Succinyl-CoA, 3-Oxoacid CoA Transferase (SCOT) Deficiency: OXCT1 Gene Sequencing

Condition Description

Succinyl-CoA:3-oxoacid CoA transferase (SCOT) deficiency causes episodic ketoacidosis without symptoms between episodes. Persistent ketoacidosis and ketonuria are characteristic of the disease, but may be absent in some affected individuals. Almost half of individuals with SCOT deficiency will develop the first ketoacidotic crisis at the age of 2-4 days. Affected individuals are generally physically and developmentally normal.

No diagnostic metabolites are observed in the blood and urine sample from SCOT-deficient individuals, in contrast to most organic acidemias. Ketone bodies, acetoacetate, and 3-hydroxybutyrate are, however, elevated. SCOT deficiency is caused by mutations in the OXCT1 gene (5p14). It is inherited in an autosomal recessive manner. SCOT is a mitochondrial homodimer essential for ketone body utilization. Ketone bodies, which are produced in the liver, are an important source of energy for extrahepatic tissues.

References:

- OMIM #245050 SCOT Deficiency.
- OMIM #601424 OXCT1.

Genes

OXCT1

Indications

This test is indicated for:

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

Methodology

Next Generation Sequencing: In-solution hybridization of all coding exons is performed on the patient’s genomic DNA. Although some deep intronic regions may also be analyzed, this assay is not mean to interrogate most promoter regions, deep intronic regions, or other regulatory elements, and does not detect single or multi-exon deletions or duplications. Direct sequencing of the captured regions is performed using next generation sequencing. The patient’s gene sequences are then compared to a standard reference sequence. Potentially causative variants and areas of low coverage are Sanger-sequenced. Sequence variations are classified as pathogenic, likely pathogenic, benign, likely benign, or variants of unknown significance. Variants of unknown significance may require further studies of the patient and/or family members.

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 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 uncotted cord or cardiac blood

Specimen Collection and Shipping:
Ship sample at room temperature for receipt at EGL within 24 hours of collection. Do not refrigerate or freeze.

Type: Saliva

Specimen Requirements:
Oragene™ Saliva Collection Kit
Orangene™ 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
- 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.