Cardiac muscle myosin is one of the major components of the sarcomere, the building block of the contractile system of cardiac muscle. Cardiac muscle myosin is a hexamer consisting of two heavy chain subunits, two light chain subunits, and two regulatory subunits. The MYH6 (alpha cardiac muscle myosin heavy chain 6) gene encodes the alpha heavy chain subunit of cardiac myosin (alpha-MHC), a fast ATPase primarily expressed in atrial tissue. MYH6 gene contains 37 coding exons and spans 26.3 kb genomic distance on chromosome 14q11.2. Mutations in this gene cause atrial septal defect 3, dilated cardiomyopathy 1EE, familial hypertrophic cardiomyopathy 14 and sick sinus syndrome 3. MYH6 mutations demonstrate autosomal dominant inheritance with a broad range of clinical severity both within and between families. Definitive genotype/phenotype correlations have not been described.

The John Welsh Cardiovascular Diagnostic Laboratory offers molecular genetic testing for MYH6 mutations. Individuals are tested by DNA sequencing of the coding exons of the MYH6 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 atrial septal defect 3, dilated cardiomyopathy 1EE, familial hypertrophic cardiomyopathy 14 and sick sinus syndrome 3.

**METHODOLOGY**

Genomic DNA is analyzed for MYH6 mutations by DNA sequencing of the coding exons of the MYH6 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>
</tr>
</thead>
<tbody>
<tr>
<td>Index Case (Male or Female)</td>
<td>$1,500 per sample</td>
<td>81407</td>
</tr>
<tr>
<td>Additional Family Members</td>
<td>$300 per sample; known familial mutation only</td>
<td>81403</td>
</tr>
</tbody>
</table>

**SENSITIVITY**


**SPECIMEN REQUIREMENTS**

- **Blood** (preferred): EDTA (purple-top) tubes: **Adult**: 5 cc **Child**: 5 cc **Infant**: 2-3 cc
- **Tissue**: Frozen (preferred), RNA later
- **Other Body Fluids and Formalin-fixed, Paraffin-embedded Tissue**: Call to inquire