Rubinstein-Taybi Syndrome: CREBBP Gene Sequencing

Test Code: SCREB
Turnaround time: 6 weeks
CPT Codes: 81407 x1

Condition Description

Rubinstein-Taybi syndrome (RSTS) is characterized by clinical findings that include broad thumbs and great toes, distinctive facial features, moderate to severe intellectual disability, and short stature. The characteristic facial features include beaked nose, grimacing smile, high arched palate, downslanting palpebral fissures, and talon cusps. Other variable features include congenital heart defects, renal abnormalities, cataract, cryptorchidism, and coloboma.

The CREBBP and EP300 genes are the only two genes known to cause RSTS. Mutations in the CREBBP gene (16p13.3) are identified in 30-50% of individuals with RSTS. Mutations in the EP300 gene are identified in 3% of individuals with RSTS. Microdeletions account for approximately 10% of individuals with RSTS. RSTS is inherited in an autosomal dominant pattern; however, most of the mutations are de novo.

Please note that this test is for the CREBBP gene only.

For patients with suspected RSTS, 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.

References:
- GeneReviews
- OMIM #600140: CREBBP gene
- OMIM #180849: RSTS

Genes

CREBBP

Indications

This test is indicated for:

- Confirmation of a clinical diagnosis of Rubinstein-Taybi syndrome.
- Carrier testing in adults with a family history of Rubinstein-Taybi syndrome.

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

Clinical Sensitivity: 30-50%. Mutations in the promoter region, some mutations in the introns and other regulatory element mutations cannot be detected by this analysis. Large deletions will not be detected by this analysis. Results of molecular analysis should be interpreted in the context of the patient's clinical and/or biochemical phenotype.

Analytical Sensitivity: ~99%

Specimen Requirements

Submit only 1 of the following specimen types

Type: DNA, Isolated

Specimen Requirements:
- Microtainer
- 8µg
- Isolation using the Perkin Elmer™Chemagen™ Chemagen™ Automated Extraction method or Qiagen™ Puregene kit for DNA extraction is recommended.

Specimen Collection and Shipping:
- Refrigerate until time of shipment in 100 ng/µL in TE buffer. Ship sample at room temperature with overnight delivery.
Type: Whole Blood (EDTA)

Specimen Requirements:
EDTA (Purple Top)
Infants and Young Children (2 years of age to 10 years old): 3-5 ml
Older Children & Adults: 5-10 ml
Autopsy: 2-3 ml unclotted cord or cardiac blood

Specimen Collection and Shipping:
Ship sample at room temperature for receipt at EGL within 72 hours of collection. Do not freeze.

Type: Saliva

Specimen Requirements:
Oragene™ Saliva Collection Kit
Oragene™ Saliva Collection Kit used according to manufacturer instructions. Please contact EGL for a Saliva Collection Kit for patients that cannot provide a blood sample.

Specimen Collection and Shipping:
Please do not refrigerate or freeze saliva sample. Please store and ship at room temperature.

Related Tests

- Deletion/duplication analysis of the CREBBP gene by CGH array is available for those individuals in whom sequence analysis is negative.
- Sequence analysis of the EP300 gene is also 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.