Skeletal Dysplasia: Deletion/Duplication Panel

**Test Code:** MD170  
**Turnaround time:** 2 weeks  
**CPT Codes:** 81228 x 1

### 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 display 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. These disorders can range greatly in severity, from precocious arthropathy in relatively average stature individuals to severe dwarfism with perinatal mortality. A variety of complications can be associated with skeletal dysplasia, including orthopedic, neurologic, auditory, visual, pulmonary, cardiac, renal, and psychological. Five major groups are included in this panel: proportionate short stature; disproportionate short stature; skeletal dysplasias with increased bone density; skeletal dysplasias with decreased bone density osteodystrophy; and limb malformations.

### References:

### Genes

AC5P, ALPL, ANKH, ANOS, ARHGAP31, ATP6V0A2, B3GALT6, B4GALT7, BMP2, BMPR1B, CA2, CANT1, CASR, CC2D2A, CDH3, CDKN1C, CEP290, CHST14, CHST5, CHSY1, CLCN5, CLCN7, COL10A1, COL11A1, COL11A2, COL1A2, COL9A1, COL9A2, COL9A3, COMP, CRATP, CTSK, CUL7, DDR2, DCHRS4, DLX3, DMP1, DYM, DYNC2H1, EIF2AK3, ENPP1, ESCO2, EVC, EVC2, EX1, EX2, FAM20C, FBN1, FBXW4, FERMT3, FGFI0, FGF23, FGFR1, FGFR2, FGFR3, FKBP10, FLNA, FLNB, FMN1, GALNT3, GDF5, GLI3, GNAS, GORAB, GPC6, GREM1, HDAC4, HOXD13, HPGD, HPSE2, ICK, IFITM5, IFT122, IFT140, IFT80, IHH, KIF22, KIF7, LEMD3, LIFR, LMBR1, LMNA, LRPI, LRP5, MAFB, MATN3, MGP, MKS1, MMP13, MMP2, MMP3, MYCN, NEK1, NIPBL, NKX3.2, NOG, NOTCH2, NFR2, OBSL1, OSTM1, P3H1, PAPSS2, PCNT, PHEX, PIGV, PITX1, PLD2, PPILB, PRKAR1A, PTH1R, PTHLH, PTPN11, PYCR1, RASGRF2, RECQL4, ROR2, RPRGRF1L, RUNX2, SALL1, SALL4, SERPINF1, SH3PXD2B, SIH:1, SHOX, SLC26A2, SLC26A3, SLC35D1, SLC35A1, SMARCAL1, SOST, SOX9, SP7, SULF1, TBCE, TBX15, TBX3, TBX5, TBXAS1, TCIRG1, TCTN3, TGFBI, THPO, TMEM216, TMEM67, TNFRSF11A, TNFRSF11B, TNFRSF11F, TP63, TREM2, TRIP11, TRPS1, TRPV4, TYROBP, WDR35, WISP3, WNT3, WNT5A, WNT7A, ZMPSTE24

### Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of skeletal dysplasias.
- Carrier testing in adults with a family history of skeletal dysplasias.

### Methodology

#### Deletion/Duplication Analysis:
DNA isolated from peripheral blood is hybridized to a gene-targeted CGH array to detect deletions and duplications. The targeted CGH array has overlapping probes that 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.

### Detection
Deletion/Duplication Analysis: 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.

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

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

**Type: Isolated DNA**

Specimen Requirements:

In microtainer: 10 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.

**Special Instructions**

Please include radiographic findings for expert review at EGL Genetics.

**Related Tests**

- Skeletal Dysplasia: Sequencing Panel