**DNAI1 MUTATION ANALYSIS**

**JOHN WELSH CARDIOVASCULAR DIAGNOSTIC LABORATORY**

DNAI1 (DYNEIN, AXONEMAL, INTERMEDIATE CHAIN 1) encodes a member of the dynein intermediate chain family. The encoded protein is part of the dynein complex in respiratory cilia, which is responsible for the sliding movement in axonemes, help mediate attachment and may also participate in regulating dynein activity. Human DNAI1 gene contains 20 exons mapped within chromosome 9p13.3. Mutations in the DNAI1 gene can cause abnormal ciliary ultrastructure and function associated with primary ciliary dyskinesia (PCD). PCD is a recessive genetic disorder characterized by sinopulmonary disease and reflects abnormal ciliary structure and function, and there are a few reports of PCD with heterotaxy (situs ambiguous), such as cardiovascular anomalies. The prevalence of congenital heart disease with heterotaxy is 200-fold higher in PCD than in the general population. Definitive genotype/phenotype correlations have not been described.

The John Welsh Cardiovascular Diagnostic Laboratory offers molecular genetic testing for DNAI1 mutations. Individuals are tested by automatic fluorescent DNA sequencing of the coding exons of the DNAI1 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 congenital heart disease (CHD) and primary ciliary dyskinesia (PCD).

**METHODOLOGY**

Genomic DNA is analyzed for DNAI1 mutations by DNA sequencing of the coding exons of the DNAI1 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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<tr>
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<th>Direct and Institutional Billing</th>
<th>CPT Codes</th>
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<tbody>
<tr>
<td>Index Case (Male or Female)</td>
<td>$1,200 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 1-20 of DNAI1 gene.

**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