KCNJ5 MUTATION ANALYSIS
JOHN WELSH CARDIOVASCULAR DIAGNOSTIC LABORATORY

*KCNJ5* (potassium inwardly-rectifying channel, subfamily J, member 5) gene contains two exons spanning 26 kb of genomic distance that was mapped to chromosome 11q24. The protein encoded by this gene is an integral membrane protein controlled by G-proteins and inward-rectifier type potassium channel and has a greater tendency to allow potassium to flow into a cell rather than out of a cell. It may associate with two other G-protein-activated potassium channels to form a heteromultimeric pore-forming complex. Defects in *KCNJ5* are the cause of long QT syndrome type 13 (LQT13) characterized by a prolonged QT interval on the ECG and polymorphic ventricular arrhythmias. Mutations in *KCNJ5* also lead to familial hyperaldosteronism type III. *KCNJ5* 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 *KCNJ5* mutations. Individuals are tested by DNA sequencing of the coding exons of the *KCNJ5* 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 long-QT syndrome type 13 (LQT13) and familial hyperaldosteronism type III.

**METHODOLOGY**

Genomic DNA is analyzed for *KCNJ5* mutations by DNA sequencing of the coding exons of the *KCNJ5* 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>$600 per sample</td>
<td>81404</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 2-3 of *KCNJ5*.

**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 and Formalin-fixed, Paraffin-embedded Tissue: Call to inquire