

Lysosomal Storage Disorders: Deletion/Duplication Panel

Test Code: MD120

Turnaround time: 2 weeks

CPT Codes: 81228 x1, 81401 x1

Condition Description

Lysosomal storage disorders (LSDs) are a heterogeneous group of mostly autosomal recessive disorders with the exception of mucopolysaccharidosis type II (MPS II) also known as Hunter syndrome, Danon disease, and Fabry disease which show X-linked inheritance. LSDs comprise more than 50 metabolic disorders including defects in degradative and synthetic enzymes, lysosomal membrane defects, the neuronal ceroid lipofuscinoses (NCLs) and disorders of lysosome biogenesis and endosome–lysosome traffic.

Clinical and biochemical features continue to be used reliably to assign patients to this general disease category. Identification of the precise genetic defect is important, however, to permit carrier testing and early prenatal diagnosis. Molecular analysis is likely to expand the clinical spectrum of LSD and may also provide data relevant to prognosis and future therapeutic intervention. The overall incidence of LSDs as a group is estimated to be 1 in 5,000 births.

Although each LSD results from pathogenic variants in a different gene leading to a deficiency of enzyme activity or protein function, LSDs share one common biochemical characteristic: an accumulation of substrates within lysosomes. The particular substrates that are stored and the site(s) of storage vary. The substrate type is used to group the LSDs into broad categories, including the MPSs, the lipidoses, the glycogenoses, the oligosaccharidoses, and NCLs. Despite this categorization, many clinical similarities are observed between groups as well as within each group. Common clinical features of LSDs include coarse hair and facies, bone abnormalities, organomegaly, and central nervous system dysfunction.

References:

- Boustany RM. *Nat Rev Neurol*. 2013 Oct;9(10):583-98.
- Fulle M, et al. Fabry Disease: Perspectives from 5 Years of FOS. Chapter 2: Epidemiology of lysosomal storage diseases: an overview.
- Huizing, M., Helip-Wooley, A., Westbroek, W., et al. *Annu. Rev. Genomics Hum. Genet.* 2008 (9): 359–386.
- OMIM

Genes

[ADAMTS10](#), [AGA](#), [ARSA](#), [ARSB](#), [ASAH1](#), [ATP13A2](#), [CLN3](#), [CLN5](#), [CLN6](#), [CLN8](#), [CTNS](#), [CTSA](#), [CTSD](#), [DNAJC5](#), [FBN1](#), [FUCA1](#), [GAA](#), [GALC](#), [GALNS](#), [GLA](#), [GLB1](#), [GM2A](#), [GNE](#), [GNPTAB](#), [GNPTG](#), [GNS](#), [GRN](#), [GUSB](#), [HEXA](#), [HEXB](#), [HGSNAT](#), [HYAL1](#), [IDS](#), [IDUA](#), [KCTDZ](#), [LAMP2](#), [LIPA](#), [LTBP2](#), [MAN2B1](#), [MANBA](#), [MCOLN1](#), [MFSD8](#), [NAGA](#), [NAGLU](#), [NEU1](#), [NPC1](#), [NPC2](#), [PPT1](#), [PSAP](#), [SGSH](#), [SLC17A5](#), [SMPD1](#), [SUMF1](#), [TPP1](#)

Indications

This test is indicated for individuals:

- With clinical features such as bone abnormalities, organomegaly, central nervous system dysfunction and coarse hair and facies.
- In which NCLs are suspected (presenting with neurocognitive decline, blindness, seizures and premature death).
- Abnormal biochemical results suggestive of an LSD.

Methodology

Deletion/Duplication Analysis: DNA isolated from peripheral blood is hybridized to a gene-targeted CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes that cover the entire genomic region.

Detection

Deletion/Duplication Analysis: 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: 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/ μ L in TE buffer. Ship sample at room temperature with overnight delivery.

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 24 hours of collection. Do not refrigerate or freeze.

Related Tests

- Lysosomal Storage Disorders: Sequencing Panel
- Biochemical enzyme assay for lysosomal storage disorders