The SCO2 gene encodes a protein that is important for regulating the copper level of a cell. It is also required for the proper assembly and function of cytochrome c oxidase (COX, the complex of proteins that form Complex IV of the electron transport chain). The electron transport chain contains five large multi-subunit protein complexes that are important for the generation of energy in the form of ATP. The fourth complex of the electron transport chain, cytochrome c oxidase, is comprised of 13 subunits that are located within the inner mitochondrial membrane. Three of these subunits, which form the catalytic core of the complex, are encoded by mitochondrial DNA, while the remaining ten subunits are encoded by nuclear DNA. This complex cannot assemble correctly without SCO2. Mutations in the SCO2 gene product are one cause of Leigh syndrome. Mutations in SCO2 have been identified in patients with fatal, infantile hypertrophic cardiomyopathy with encephalopathy. The mutations are autosomal recessive and include nonsense, missense, and small duplication mutations. The SCO2 gene contains 2 exons and is located at chromosome 22q13.33.

Clinically, patients with SCO2 mutations commonly present in infancy. Common symptoms include rapidly progressive hypertrophic cardiomyopathy, hypotonia, stridor and/or respiratory distress, and mild to moderate lactic acidosis. Seizures, strabismus, or ptosis may be present along with failure to thrive. A spinal muscular atrophy-like phenotype has been described. COX activity is generally decreased or absent by histochemical staining or electron transport chain analysis, but this is not an invariable finding. Children usually die within the first year of life. In patients with COX deficiency, mutations in SCO2 account for approximately 5% of cases.

Indication
Molecular confirmation of the diagnosis of severe infantile hypertrophic cardiomyopathy and/or encephalopathy resulting from SCO2 mutations.
Exon 2, the only protein coding exon of the SCO2 gene, as well as the exon/intron boundaries and a portion of untranslated regions of the gene are amplified by PCR. Genomic DNA sequences from both forward and reverse directions are obtained by automatic fluorescent detection using an ABI PRISM® 3730 DNA Analyzer. Sequence variants different from National Center for Biotechnology Information GenBank references are further evaluated for genetic significance. If a mutation is identified, known familial mutation analysis will be available for additional family members.

Greater than 98.5% of the mutations in exon 2 of SCO2 are detectable by sequence based methods. Sequencing does not detect deletions or duplications.


Peripheral blood in EDTA tube
Adult: 5-10mL
Child: 3-5mL
Infant: 1-3mL
For other specimen types, please contact Amy Shikany at 513-803-3317

Full Mutation Analysis 2-4 weeks
Known Mutation Analysis 1-2 weeks

Full Gene Sequencing 81479
Additional Family Members 81403