Supplementary table 1: A list of each family in the study showing phenotypes, mutations identified and pathogenicity of each mutation. Key to abbreviations: DD=developmental delay, ID=intellectual disability, GUS=gene of uncertain significance, VOUS=variant of uncertain significance, M=male, F=female.

Family	Gender	Phenotypes	Genes with DNM	Mutation pathogenicity
Fam1	M	Severe DD, absent speech, generalized epilepsy, encephalopathy, hypotonia, dystonia/dyskinesia, macrocephaly, cerebral atrophy,white matter abnormalities, ventriculomegaly	*ADSL* (recessive)*	ADSL: Pathogenic
Fam2	F	Severe ID, epilepsy, hypotonia, psychomotor delay, absent speech, unilateral dysplasia of extarnal ear, unilateral exernal auditory canal atresia, unilateral deafness, high forehead, strabismus, flat nose,small feet	*CDKL5*	Pathogenic
Fam3	M	Global DD, infantile spasms, hypsarrhythmia, bilateral multifocal epileptiform discharges, generalized tonic-clinic seizures, absent speech, hypotonia, inability to walk, hyperopia, astigmatism, thin corpus callosum, diffuse white matter abnormalities	*KCNQ2*	Pathogenic
Fam4	M	Severe ID, autism, atypical absence seizures, atonic seizures, myoclonic absences, generalizied tonic clonic seizures , no speech, ataxic gait, almond shaped eys, full lips, narrow palate	*SYNGAP1*	Pathogenic
Fam5	M	Mild DD, myoclonic seizures, fever induzed sizures, slightly delayed motor development, delayed speech, flat face, congenital nystagmus, strabismus, hypertelorism, long philtrum, bilateral retentio testis, long second toe	*SETD5, ERC2, TMOD2*	SETD5: Pathogenic
Fam6	F	Psychomotor DD, generalized epilepsy, delayed speech development, encephalopathy	*KIAA1244, SMC1A, TBC1D4*	SMC1A: Pathogenic
Fam7	F	Moderate ID, autism, atypical absence seizures that developed to atonic seizures and eventually generalized tonic clonic seizures, microcephaly, thin corpus callosum, feeding difficulties since infacy,growth retardation, low hairline, synophrys, hypertelorism, bulbous nose tip, micrognathia, small ears, fith toe clinodactyly, tapered feet and toes, supratentorial wide ventricles, thin corpus callosum	*EFTUD2, ZMYND11*	EFTUD2: Likely pathogenic, ZMYND11: Pathogenic
Fam8	F	Mild ID, initally fever induced epilepsy, generalized tonic clonic seizures, hyperactivity, only speaks a few words, microcephaly, valgus feet, hypertelorism, asymmetric facial features , large maxilla, strabismus	*GABRG2, AAAS*	GABRG2: Likely pathogenic, AAAS: Variant of unknown clinical significance**
Fam9	M	Mild ID, drug resitent epilepsy, mild left sided hemiparesis	*GRIN1*	Likely pathogenic
Fam10	M	Mild ID, autism, epilepsy, delayed speech development	*SCN2A*	Likely pathogenic

Fam11	F	Mild ID, delayed speech development, focal seizures, mild fever induced epilepsy, cold induced asthma, mild hypotonia, deep set eyes,abnormal shape of palpebral fissures, broad nasal bridge, broad nasal ridge, retracted columella, thin upper lip vermillion, broad chin, widely spaced nipples, teratoma in infancy	*ST5*	Likely pathogenic
Fam12	M	ID, epilepsy, ataxia	*KCNA1*	VOUS
Fam13	M	ID, autism, absence seizures, hyperactivity, neuronal migration disorder, dysmorphic features, hypotonia, cardiomyopathy	*SLCO2A1*	VOUS
Fam14	F	ID, epilepsy, pain sensitivity, Arnold-Chiari malformation, bulging forehead, low set ears, strabismus, curly hair, macrocephaly, scoliosis, short stature	*CERS1*	VOUS**
Fam15	F	ID, severe epilepsy	*CHRDL1*	VOUS**
Fam16	F	Autism, DD, generalized epilepsy, hyperactive, albinism, valgus feet deformity	*MED12*	VOUS**
Fam17	M	ID, epilepsy, cryptorchidism	*A4GALT*	GUS
Fam18	M	ID, epilepsy	*AGTR1*	GUS
Fam19	M	Severe ID, autism, primary generalized epilepsy, ataxic gait, hypermobility, hypotonia, hypoplastic distal phalanges of fingers and toes, cumbered nail beds,short broad thumbs, widely spaced nipples, cryptorchidism, narrow and high-arched palate, small and triangular mouth	*BAZ1A*	GUS
Fam20	M	ID, epilepsy	*C1orf116*	GUS
Fam21	M	Severe DD, absent speech, generalized epilepsy, encephalopathy, hypotonia, dystonia/dyskinesia, macrocephaly, cerebral atrophy,white matter abnormalities, ventriculomegaly	*HECW2*	GUS
Fam22	M	ID, generalized epilepsy, myoclonia	*PAN2*	GUS
Fam23	F	Severe epilepsy, status epilepticus, absent speech, hypertelorism, small and short nose, bulbous nose tip	*POLN*	GUS

* Inherited pathogenic mutation ** Inheritance model does n
GUS=gene of uncertain significance, VOUS=variant of unce