Choroideremia: CHM Gene Deletion/Duplication

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

Condition Description

Choroideremia is an X-linked disorder causing chorioretinal degeneration with an incidence of 1 in 50,000. Mutations in the CHM (Xq21.2) gene cause this condition.

The characteristic feature of choroideremia is the progressive chorioretinal degeneration in affected males. In males, the symptoms range from night blindness to peripheral visual field loss with central vision preserved until late in life. About 30% of males have posterior subcapsular cataracts. Carrier females are usually asymptomatic but the chorioretinal degeneration can be picked up by fundus examination. They also exhibit mild symptoms after the second decade of life. In cases of skewed X-inactivation, females can develop symptoms similar to affected males.

Both sequencing and deletion/duplication mutations have been described in the CHM gene. A founder splice site mutation in exon 13 is common in the Finnish population. Rarely, CHM can be part of a more severe contiguous gene deletion syndrome involving Xq21.

For patients with suspected choroideremia, sequence analysis is recommended as the first step in mutation identification. For individuals in whom mutations are not identified by full gene sequencing, deletion/duplication analysis is appropriate.

References:

- GeneReviews
- MacDonald et al. (2004), Expert Rev Mol Diagn, 4:478-84
- MacDonald et al. (2009), Surv Ophthalmol, 54:401–7
- OMIM #303100: Choroideremia
- OMIM #300390: CHM gene

Genes

CHM

Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of choroideremia in an individual in whom sequence analysis was negative.
- Carrier testing in adults with a family history of choroideremia 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. Sequencing and whole/partial gene deletions account for approximately 60-95% of cases. 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

* Preferred specimen type: Whole Blood

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: Refrigerate until time of shipment. Ship sample within 5 days of collection at room temperature with overnight delivery.

**Type: Saliva**

Specimen Requirements:

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

Specimen Collection and Shipping: Store sample at room temperature. Ship sample within 5 days of collection 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 Emory Genetics Laboratory, please submit a copy of the sequencing report with the test requisition.

**Related Tests**

- Sequence analysis of the CHM gene is available and is required before deletion/duplication analysis.
- 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.