

## 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* cause aniridia and non-aniridia eye disorders.

#### Aniridia

Aniridia is complete or partial iris hypoplasia. It is associated with foveal hypoplasia and results in nystagmus 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
- Azuma et al. (2003), *Am J Hum Genet*, 72:1565-1570.
- Shukla and Mishra, (2011), *Exp Eye Res*, 93:40-49.

### 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.

### 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

**Submit only 1 of the following specimen types**

#### Type: Whole Blood (EDTA)

##### Specimen Requirements:

EDTA (Purple Top)

Infants and Young Children (2 years of age to 10 years old): 3-5 ml

Older Children & Adults: 5-10 ml

Autopsy: 2-3 ml unclotted cord or cardiac blood

##### Specimen Collection and Shipping:

Ship sample at room temperature for receipt at EGL within 24 hours of collection. Do not refrigerate or freeze.

#### Type: DNA, Isolated

**Specimen Requirements:**

Microtainer

3µg

Isolation using the Perkin Elmer™ Chemagen™ Chemagen™ Automated Extraction method or Qiagen™ Puregene kit for DNA extraction is recommended.

**Specimen Collection and Shipping:**

Refrigerate until time of shipment in 100 ng/µL in TE buffer. Ship sample at room temperature with overnight delivery.

**Special Instructions**

Sequence analysis is required before deletion/duplication analysis by targeted CGH array. If sequencing is performed outside of EGL Genetics, 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.