Lab Dept: Anatomic Pathology

Test Name: SHOX GENE SEQUENCING

General Information

Lab Order Codes: SHOX

Synonyms: Short Stature homebox (SHOX)-related haploinsufficiency disorder, SHOX Gene Sequencing, SHOX Gene,

CPT Codes: 81405 – Molecular Pathology Level 6

Test Includes: The full SHOX coding region of each exon plus ~50 bp of flanking non-coding DNA on each side are sequenced.

Logistics

Test Indications: Candidates for this test are patients with symptoms consistent with SHOX-related haploinsufficiency and family members of patients who have known SHOX mutations. Short stature is a multifactorial developmental disorder. Short stature homebox (SHOX)-related haploinsufficiency is a genetic disorder that manifests as short stature with variable clinical severity. The SHOX-related disorders include the severe Lander Mesomelic Dysplasia (LMD; OMIM 249700) characterized by short stature with hypoplasia/aplasia; the Leri-Weill Dyschondrosteosis (LWD; OMIM 127300) characterized by disproportionate short stature with mesomelic shortening in the forearms and lower legs and bilateral Madelung deformity of the wrist; and idiopathic short stature (ISS;OMIM 300582) Intrafamilial phenotypic variability has been reported with SHOX-related haploinsufficiency. SHOX-related haploinsufficiency disorder is caused by mutations in the SHOX gene. The SHOX gene is located in the pseudoautosomal region (PAR1) on the X and Y chromosomes. There is a dose-dependent association between the number of active copies of the SHOX gene and height. Nullizygosity of the SHOX gene results in LMD, while haploinsufficiency of the SHOX gene results in LWD or ISS. Conversely, overdose of the SHOX gene is associated with tall stature. The SHOX gene encodes a homeodomain transcription factor that has a role in chondrocyte proliferation and differentiation. A mix of missense, nonsense, splicing, frameshift and gross deletions and duplications mutations within the SHOX gene has been reported.

Lab Testing Sections: Anatomic Pathology - Sendouts

Referred to: Prevention Genetics (PRVG Test: 626)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability:	Daily, 24 hours
Turnaround Time:	2-3 weeks
Special Instructions:	N/A

Specimen

Specimen Type:	Whole Blood
Container:	Purple top (EDTA) tube
Draw Volume:	5 mL (Minimum: 2 mL, Small babies: 1 mL) EDTA Whole Blood
Processed Volume:	Same as Draw Volume
Collection:	Routine blood collection
Special Processing:	Lab Staff: Do not Centrifuge. Forward specimens directly to sendouts. Store and ship at refrigerated temperatures. Blood specimens are stable for up to one week refrigerated. Do Not freeze blood. During hot weather, include a frozen ice pack in the shipping container. Place a paper towel or other thin material between the ice pack and the blood tube. In cold weather include an unfrozen ice pack in the shipping container as insulation.
Patient Preparation:	None
Sample Rejection:	Frozen specimens; mislabeled or unlabeled specimens; incorrect anticoagulant

Interpretive

Reference Range:	An interpretive report will be provided.
Critical Values:	N/A
Limitations:	SHOX mutations account for about 2% of idiopathic short stature cases. Approximately 30% of the SHOX-related haploinsufficiency mutations are point. Gene deletions are common.
Methodology:	This test involves bidirectional sequencing using genomic DNA of the 5 coding exons (exons 2-6) of the SHOX gene.
References:	Prevention Genetics April 2020
Updates:	2/11/2013: CPT update 1/18/2018: CPT update 4/22/2020: TAT updated