PAX6-related Disorders: PAX6 Gene Deletion/Duplication

Test Code: DPAX6
Turnaround time: 2 weeks
CPT Codes: 81228 x1

Condition Description

The PAX6 gene (11p13) has been described as a master regulator of eye development and is also reported to influence development of the central nervous system, pancreatic islets, and the pituitary gland. Pathogenic variants in the PAX6 gene cause aniridia and non-aniridia eye disorders.

Aniridia
Aniridia is complete or partial iris hypoplasia. It is associated with foveal hypoplasia and reduced visual acuity. These features present in early infancy. Additional ocular abnormalities that may occur later in life include glaucoma, cataract, and corneal opacification and vascularization. Pathogenic variants within the PAX6 gene only cause isolated aniridia without any systemic involvement. Wilms tumor-aniridia-genital anomalies-retardation (WAGR) syndrome is caused by a larger deletion of 11p13 that includes both the PAX6 and WT1 genes. Isolated aniridia is inherited in an autosomal dominant manner. Haploinsufficiency of the PAX6 gene causes aniridia.

Please note that a chromosomal microarray is the recommended test for detecting the WAGR deletion.

Optic Nerve Malformations
In rare cases, pathogenic variants in the PAX6 gene cause non-aniridia phenotypes that include anterior segment anomalies, congenital cataracts, and foveal hypoplasia. These highly variable ocular phenotypes include Peter’s anomaly, ectopic papillae, and autosomal dominant keratitis.

References:
- GeneReviews
- OMIM #607108: PAX6 gene

Genes

PAX6

Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of a PAX6-related disorder in an individual in whom sequence analysis was negative.
- Carrier testing in adults with a family history of a PAX6-related disorder in whom sequence analysis was negative.

Methodology

DNA isolated from peripheral blood is hybridized to a CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes which cover the entire genomic region.

Please note that a "backbone" of probes across the entire genome are included on the array for analytical and quality control purposes. Rarely, off-target copy number variants causative of disease may be identified that may or may not be related to the patient's phenotype. Only known pathogenic off-target copy number variants will be reported. Off-target copy number variants of unknown clinical significance will not be reported.

Detection

Detection is limited to duplications and deletions. The CGH array will not detect point or intronic mutations. Results of molecular analysis must be interpreted in the context of the patient's clinical and/or biochemical phenotype.

Specimen Requirements

Type: Whole Blood

Specimen Requirements:

In EDTA (purple top) or ACD (yellow top) tube: Infants (2 years): 3-5 ml Older Children & Adults: 5-10 ml
Specimen Collection and Shipping: Store sample at room temperature. Ship sample within 5 days of collection at room temperature with overnight
Type: Saliva

Specimen Requirements:

OrageneTM Saliva Collection kit (available through EGL) used according to manufacturer instructions.

Specimen Collection and Shipping: Please do not refrigerate or freeze saliva sample. Please store and ship at room temperature.

**Special Instructions**

Sequence analysis is required before deletion/duplication analysis by targeted CGH array. If sequencing is performed outside of Emory Genetics Laboratory, please submit a copy of the sequencing report with the test requisition.

**Related Tests**

- Sequence analysis of the *PAX6* gene is available and is required before deletion/duplication analysis.
- Several comprehensive next generation sequencing Eye Disorder Panels are available.
- Custom diagnostic mutation analysis (KM) is available to family members if mutations are identified by targeted mutation testing or sequencing analysis.
- Prenatal testing is available only for known familial mutations to individuals who are confirmed carriers of mutations. Please contact the laboratory genetic counselor to discuss appropriate testing prior to collecting a prenatal specimen.