**FGD1 MUTATION ANALYSIS**

**JOHN WELSH CARDIOVASCULAR DIAGNOSTIC LABORATORY**

*FGD1 (FYVE, RhoGEF, AND PH DOMAIN-CONTAINING PROTEIN 1)* gene encodes a protein that contains Dbl (DH) and pleckstrin (PH) homology domains and is similar to the Rho family of small GTP-binding Proteins. The encoded protein specifically binds to the Rho family GTPase, stimulate the GDP-GTP exchange and lead to c-Jun kinase SAPK/JNK1 activation. FGD1 plays a role in regulating the actin cytoskeleton and cell shape. Human *FGD1* gene contains 18 exons mapped to chromosome Xp11.22. Mutations in the *FGD1* gene can cause Aarskog-Scott syndrome, also known as faciogenital dysplasia, which is an X-linked disorder characterized by short stature, hypertelorism, shawl scrotum, and brachydactyly, cardiac and central nervous system abnormalities and behavioral disorders can also be detected. Definitive genotype/phenotype correlations have not been described.

The John Welsh Cardiovascular Diagnostic Laboratory offers molecular genetic testing for *FGD1* mutations. Individuals are tested by automatic fluorescent DNA sequencing of the coding exons of the *FGD1* 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 diagnosis of CHD and Aarskog-Scott syndrome.

**METHODOLOGY**

Genomic DNA is analyzed for *FGD1* mutations by DNA sequencing of the coding exons of the *FGD1* 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**

<table>
<thead>
<tr>
<th>Description</th>
<th>Direct and Institutional Billing</th>
<th>CPT Codes</th>
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</thead>
<tbody>
<tr>
<td>Index Case (Male or Female)</td>
<td>$1,200 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 1-18 of *FGD1*.

**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