**SCN1A-related Disorders: SCN1A Gene Deletion/Duplication**

**Test Code:** DSCN1  
**Turnaround time:** 2 weeks  
**CPT Codes:** 81228 x1

### Condition Description

**SCN1A-Related Seizure Disorders**  
SCN1A-related seizure disorders are a spectrum that range from simple febrile seizures at the mild end to Dravet syndrome and intractable childhood epilepsy with generalized tonic-clonic seizures that are the severe end. A clinical diagnosis of SCN1A-related seizures disorders is difficult because the phenotypes range on a spectrum, even within the same family and many other conditions have epilepsy as a feature. Therefore, a diagnosis relies on molecular testing of the SCN1A gene (2q24). Sequencing of the SCN1A gene detects 73%-92% of mutations. Deletion/duplication analysis of the SCN1A gene detects 8-27% of mutations. Mutations are inherited in an autosomal dominant manner. Phenotypes that are commonly associated with SCN1A-related seizure disorders include febrile seizures (FS), generalized epilepsy with febrile seizures plus (GEFS+), Dravet syndrome, severe myoclonic epilepsy, borderline (SMEB), intractable childhood epilepsy with generalized tonic-clonic seizures (ICE-GTC), and infantile partial seizures with variable foci. Clinical features associated with SCN1A-related seizure disorders include one or more family members with epilepsy, especially if the epilepsy is of more than one type, febrile seizures, a history of seizures after vaccination, hemiconvulsive seizures, and seizures triggered by environmental factors. SCN1A-related seizure disorders show incomplete penetrance and variable expressivity.

**Familial Hemiplegic Migraine**  
Familial Hemiplegic Migraine (FHM) is in the category of migraine with aura. Clinical diagnostic criteria of FHM include migraine with aura, some degree of hemiparesis, and at least one first-degree relative has identical attacks. Three genes are known to be associated with FHM; CACNA1A (FHM1), ATP1A2 (FHM2), and SCN1A (FHM3). Please note that this test is only for the SCN1A gene.

### References:

- GeneReviews  
- OMIM #182389: SCN1A gene  
- OMIM #609634: Familial Hemiplegic Migraine  
- OMIM #607208: Dravet syndrome  
- OMIM #604403 and 604233: GEFS+

### Genes

**SCN1A**

### Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of SCN1A-related disorders in an individual in whom sequence analysis was negative.  
- Carrier testing in adults with a family history of SCN1A-related 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**

Sequencing of the SCN1A gene detects 73%-92% of mutations for SCN1A-related seizure disorders. Deletion/duplication analysis of the SCN1A gene detects 8-27% of mutations for SCN1A-related seizure disorders.

### 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

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Specimen Requirements:
Microtainer
3µg
Isolation using the Perkin Elmer™/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.

Special Instructions
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 SCN1A 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.