Supplementary table 3: Key genetic developmental epileptic encephalopathies and potential precision therapies (23,24).

Gene	Phenotype	EEG	Potential treatment
KCNQ2	Early onset focal tonic seizures and encephalopathy. Seizures often remit in early childhood. Most have severe intellectual disability	Multiple epileptiform abnormalities with burst suppression.	Sodium channel blockers (carbamazepine, phenytoin) (28). Ezogabine (29).
SCN2A	Spectrum (benign familial neonatal-infantile epilepsy to neonatal onset epileptic encephalopathy). EEG may show burst suppression. Severe intellectual disability, axial hypotonia, microcephaly +/- movement disorder.	Burst suppression or multifocal spikes.	Potential benefit of sodium channel blockers (carbamazepine, phenytoin) (30)
CDKL5	X-linked. Mostly females affected. Median onset 6 weeks. Initially tonic seizures and hypotonia. Seizures progress in phases 1. Hyper-motor evolving to 2. tonic and then 3. extensor spasms. Myoclonic seizures may develop with time. Motor and cognitive impairment with feeding and sleep difficulties.	Initial interictal EEG may be normal. Subsequent deterioration of background. Phased changes in fronto-central regions follow the 3 phases of semiology.	No specific evidence based treatment.
KCNT1	Epilepsy of infancy with migrating focal seizures (EIMFS). Seizures evolve over time. Initial focal seizures +/- autonomic symptoms, clusters within first months of	Multifocal paroxysmal abnormalities alternating between hemispheres with multiple prolonged seizures evolving simultaneously from different areas.	Reports of efficacy of Keppra, quinidine and potassium bromide (31, 32)

	life. Seizures less frequent after 1-5 years but there is severe developmental disability.		
STXBP1	Focal motor/tonic spasms <3months. Normal head circumference. Moderate to severe developmental difficulties. Some will develop an ataxic gait and movement disorder.	Burst suppression/multifocal abnormalities.	No specific evidence based treatment
SCN1A	Dravet syndrome: prolonged and recurrent febrile seizures <1year, generalized and focal seizures. Initially normal development but the majority will go onto develop marked developmental disability.	Inter-ictal EEG is often normal <1year. Later EEG is heterogeneous but may show generalized spike and wave changes with multifocal discharges.	Sodium valproate, stiripentol, clobazam, Levetiracetam, topiramate, Fenfluramine, CBD (33, 34) Avoid: Phenytoin, carbamazepine, oxcarbazepine, lamotrigine, rufinamide
ARX	Range on conditions: Early infantile encephalopathy1: Onset of seizures <1year, including infantile spasms. Intellectual disability *Partington syndrome (intellectual disability and focal dystonia), X*	Hypsarrhythmia	Steroids and vigabatrin (please see international collaborative infantile spams study ICISS for guidance). (35)

	linked lissencephaly with abnormal genitalia and *Proud syndrome (agenesis of corpus collosum, seizures, spasticity, abnormal genitalia)*		
CHD2	Infantile to childhood onset epilepsy with multiple seizures types (particularly drop attacks and eyelid myoclonia). Neurodevelopmental difficulties.	Background of generalised slow epileptiform activity with or without photosensitivity.	Previous reports of good responses to Sodium valproate, Lamotrigine, Phenytoin with mixed reports of response to ketogenic diet.
GRIN2A	Broad phenotype intellectual disability, speech disorder, focal epilepsy with centro-temporal spikes, epileptic encephalopathy	variable	Memantine, MPX-004 and MPX-007 (research only) (36)
GRIN2B	Mild to profound developmental delay, hyper/hypotonia, movement disorder, possible microcephally.	Hypsarrhythmia, focal/multifocal/generalised epileptiform activity.	Radiprodil (in vitro evidence/research based) (37)
GABRB3	EIEE43: Multiple seizure types (absence, myoclonic, generalised tonic-clonic and infantile spasms) in the first year of life, intellectual disability, autism, neurodevelopmental delay.	Variable (includes hypsarrhythmia, modified burst suppression, generalised 2Hz bursts, multifocal discharges)	Vinpocetine (38, 39)
CHRNA4	Autosomal dominant sleep related hypermotor epilepsy (ADSHE)	Clusters of seizures with frontal semiology/origin.	Nicotine (40)