A mutation in the SYN1 gene (Xp11.4-p11.2) has been described in members of a family with epilepsy, variable learning disabilities, and behavior disorders. Some of the affected males were of normal intelligence with epilepsy only and others had various combinations of epilepsy, learning difficulties, macrocephaly, and aggressive behavior. The natural history of the epilepsy was variable. Some individuals had episodes only during childhood, others developed epilepsy later in life, and others had epilepsy only in association with specific stimuli.

The SYN1 gene encodes the synapsin I protein, a synaptic vesicle associated protein involved in the regulation of neurotransmitter release.

For patients with suspected X-linked epilepsy with variable learning disabilities and behavior disorders, 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 #300497: Epilepsy, X-Linked, with variable learning disabilities and behavior disorders.
- OMIM #313440: Synapsin I.

**Genes**

**SYN1**

**Indications**

This test is indicated for:

- Confirmation of a clinical diagnosis of X-linked epilepsy with variable learning disabilities and behavior disorders in an individual in whom sequence analysis was negative.
- Carrier testing in adults with a family history of X-linked epilepsy with variable learning disabilities and behavior disorders 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: 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.

**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.

Special Instructions
Submit copies of diagnostic biochemical test results with the sample, if appropriate. Contact the laboratory if further information is needed.

Sequence analysis is required before deletion/duplication analysis by targeted CGH array. If sequencing is performed outside of EGL Genetics, please submit a copy of the sequencing report with the test requisition.

Related Tests
- Sequence analysis of the SYN1 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.