

Mucopolysaccharidosis Type II: *IDS* Gene Deletion/Duplication

Test Code: LW

Turnaround time: 2 weeks

CPT Codes: 81228 x1

Condition Description

Mucopolysaccharidosis type II (Hunter Syndrome) is a member of a group of inherited metabolic disorders collectively termed mucopolysaccharidoses (MPS's). The MPS's are caused by a deficiency of lysosomal enzymes required for the degradation of mucopolysaccharides or glycosaminoglycans (GAGs). Mucopolysaccharidosis type II or Hunter Syndrome (MPS II) is an X-linked disorder resulting from the deficiency of iduronate 2-sulfatase. The deficiency of iduronate sulfatase activity results in the lysosomal accumulation of heparan and dermatan sulfate.

Mucopolysaccharides make up a large portion of the intercellular substance of connective tissue, therefore multiple organ systems are involved, including the musculoskeletal, integumentary, cardiovascular, pulmonary, and ocular systems. Symptoms may include coarse facial features, short stature, enlarged liver and spleen, progressive mental retardation, skeletal changes, joint stiffness, progressive airway obstruction, short neck, broad chest, large head, and progressive deafness. Two types of Hunter syndrome have been described, mild and severe, but individuals with intermediate severity who do not fit clearly in either the severe or the mild end of the spectrum have been described. It is now clear, based on current understanding of the enzyme and its gene, that MPS II comprises a wide spectrum of severity and that individuals may be categorized anywhere from severe to mild Hunter with many individuals having an intermediate form somewhere between severe and mild. Enzyme replacement therapy is FDA approved to treat the symptoms of Hunter patients. Because of the X-linked recessive pattern of inheritance, this is almost exclusively a disorder that affects males.

Mutations to the *IDS* gene causes deficiency of iduronate 2-sulfatase. Diagnostic sequencing analysis of the *IDS* gene coding region is available for MPS type II patients and their at-risk relatives on a clinical basis. For questions about testing for MPS II, call EGL Genetics at (470) 378-2200 or (855) 831-7447. For further clinical information about lysosomal storage diseases, including management and treatment, call the Emory Lysosomal Storage Disease Center at (404) 778-8565 or (800) 200-1524.

Due to the presence of a pseudogene for the *IDS* gene, analysis of deletion or duplication of exon 3 cannot be included in this assay.

References:

- 1). Jonsson, J. J.; Aronovich, E. L.; Braun, S. E.; Whitley, C. B. Molecular diagnosis of mucopolysaccharidosis type II (Hunter syndrome) by automated sequencing and computer-assisted interpretation: toward mutation mapping of the iduronate-2-sulfatase gene. *Am. J. Hum. Genet.* 56: 597-607, 1995.
- 2). Upadhyaya, M.; Sarfarazi, M.; Bamforth, J. S.; Thomas, N. S. T.; Oberle, I.; Young, I.; Harper, P. S. : Localisation of the gene for Hunter syndrome on the long arm of X chromosome. *Hum. Genet.* 74: 391-398, 1986.
- 3). Froissart, R, Da Silva, IM, Maire, I. Mucopolysaccharidosis type II: an update on mutation spectrum. *Acta Paediatrica* 96: 71-77. 2007.

Genes

[IDS](#)

Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of MPS II in individuals who have tested negative for sequence analysis
- Carrier testing in adult females with a family history of MPS II who have tested negative for sequence analysis

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 72 hours of collection. Do not 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

Submit copies of diagnostic biochemical test results with the sample, if appropriate. Contact the laboratory if further information is needed.

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 *IDS* gene is available and is required before deletion/duplication analysis.
- 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.