Congenital Variant Rett Syndrome: \textit{FOXG1} Gene Deletion/Duplication

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

\textbf{Condition Description}

Mutations and deletions of the \textit{FOXG1} gene (14q13) cause a developmental disorder known as a Congenital Variant of Rett syndrome. Common features include severe postnatal microcephaly, severe intellectual disability with absent language, apraxia, hypogenesis of the corpus callosum, jerky movements and generalized seizures. These individuals have normal body measurements at birth but then have slow growth after leading to low weight and low normal stature. Sleep was reported to be disrupted starting in infancy and stereotypical hand movements were observed. Unlike Rett syndrome, individuals with a \textit{FOXG1} mutation do NOT have any periods of normal development.

Duplications of the \textit{FOXG1} gene have been associated with developmental epilepsy, intellectual disability, and severe speech impairment.

For patients with suspected Congenital Variant of Rett syndrome, 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.

\textbf{References:}

- OMIM \#613454: Congenital Variant Rett syndrome  
- OMIM \#164874: \textit{FOXG1} gene

\textbf{Genes}

\textit{FOXG1}

\textbf{Indications}

This test is indicated for:

- Confirmation of a clinical diagnosis of Congenital Variant Rett syndrome in an individual in whom sequence analysis was negative.  
- Carrier testing in adults with a family history of Congenital Variant Rett syndrome in whom sequence analysis was negative.

\textbf{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.

Please note that a “backbone” of probes across the entire genome are included on the array for analytical and quality control purposes. Rarely, off-target copy number variants causative of disease may be identified that may or may not be related to the patient's phenotype. Only known pathogenic off-target copy number variants will be reported. Off-target copy number variants of unknown clinical significance will not be reported.

\textbf{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.

\textbf{Specimen Requirements}

Submit only 1 of the following specimen types

* Preferred specimen type: Whole Blood

\textbf{Type: Whole Blood}

Specimen Requirements:

In EDTA (purple top) tube:  
Infants (2 years): 3-5 ml  
Older Children & Adults: 5-10 ml

Specimen Collection and Shipping: Refrigerate until time of shipment. Ship sample within 5 days of collection at room temperature with overnight delivery.

\textbf{Type: Saliva}

Specimen Requirements:
Oragene™ Saliva Collection kit (available through EGL) used according to manufacturer instructions.

Specimen Collection and Shipping: Store sample at room temperature. Ship sample within 5 days of collection at room temperature with overnight delivery.

**Special Instructions**

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 FOXG1 gene is available and is required before deletion/duplication analysis.
- Custom diagnostic mutation analysis (KM) is available to family members if mutations are identified by targeted mutation testing or sequencing analysis.
- Prenatal testing is available only for known familial mutations to individuals who are confirmed carriers of mutations. Please contact the laboratory genetic counselor to discuss appropriate testing prior to collecting a prenatal specimen.