Pitt-Hopkins-like Syndrome-2: \textit{NRXN1} Gene Deletion/Duplication

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

\begin{itemize}
  \item \textbf{Condition Description}
  \end{itemize}

Pitt-Hopkins-like syndrome-1 and Pitt-Hopkins-like syndrome-2 are inherited in an autosomal recessive manner and are caused by mutations in the \textit{CNTNAP2} (7q35) and \textit{NRXN1} (2p16.3) genes respectively. Both of these conditions resemble Pitt-Hopkins syndrome, caused by mutation of the \textit{TCF4} gene, with regard to the distinctive facial features, severe intellectual disability and breathing abnormalities; however, there is a phenotypical difference. While speech is severely impaired, individuals with mutation the \textit{CNTNAP2} or \textit{NRXN1} gene have normal or mildly delayed motor milestones.

Please note that this test is for the \textit{NRXN1} gene only.

For patients with suspected Pitt-Hopkins-like syndrome-2, 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 \textbf{References:}
    \begin{itemize}
      \item OMIM \#600565: \textit{NRXN1} gene
      \item OMIM \#614325: Pitt-Hopkins-like syndrome-2
      \item OMIM \#610954: PTHS
    \end{itemize}
\end{itemize}

\begin{itemize}
  \item \textbf{Genes}
    \ \textit{NRXN1}
\end{itemize}

\begin{itemize}
  \item \textbf{Indications}
    \begin{itemize}
      \item Confirmation of a clinical diagnosis of Pitt-Hopkins-like syndrome-2 in an individual in whom sequence analysis was negative.
      \item Carrier testing in adults with a family history of Pitt-Hopkins-like syndrome-2 in whom sequence analysis was negative.
    \end{itemize}
\end{itemize}

\begin{itemize}
  \item \textbf{Methodology}
    \begin{itemize}
      \item 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.
    \end{itemize}
\end{itemize}

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.

\begin{itemize}
  \item \textbf{Detection}
    \begin{itemize}
      \item 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.
    \end{itemize}
\end{itemize}

\begin{itemize}
  \item \textbf{Specimen Requirements}
    \begin{itemize}
      \item Submit only 1 of the following specimen types
        \begin{itemize}
          \item Preferred specimen type: Whole Blood
        \end{itemize}
      \item Type: Whole Blood
        \begin{itemize}
          \item Specimen Requirements:
            \begin{itemize}
              \item In EDTA (purple top) or ACD (yellow top) tube:
                \begin{itemize}
                  \item Infants (2 years): 3-5 ml
                  \item Older Children & Adults: 5-10 ml
                \end{itemize}
            \end{itemize}
          \item Specimen Collection and Shipping: Refrigerate until time of shipment. Ship sample within 5 days of collection at room temperature with overnight delivery.
        \end{itemize}
      \item Type: Saliva
    \end{itemize}
\end{itemize}
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 Emory Genetics Laboratory, please submit a copy of the sequencing report with the test requisition.

### Related Tests

- Sequence analysis of the NRXN1 gene is available and is required before deletion/duplication analysis.
- Sequencing and deletion/duplication analysis of the CNTNAP2 and TCF4 genes are available.
- 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.

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