

Sialidosis: *NEU1* Gene Sequencing

Test Code: SNEU1

Turnaround time: 4 weeks

CPT Codes: 81479 x1

Condition Description

Sialidosis, also known as neuraminidase deficiency or mucopolidosis type I, is an autosomal recessive lysosomal storage disorder. It is the result of a lysosomal deficiency of sialidase (alpha-N-acetyl neuraminidase) causing the accumulation of sialyloligosaccharides in tissues.

While sialidosis is a spectrum and the phenotype varies in clinical onset and severity, two distinct types have been described. Sialidosis type 1 is on the milder end of the spectrum. Onset typically occurs in the second decade and is characterized by progressive loss of vision associated with nystagmus, ataxia, macular cherry-red spots and seizures; but not dysmorphic features. Sialidosis type 2 is on the severe end of the spectrum. It is characterized by dysmorphic features, intellectual disability, developmental delays, macular cherry-red spots, hepatosplenomegaly, dysostosis multiplex, and coarse facies. The age of onset distinguishes the subtypes: congenital or hydropic, infantile (0-12 months), or juvenile (2-20 years). Hydrops fetalis can manifest in the congenital/hydropic subtype.

Mutations in the *NEU1* gene (6p21.33) cause sialidosis. Sequence analysis of the entire *NEU1* gene coding region is available for individuals suspected of having sialidosis and their at-risk relatives on a clinical basis.

References:

- Bonten *et al.* (2000), *Hum Mol Genet*, 9:2715-2725.
- Pattison *et al.* (2004), *Hum Mutat*, 23:32-39.
- [OMIM #256550](#): Neuraminidase deficiency
- [OMIM #608272](#): *NEU1* gene

Genes

[NEU1](#)

Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of sialidosis.
- Carrier testing in adults with a family history of sialidosis.

Methodology

PCR amplification of 6 exons contained in the *NEU1* gene is performed on the patient's genomic DNA. Direct sequencing of amplification products is performed in both forward and reverse directions, using automated fluorescence dideoxy sequencing methods. The patient's gene sequences are then compared to a normal reference sequence. Sequence variations are classified as mutations, benign variants unrelated to disease, or variations of unknown clinical significance. Variants of unknown clinical significance may require further studies of the patient and/or family members. This assay does not interrogate the promoter region, deep intronic regions, or other regulatory elements, and does not detect large deletions.

Detection

Clinical Sensitivity: Unknown. Mutations in the promoter region, some mutations in the introns and other regulatory element mutations cannot be detected by this analysis. Large deletions will not be detected by this analysis. Results of molecular analysis should be interpreted in the context of the patient's clinical and/or biochemical phenotype.

Analytical Sensitivity: ~99%

Specimen Requirements

Submit only 1 of the following specimen types

Type: DNA, Isolated

Specimen Requirements:

Microtainer

8µg

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.

Type: Saliva**Specimen Requirements:**

Oragene™ Saliva Collection Kit

Oragene™ Saliva Collection Kit used according to manufacturer instructions. Please contact EGL for a Saliva Collection Kit for patients that cannot provide a blood sample.

Specimen Collection and Shipping:

Please do not refrigerate or freeze saliva sample. Please store and ship at room temperature.

Special Instructions

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

Related Tests

- Oligosaccharide and Glycan Screening (Test Code: OS) is also available.
- Custom diagnostic mutation analysis (Test Code: KM) is available to family members if mutations are identified by targeted mutation testing or sequencing analysis.
- Prenatal testing is available for known familial mutations only. Please contact the laboratory genetic counselor to discuss appropriate testing prior to collecting a prenatal specimen.