed to delivering:

- High quality analysis and clinical genetic reports.
- Competitive pricing.
- Competitive turnaround time.

How to order a test?

For information on how to order a test for your patient, prices, turnaround time etc., contact Amplexa Genetics - Email: info@amplexa.com, telephone: +45 66 11 66 28 or visit our website: www.amplexa.com.

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