Sialidosis: \textit{NEU1} Gene Sequencing

\textbf{Test Code}: SNEU1  \\
\textbf{Turnaround time}: 4 weeks  \\
\textbf{CPT Codes}: 81479 x1

\begin{center}
\textbf{Condition Description}
\end{center}

Sialidosis, also known as neuraminidase deficiency or mucolipidosis 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 sialylligozesaccharides 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 \textit{NEU1} gene (6p21.33) cause sialidosis. Sequence analysis of the entire \textit{NEU1} gene coding region is available for individuals suspected of having sialidosis and their at-risk relatives on a clinical basis.

\begin{itemize}
\item OMIM \#256550: Neuraminidase deficiency
\item OMIM \#608272: \textit{NEU1} gene
\end{itemize}

\begin{center}
\textbf{Genes}
\end{center}

\textbf{\textit{NEU1}}

\begin{center}
\textbf{Indications}
\end{center}

This test is indicated for:

\begin{itemize}
\item Confirmation of a clinical diagnosis of sialidosis.
\item Carrier testing in adults with a family history of sialidosis.
\end{itemize}

\begin{center}
\textbf{Methodology}
\end{center}

PCR amplification of 6 exons contained in the \textit{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.

\begin{center}
\textbf{Detection}
\end{center}

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%

\begin{center}
\textbf{Specimen Requirements}
\end{center}

Submit only 1 of the following specimen types

\begin{itemize}
\item * Preferred specimen type: Whole Blood
\end{itemize}

\begin{center}
\textbf{Type: Whole Blood}
\end{center}

Specimen Requirements:

In EDTA (purple top) or ACD (yellow 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**

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.