PCDH19-related X-linked Female-Limited Epilepsy with Mental Retardation: PCDH19 Gene Deletion/Duplication

Test Code: DPC19
Turnaround time: 2 weeks
CPT Codes: 81228 x1

Condition Description

Mutations in the PCDH19 gene (Xq22) (OMIM#: 300460) have been associated with epileptic encephalopathy, early infantile, 9 (OMIM #: 300088). In the original report, 15 related female patients had a grand mal convulsive disorder associated with intellectual disability. The reported age of onset varied from 4 to 18 months of age. Early symptoms included partial and generalized convulsions that were associated with developmental regression. The frequency of seizures was reported to decline at age of 2 but cognitive impairment was prominent in the affected females.

Other features reported in this family and other unrelated affected families include variable intellectual disability, neuropsychiatric disorders including autism and schizophrenia, purposeless hand movements, poor language development, and ataxia. Some obligate carrier males have been reported to display obsessive traits and interests.

One study identified PCDH19 mutations in 11 of 45 (24.4%) unrelated females with epileptic encephalopathy of infancy who were negative for mutations in the SCNIA Gene. Another study found PCDH19 mutations in 2 of 86 (2.3%) females with epilepsy with or without intellectual disability. A third study identified PCDH19 mutations in 13 of 117 (11%) females with febrile seizures and epilepsy.

For patients with suspected X-Linked Epilepsy with MR, sequence analysis is recommended as the first step in mutation identification. For patients in whom mutations are not identified by full gene sequencing, deletion/duplication analysis is appropriate.

References:
- OMIM# 300460: PCDH19 gene
- OMIM# 300088: X-Linked Epilepsy with MR

Genes

PCDH19

Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of X-Linked Epilepsy with MR in an individual in whom sequence analysis was negative.
- Carrier testing in adults with a family history of X-Linked Epilepsy with MR in whom sequence analysis was negative.

Methodology

DNA isolated from peripheral blood is hybridized to a CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes which cover the entire genomic region.

Detection

Detection is limited to duplications and deletions. The CGH array will not detect point or intronic mutations. Results of molecular analysis must be interpreted in the context of the patient's clinical and/or biochemical phenotype.

Specimen Requirements

Submit only 1 of the following specimen types

Type: Whole Blood (EDTA)

- **Specimen Requirements:**
  - EDTA (Purple Top)
    - Infants and Young Children (≤2 years of age to 10 years old): 3-5 ml
    - Older Children & Adults: 5-10 ml
  - Autopsy: 2-3 ml unclotted cord or cardiac blood

- **Specimen Collection and Shipping:**
  - Ship sample at room temperature for receipt at EGL within 72 hours of collection. Do not freeze.

Type: DNA, Isolated

- **Specimen Requirements:**
  - Microtainer
  - 3µg
Isolation using the Perkin Elmer™Chemagen™ Chemagen™ Automated Extraction method or Qiagen™ Puregene kit for DNA extraction is recommended.

**Specimen Collection and Shipping:**
Refrigerate until time of shipment in 100 ng/µL in TE buffer. Ship sample at room temperature with overnight delivery.

### Related Tests

- Sequence analysis of the *PCDH19* gene is available and is required before deletion/duplication analysis.
- Custom diagnostic mutation analysis (KM) is available to family members if mutations are identified by targeted mutation testing or sequencing analysis.
- Prenatal testing is available only for known familial mutations to individuals who are confirmed carriers of mutations. Please contact the laboratory genetic counselor to discuss appropriate testing prior to collecting a prenatal specimen.
- X-Linked Intellectual Disability panels are available for 30, 60, and 90 genes.