PAX2 Gene Analysis in Renal-Coloboma Syndrome / Papillorenal Syndrome

**Clinical Features:**
Renal-coloboma syndrome is principally characterized by ocular and renal abnormalities. The PAX2 gene encodes a transcription factor that is expressed in the developing eye, kidney, ear, ureteric bud, and midbrain/hindbrain. Individuals diagnosed with renal-coloboma syndrome present with highly variable clinical manifestations. The most common abnormalities in patients with renal-coloboma syndrome are bilateral optic nerve colobomas and renal hypoplasia with or without renal failure. Patients may also present with auditory abnormalities, urogenital defects causing vesico-ureteral reflux, and central nervous system malformations. The phenotypes among patients can vary both within and between families, and definitive genotype-phenotype correlations have largely been elusive.1-5

**Inheritance Pattern/Genetics:**
Autosomal dominant

**Test Methods:**
Analysis of the PAX2 gene is offered in two tiers. These tiers may be ordered as reflexive testing where Tier 2 will only be completed if Tier 1 is negative or may be ordered concurrently so that Tier 1 and Tier 2 will analyzed simultaneously. Tier 1 will consist of sequence analysis of exon 2 of PAX2 gene, where a large majority of pathogenic variants have been identified. Tier 2 analysis will consist of sequence analysis of the remaining exons of the PAX2 gene (exons 1 and 3-12) not included in Tier 1. Targeted array CGH analysis with exon-level resolution (ExonArrayDx) is also available as a separate test to evaluate for a deletion or duplication of one or more exons of the PAX2 gene. Variants found in the first person of a family to be tested are confirmed by repeat analysis using sequencing, restriction fragment analysis, or another appropriate method.

**Test Sensitivity:**
Variants in the PAX2 gene have been identified in approximately 50% of all patients diagnosed with renal-coloboma syndrome / papillorenal syndrome.1-4 A deletion of the entire PAX2 gene has been reported in one patient.5

**References:**