### Condition Description

Peroxisomes are intracellular organelles with diverse cellular functions including biosynthesis, catabolism and detoxification of various compounds. Inborn errors of metabolism of peroxisomes function are roughly divided into peroxisome biogenesis disorders and single enzyme or transporter defects. This panel is designed for comprehensive testing for the following peroxisomal disorders:

1. Peroxisome biogenesis disorders, also called Zellweger syndrome spectrum (PBD, ZSS) that include Zellweger syndrome (ZS), neonatal adrenoleukodystrophy (NALD), and infantile Refsum disease (IRD).
2. X-linked adrenoleukodystrophy and adrenomyeloneuropathy.
3. Rhizomelic Chondrodysplasia Punctata, Types 1, 2, and 3.
4. Refsum Disease or phytanoyl-CoA hydroxylase deficiency.
5. Acyl-CoA oxidase (ACOX1) deficiency.
6. D-bifunctional protein (DBP) deficiency
7. 2-Methylacyl-CoA racemase (AMACR) deficiency.
8. Acatalasaemia.
9. Hyperoxaluria Type 1 or alanine glyoxylate aminotransferase deficiency.
10. Mulibrey nanism.
11. Sterol carrier protein X (SCP2) deficiency.
12. DNM1L-related encephalopathy.
13. ABCD3-related congential bile acid synthesis defect

Reference:


### Genes

- ABCD1, ABCD3, ACOX1, AGPS, AGXT, AMACR, CAT, DNM1L, GNPAT, HSD17B4, PEX1, PEX10, PEX11B, PEX12, PEX13, PEX14, PEX16, PEX19, PEX2, PEX26, PEX3, PEX5, PEX6, PEX7, PHYH, SCP2, TRIM37

### Indications

This test is indicated for:

- Confirmation of a clinical/biochemical diagnosis of peroxisomal disorders.
- Carrier testing in adults with a family history of peroxisomal disorders.

### 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:** Pathogenic variants in the PEX genes account for ~95% of individuals with PBD, ZSS. Pathogenic variants in the promoter region, some pathogenic variants in the introns and other regulatory element pathogenic variants 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
- 15µg
Isolation using the Perkin Elmer™ 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 24 hours of collection. Do not refrigerate or freeze.

**Type: Saliva**

**Specimen Requirements:**
Oragene™ Saliva Collection Kit
Orangene™ 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**
- Individual gene sequencing and deletion/duplication analysis are available for the following genes: ABCD1, PEX1, PEX2, PEX3, PEX5, PEX6, PEX12, PEX14, and PEX26
- Peroxisome Disorders: Deletion/Duplication Panel