Congenital Muscular Dystrophy with Integrin Alpha 7 Deficiency: \textit{ITGA7} Gene Deletion/Duplication

**Condition Description**

The congenital muscular dystrophies are a group of genetically and clinically heterogeneous hereditary myopathies characterized by congenital hypotonia and muscle weakness, contractures, and delayed motor development. Muscle biopsy usually reveals a nonspecific dystrophic pattern. The clinical course is broadly variable and can involve the brain and eyes. Initial testing often includes clinical evaluation, muscle imaging, electromyography, and muscle biopsy, followed by targeted genetic testing.

Congenital muscular dystrophy with integrin alpha 7 deficiency is an extremely rare autosomal recessive CMD that has been reported in only a few patients. Reported symptoms include proximal weakness, congenital torticollis, congenital hip dislocation, multiple joint contractures, and motor delays characteristic of a congenital myopathy. One patient was reported to have mental retardation without brain MRI changes.

Affected individuals have mildly elevated serum creatine kinase levels and immunohistochemistry can reveal absent integrin alpha 7 with normal laminin alpha 2 (merosin). Muscle biopsy is consistent with congenital myopathy. Mutations in the \textit{ITGA7} gene (12q13), including deletions, splice-site mutations, and missense mutations, have been found in affected individuals.

For patients with suspected CMD with integrin alpha 7 deficiency, sequence analysis is recommended as the first step in mutation identification. For patients in whom mutations are not identified by full gene sequencing, deletion/duplication analysis is appropriate.

**References**


**Genes**

\textit{ITGA7}

**Indications**

This test is indicated for:

- Confirmation of a clinical diagnosis of CMD with integrin alpha 7 deficiency in an individual in whom sequence analysis was negative
- Carrier testing in adults with a family history of CMD with integrin alpha 7 deficiency in whom sequence analysis was negative

**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**

\textit{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.

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 *ITGA7* 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.