FASTKD2 MUTATION ANALYSIS
JOHN WELSH CARDIOVASCULAR DIAGNOSTIC LABORATORY

**FASTKD2** (FAST KINASE DOMAIN-CONTAINING PROTEIN 2) encodes a protein that is localized in the mitochondrial inner compartment and that may play a role in mitochondrial apoptosis. Human **FASTKD2** gene contains 11 exons mapped within chromosome 2q33.3. Mutations in the **FASTKD2** gene can cause mitochondrial Complex IV deficiency, characterized by developmental delay, hemiplegia, convulsions, asymmetric brain atrophy, and low cytochrome C oxidase activity in skeletal muscles. It is clinically heterogeneous, ranging from isolated myopathy to severe multisystem disease, with onset from infancy to adulthood. The main clinical features were truncal hypotonia, antenatal and postnatal growth retardation, cardiomyopathy, encephalopathy, and liver failure. Complex I and complex I+IV deficiencies were significantly more frequent in cases of cardiomyopathy and hepatic failure. Definitive genotype/phenotype correlations have not been described.

The John Welsh Cardiovascular Diagnostic Laboratory offers molecular genetic testing for **FASTKD2** mutations. Individuals are tested by automatic fluorescent DNA sequencing of the coding exons of the **FASTKD2** gene. We strongly recommend initial testing of a clearly affected individual, if available, in order to provide the greatest test sensitivity and clearest interpretation of results for subsequent family members. Genetic counseling is recommended for all individuals.

**REASONS FOR REFERRAL**

Molecular confirmation of the diagnosis of CHD and mitochondrial Complex IV deficiency.

**METHODOLOGY**

Genomic DNA is analyzed for **FASTKD2** mutations by DNA sequencing of the coding exons of the **FASTKD2** gene, as well as the exon/intron junctions and a portion of the 5’ and 3’ untranslated region. Patient DNA is sequenced in both the forward and reverse orientations. If a mutation is identified, additional family members are analyzed only for the familial mutation by automatic fluorescent DNA sequencing.

**SERVICE FEES**

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<thead>
<tr>
<th></th>
<th>Direct and Institutional Billing</th>
<th>CPT Codes</th>
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<tbody>
<tr>
<td>Index Case (Male or Female)</td>
<td>$1,000 per sample</td>
<td>81406</td>
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<tr>
<td>Additional Family Members</td>
<td>$300 per sample; known familial mutation only</td>
<td>81403</td>
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**SENSITIVITY**

DNA Sequencing Analysis: Approximately 99 percent detection of mutations in the coding exons 2-12 of **FASTKD2**.

**SPECIMEN REQUIREMENTS**

**Blood (preferred):** EDTA (purple-top) tubes: **Adult:** 5 cc, **Child:** 5 cc, **Infant:** 2-3 cc

**Tissue:** Frozen (preferred), RNAlater

**Other Body Fluids or Formalin-fixed, Paraffin-embedded Tissue:** Call to inquire

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