Mucopolysaccharidosis Type VI: ARSB Gene Deletion/Duplication

Condition Description

Mucopolysaccharidosis type VI (MPS VI), also known as Maroteaux-Lamy Syndrome, is a lysosomal storage disorder caused by absence or dysfunction of the enzyme arylsulfatase B (N-acetylgalactosamine 4-sulfatase). This enzyme is one of a group responsible for the degradation of dermatan sulfate, a glycosaminoglycan (GAG) normally broken down in the lysosomes. In MPS VI, insufficient enzyme activity is available and the degradation of dermatan sulfate is blocked, leading to accumulation of this substrate in the lysosomes of several tissues.

The clinical presentation can vary from mild to severe. The major clinical manifestations are corneal clouding, joint stiffness, and a skeletal dysplasia known as dysostosis multiplex. Unlike most lysosomal storage disorders, intelligence is unaffected. Macrocephaly and sternal abnormalities can be present at birth, and inguinal/umbilical hernias are common. Restriction of joint movement develops sometime in the first few years of life, and a typical crouched posture is assumed. Hepatomegaly, corneal clouding, claw-hand deformities, cardiac valve involvement, decreased pulmonary function, and sleep apnea become evident as the child ages. Respiratory infections are common. Growth in height is usually less than normal, but variable with the severity of disease. Facial features become more coarse with age, and individuals with MPS VI often resemble one another. Deafness, both sensorineural or conductive, is seen in all types of mucopolysaccharidoses, including MPS VI. Spinal cord compression is a typical complication in older children and adults. Carpal tunnel syndrome and nerve compression is also seen in older children and adults. Enzyme replacement therapy (ERT) for MPS VI has been approved by the FDA and is available for treatment of this disorder.

Mutations in the ARSB gene result in reduced activity of the arylsulfatase B enzyme. Diagnostic sequencing analysis of the ARSB gene coding region is available for MPS VI patients and their at-risk relatives on a clinical basis.

For questions about testing for MPS VI, 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.

References:

Genes

ARSB

Indications

- Confirmation of a clinical diagnosis of MPS VI (Maroteaux-Lamy).
- Prenatal testing for known familial mutations.
- Assessment of carrier status in high risk family members known mutation 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. Array CGH will not detect point mutations or intronic mutations. 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

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™ 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. Sequence analysis is required before deletion/duplication analysis by targeted CGH array. If sequencing is performed outside EGL Genetics, please submit a copy of the sequencing report with the test requisition. Contact the laboratory if further information is needed.

Related Tests
- Mucopolysaccharide screen (urine GAG) (GA)
- Known mutation analysis (Custom Diagnostics) is available to test family members.
- Prenatal testing is available for known familial mutations only.
- Please call the Laboratory Genetic Counselor for specific requirements for prenatal testing before collecting a fetal sample.