Hypohidrotic Ectodermal Dysplasia: Sequencing Panel

Test Code: MM420
Turnaround time: 6 weeks
CPT Codes: 81479 x2

Condition Description

Most cases of hypohidrotic ectodermal dysplasia are thought to be caused by mutations in the \textit{EDA}, \textit{EDAR}, and \textit{EDARADD}. These genes produce proteins that form part of a signaling pathway critical for the interaction between the ectoderm and mesoderm cell layers. Ectoderm-mesoderm interactions are essential for the formation of several structures that arise from the ectoderm, including the skin, hair, nails, teeth, and sweat glands.

Hypohidrotic ectodermal dysplasia has several different inheritance patterns. Most cases are caused by mutations in the \textit{EDA} gene, which are inherited in an X-linked recessive pattern. \textit{EDAR} mutations can have an autosomal dominant or autosomal recessive inheritance pattern, while \textit{EDARADD} mutations have an autosomal recessive inheritance pattern.

Reference:
- GeneReviews.

Genes

\textbf{EDA, EDAR, EDARADD}

Indications

The test is indicated for:
- Individuals with a clinical or suspected diagnosis of hypohidrotic ectodermal dysplasia.

Methodology

\textbf{Next Generation Sequencing}:
In-solution hybridization of all coding exons is performed on the patient's genomic DNA. Although some deep intronic regions may also be analyzed, this assay is not meant to interrogate most promoter regions, deep intronic regions, or other regulatory elements, and does not detect single or multi-exon deletions or duplications. Direct sequencing of the captured regions is performed using next generation sequencing. The patient's gene sequences are then compared to a standard reference sequence. Potentially causative variants and areas of low coverage are Sanger-sequenced. Sequence variations are classified as pathogenic, likely pathogenic, benign, likely benign, or variants of unknown significance. Variants of unknown significance may require further studies of the patient and/or family members.

Detection

\textbf{Next Generation Sequencing}:
Clinical Sensitivity: Unknown. Mutations in the promoter region, some mutations in the introns and other regulatory element mutations cannot be detected by this analysis. Large deletions/duplications will not be detected by this analysis. Results of molecular analysis should be interpreted in the context of the patient's clinical/biochemical phenotype.

Analytical Sensitivity: \~99%.

Specimen Requirements

Submit only 1 of the following specimen types

\textbf{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: Ship sample at room temperature with overnight delivery.

\textbf{Type: Isolated DNA}

Specimen Requirements:
- In microtainer: 60 ug
- Isolation using the Qiagen™ Puregene kit for DNA extraction is recommended.

Specimen Collection and Shipping: Refrigerate until time of shipment in 100 ng/ul of TE buffer. Ship sample at room temperature with overnight delivery.
Related Tests

- Hypohidrotic Ectodermal Dysplasia: Deletion/Duplication Panel