Rigid Spine with Muscular Dystrophy Type 1 (RSMD1): \textit{SELENON} Gene Deletion/Duplication

\textbf{Test Code:} DSEP1  
\textbf{Turnaround time:} 2 weeks  
\textbf{CPT Codes:} 81228 x1

\begin{tabular}{|l|}
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\textbf{Condition Description} \\
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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.

Rigid spine with muscular dystrophy type 1 (RSMD1) is an autosomal recessive condition characterized by hypotonia, neck weakness, early scoliosis, muscle weakness, and respiratory insufficiency. The first symptoms are usually hypotonia and poor head control in the neonatal period. Rigidity of the spine evolves into scoliosis. Other features include proximal weakness of the limbs which can lead to a waddling gait and Gowers’ sign, mild contractures of the extremities, and respiratory failure that can require nocturnal ventilatory assistance. Age of onset is approximately birth to one year of age; some individuals learn to walk around two and a half years of age while others never walk. A broad phenotypic spectrum has been observed.

Serum creatine kinase (CK) levels are normal to mildly elevated, and immunohistochemistry of muscle tissue shows normal laminin alpha 2 (mersoin) staining. Mutations in the \textit{SELENON} gene (1p36-p35) cause RSMD1. \textit{SELENON} mutations also cause multimicronic disease and desmin-related myopathy with Mallory body-like inclusions.

For patients with suspected RSMD1, 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.

\begin{itemize}
  \item Bonnemann, Carsten. Personal communication. July 8, 2009.
  \item Mendell, JR et al. The congenital muscular dystrophies: Recent advances and molecular insights. Ped and Dev Pathology. 2006; 9:427-443.
\end{itemize}

\begin{tabular}{|l|}
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\textbf{Genes} \\
\hline
\textit{SELENON} \\
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\textbf{Indications} \\
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This test is indicated for:
\begin{itemize}
  \item Confirmation of a clinical diagnosis of RSMD1 in an individual in whom sequence analysis was negative
  \item Carrier testing in adults with a family history of RSMD1 in whom sequence analysis was negative
\end{itemize}
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\textbf{Methodology} \\
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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.

\textbf{Detection} \\
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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.
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\textbf{Specimen Requirements} \\
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\textit{Submit only 1 of the following specimen types} \\
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\begin{tabular}{|l|}
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\textbf{Type: DNA, Isolated} \\
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\textbf{Specimen Requirements:} \\
Microtainer
3µg
Isolation using the Perkin Elmer™Chemagen™ Chemagen™ Automated Extraction method or Qiagen™ Puregene kit for DNA extraction is recommended.
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\textbf{Specimen Collection and Shipping:} \\
Refrigerate until time of shipment in 100 ng/µL in TE buffer. Ship sample at room temperature with overnight delivery.
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\textbf{Type: Whole Blood (EDTA)} \\
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\textbf{Specimen Requirements:} \\
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\end{tabular}

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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 **SELENON** 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.