Disproportionate Short Stature: Sequencing Panel

Test Code: MM171
Turnaround time: 6 weeks
CPT Codes: 81404 x1, 81405 x1, 81406 x1

Condition Description

Skeletal dysplasias are a heterogeneous group of more than 450 disorders with complex mechanisms. Clinical and biochemical features continue to be used reliably to assign patients to this general disease category. Identification of the precise genetic defect is important; however, to permit carrier testing and early prenatal diagnosis. Molecular analysis is likely to expand the clinical spectrum of skeletal dysplasia and may also provide data relevant to prognosis and future therapeutic intervention.

Collectively, the incidence of skeletal dysplasia is estimated to be 1 in 5,000 births. Skeletal dysplasia is referred to as generalized disorders of cartilage and bone, frequently resulting in disproportionate short stature. A variety of complications can be associated with skeletal dysplasias, including orthopedic, neurologic, auditory, visual, pulmonary, cardiac, renal, and psychological.

References:

Genes

ACAN, ACP5, AGPS, ANKH, ANOS1, ARSE, B3GALT6, BMPR1B, CANT1, CDKN1C, CHST14, CHST3, COL10A1, COL11A1, COL11A2, COL1A1, COL2A1, COL9A1, COL9A2, COL9A3, COMP, CTSL, CUL7, DDD2, DHCPR24, DLL3, DYM, DYNC2H1, EBP, EIF2AK3, EVC, EVC2, EXT1, EXT2, FMAC20C, FBNI, FGFR1, FGFR2, FGFR3, FLNA, FLNB, GDF5, GLI3, GPC6, HES7, HSPG2, ICK, IFT122, IFT140, IFT80, IHH, KIF22, LFG, LIFR, MATN3, MESP2, MMP13, MMP9, NEK1, NKX3-2, NPR2, OBSL1, PAPSS2, PCNT, PRKAR1A, PTH1R, PTPN11, ROR2, RUNX2, SH3PD2B, SHOX, SLCO2A1, SLCO3A1, SMARCA1, SOX3, SULF1, TBCE, TBX6, TCTN3, TRIP11, TRPS1, TRPV4, WDR35, WNT5A

Indications

This test is indicated for:
- Short stature with abnormal radiographic findings.

Methodology

Next Generation Sequencing: In-solution hybridization of all coding exons is performed on the patient's genomic DNA. Although some deep intronic regions may also be analyzed, this assay is not meant to interrogate most promoter regions, deep intronic regions, or other regulatory elements, and does not detect single or multi-exon deletions or duplications. Direct sequencing of the captured regions is performed using next generation sequencing. The patient's gene sequences are then compared to a standard reference sequence. Potentially causative variants and areas of low coverage are Sanger-sequenced. Sequence variations are classified as pathogenic, likely pathogenic, benign, likely benign, or variants of unknown significance. Variants of unknown significance may require further studies of the patient and/or family members.

Detection

Next Generation Sequencing: Clinical Sensitivity: Unknown. Mutations in the promoter region, some mutations in the introns and other regulatory element mutations cannot be detected by this analysis. Direct sequencing of the captured regions will be performed using next generation sequencing. The patient's gene sequences are then compared to a standard reference sequence. Potentially causative variants and areas of low coverage are Sanger-sequenced. Sequence variations are classified as pathogenic, likely pathogenic, benign, likely benign, or variants of unknown significance. Variants of unknown significance may require further studies of the patient and/or family members.

Analytical Sensitivity: ~99%.

Specimen Requirements

Submit only 1 of the following specimen types

Type: Whole Blood
Specimen Requirements:
- In EDTA (purple top) tube: Infants (2 years): 3-5 ml
- Older Children & Adults: 5-10 ml.

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Specimen Collection and Shipping: Ship sample at room temperature with overnight delivery.

**Type: Isolated DNA**

Specimen Requirements:

In microtainer: 60 ug

Isolation using the Qiagen™ Puregene kit for DNA extraction is recommended.

Specimen Collection and Shipping: Refrigerate until time of shipment in 100 ng/ul of TE buffer. Ship sample at room temperature with overnight delivery.

**Related Tests**

- Comprehensive Skeletal Dysplasia
- Disproportionate Short Stature: Deletion/Duplication Panel