Autosomal Dominant Optic Atrophy: \textit{OPA3} Gene Sequencing

\textbf{Test Code:} AF  
\textbf{Turnaround time:} 4 weeks  
\textbf{CPT Codes:} 81479 \(x1\)

**Condition Description**

Mutations in the \textit{OPA3} gene have been associated with different forms of optic atrophy. Autosomal dominant optic atrophy (ADOA) is characterized by progressive visual loss beginning in childhood, loss of visual acuity, and optic nerve pallor. Mutations in the gene \textit{OPA3} have been associated with ADOA and cataracts (ADOAC) [1]. Type III 3-methylglutaconic aciduria (MGA; Costeff optic atrophy syndrome) is an autosomal recessive disorder characterized by early onset bilateral optic atrophy and later onset ataxia, spasticity, and cognitive decline. A hallmark of disease is increased urinary excretion of 3-methylglutaconic and 3-methylglutaric acid. A founder \textit{OPA3} mutation accounts for the relatively high frequency of Type III MGA in the Iraqi Jewish population [2]. Diagnostic sequencing analysis of the \textit{OPA3} gene coding region is available for patients with optic atrophy and their at risk family members.

For further information call EGL Genetics at 470-378-2200.

For patients with mutations not identified by full gene sequencing, a separate deletion/duplication assay is available using a targeted CGH array KN.

**References:**


**Genes**

\textit{OPA3}

**Indications**

- Clinical features associated with \textit{OPA3} gene mutations
- Prenatal testing after a familial mutation has been identified
- Testing for persons at risk for carrying a familial mutation

**Methodology**

PCR amplification of 2 exons contained in the \textit{OPA3} gene coding region will performed on patient genomic DNA. Direct sequencing of amplification products is performed in both the forward and reverse directions using automated fluorescence dideoxy sequencing methods. Patient gene sequences are compared to a normal reference sequence. Sequence variations are then classified as mutations, benign variants unrelated to disease or variations of unknown clinical significance. Variants of unknown clinical significance may require further studies of the patient and/or family members.

This assay does not interrogate the promoter region, deep intronic regions or other regulatory elements. Large deletions are not detected by this analysis. Results of molecular analysis must be interpreted in the context of the patient's clinical and/or biochemical phenotype.

**Detection**

Analytical Sensitivity: \(\sim 99\%\)

Results of molecular analysis must 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) 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 EGL Genetics, please submit a copy of the sequencing report with the test requisition. Contact the laboratory if further information is needed.

**Related Tests**

- **OPA1** gene sequencing
- **Custom diagnostic mutation analysis (KM)** is available to family members if mutations are identified by sequencing.
- A deletion/duplication assay is available separately for individuals where mutations are not identified by sequence analysis. Refer to the test requisition or contact the laboratory for more information.
- Prenatal testing is available to couples who are confirmed carriers of mutations. Please contact the laboratory genetic counselor to discuss appropriate testing prior to collecting a prenatal specimen.