Formiminotransferase Deficiency/FIGLU-uria: FTCD Gene Deletion/Duplication

**Test Code:** DFTCD  
**Turnaround time:** 2 weeks  
**CPT Codes:** 81228 x1

**Condition Description**

Formiminotransferase deficiency is an autosomal recessive disorder that is the second most common inborn error of folate metabolism. There are two forms of the disorder: a severe phenotype and a mild phenotype. The severe phenotype is associated with elevated levels of formiminoglutamate (FIGLU) in the urine in response to histidine administration, megaloblastic anemia, and mental retardation. Features of the mild phenotype include high urinary excretion of FIGLU in the absence of histidine administration, mild developmental delay, and no hematological abnormalities.

Formiminotransferase-cyclodeaminase (FTCD) is a bifunctional enzyme that catalyzes two consecutive reactions that couple histidine degradation to folate metabolism. The highest levels of FTCD are found in the liver. While high levels of FIGLU in the urine suggest FTCD deficiency, there are other causes of elevated FIGLU excretion. Confirmation of a diagnosis of FTCD deficiency requires an enzyme assay from a liver biopsy; enzymatic activity is not detectable in either fibroblasts or blood cells. Mutations in the FTCD gene (21q22.3) cause formiminotransferase deficiency.

**Sources**

3. OMIM entries 229100 and 606806

**Genes**

FTCD

**Indications**

This test is indicated for:

- Confirmation of a clinical diagnosis of FTCD deficiency in individuals who have tested negative for sequence analysis  
- Carrier testing in adults with a family history of FTCD deficiency 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: 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.

**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.

**Special Instructions**

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

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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 *FTCD* 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.