Glucose Transporter Type 1 Deficiency Syndrome: SLC2A1 Gene Deletion/Duplication

Test Code: DSQLC2
Turnaround time: 2 weeks
CPT Codes: 81228 x1

Condition Description

Glucose transporter type 1 deficiency syndrome (Glut-1-DS) is characterized by infantile seizures that are resistant to treatment by anticonvulsants. This is followed by delays in mental and motor development, head growth retardation, ataxia, dysarthria, spasticity, and uncontrolled eye movement before meals. The most important laboratory observation in Glut-1-DS is a reduced cerebrospinal fluid glucose concentration. Affected infants appear normal at birth. Seizures typically begin between one and four months of age. The frequency, type, and severity of seizures vary among individuals with Glut-1-DS. Additionally, cognitive impairment can range from learning difficulties to severe intellectual disability.

Mutation of the SLC2A1 (1p35-p31.3) gene cause Glut-1-DS. Glut-1-DS is inherited in an autosomal dominant manner with the majority of mutations occurring de novo. Affected parents have been reported with a mild or subclinical degree of impairment.

For patients with suspected Glut-1-DS, 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:
- GeneReviews
  - OMIM #138140: SLC2A1 gene
  - OMIM #606777: Glut-1-DS

Genes

SLC2A1

Indications

This test is indicated for:
- Confirmation of a clinical diagnosis of Glucose Transporter Type 1 Deficiency syndrome in an individual in whom sequence analysis was negative.
- Carrier testing in adults with a family history of Glucose Transporter Type 1 Deficiency syndrome 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.

Please note that a “backbone” of probes across the entire genome are included on the array for analytical and quality control purposes. Rarely, off-target copy number variants causative of disease may be identified that may or may not be related to the patient's phenotype. Only known pathogenic off-target copy number variants will be reported. Off-target copy number variants of unknown clinical significance will not be reported.

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

* Preferred specimen type: Whole Blood

Type: Whole Blood

Specimen Requirements:

In EDTA (purple top) tube:
- Infants (2 years): 3-5 ml
- Older Children & Adults: 5-10 ml

Specimen Collection and Shipping: Refrigerate until time of shipment. Ship sample within 5 days of collection at room temperature with overnight delivery.

Type: Saliva
Specimen Requirements:

Oragene™ Saliva Collection kit (available through EGL) used according to manufacturer instructions.

Specimen Collection and Shipping: Store sample at room temperature. Ship sample within 5 days of collection 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 \textit{SLC2A1} 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.