Clinical Features and Molecular Genetics
Mutations in \textit{NEUROG3} [OMIM\#604882] are associated with congenital malabsorptive diarrhea, neonatal diabetes and impaired pancreatic exocrine function (1, 2). All reported cases present with chronic unremitting malabsorptive diarrhea in the first weeks of life. \textit{NEUROG3} is a transcription factor involved in the determination of neural precursor cells in the neuroectoderm, it is expressed in endocrine progenitor cells and is required for endocrine cell development in the pancreas and intestine(3).

Inheritance
\textit{NEUROG3} mutations follow an autosomal recessive inheritance pattern and are a rare cause of permanent neonatal diabetes mellitus. Parents of an affected child are most likely obligate carriers. Recurrence risk for carrier parents is 25%.

Test methods:
Comprehensive sequence coverage of the coding regions and splice junctions of the \textit{NEUROG3} gene is performed. Targets of interests are captured and amplified using Agilent SureSelect target enrichment system. The constructed genomic DNA library is sequenced using Illumina technology and reads are aligned to the reference sequence. Variants are identified and evaluated using a custom collection of bioinformatic tools and comprehensively interpreted by our team of directors and genetic counselors. All novel and/or potentially pathogenic variants are confirmed by Sanger sequencing. The technical sensitivity of this test is estimated to be >99\% for single nucleotide changes and insertions and deletions of less than 20bp. Deletion/duplication analysis of the \textit{NEUROG3} gene is performed by oligonucleotide array-CGH. Partial exonic copy number changes and rearrangements of less than 400 bp may not be detected by array-CGH. Array-CGH will not detect low-level mosaicism, balanced translocations, inversions, or point mutations that may be responsible for the clinical phenotype. The sensitivity of this assay may be reduced when DNA is extracted by an outside laboratory.

\textbf{\textit{NEUROG3} sequencing}

\begin{tabular}{|l|}
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Sample specifications: & 3 to 10 cc of blood in a purple top (EDTA) tube \\
Cost: & $1000 \\
CPT codes: & 81403 \\
Turn-around time: & 4 weeks \\
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\textbf{\textit{NEUROG3} deletion/duplication analysis}

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Sample specifications: & 3 to 10 cc of blood in a purple top (EDTA) tube \\
Cost: & $1000 \\
CPT codes: & 81403 \\
Turn-around time: & 4 weeks \\
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Results:
Results, along with an interpretive report, will be faxed to the referring physician. Additional reports will be provided as requested. All abnormal results will be reported by telephone.

\textbf{For more information about our testing options, please visit our website at dnatesting.uchicago.edu or contact us at 773-834-0555. }

References: