

Fatty acid oxidation disorders

ANALYTE OR ENZYME	DISORDER(S)	GENE(S)
Low C0	Carnitine transporter deficiency Maternal carnitine transporter deficiency during NBS	SLC22A5 SLC22A5
Elevated C0; C0/C16+C18	Carnitine palmitoyltransferase I (CPT1) deficiency	CPT1A
Elevated C4	Short chain acyl-CoA dehydrogenase (SCAD) deficiency Ethylmalonic encephalopathy (EE) Isobutyryl-CoA dehydrogenase (IBDH) deficiency	ACADS ETHE1 ACAD8
Elevated C4-OH	Medium/short chain acyl-CoA dehydrogenase (M/SCHAD) deficiency 3-hydroxyisobutyryl-CoA hydrolase (HIBCH) deficiency	HADH HIBCH
Elevated C4, C5	Multiple acyl-CoA dehydrogenase deficiency (a.k.a glutaric acidemia type II) Ethylmalonic encephalopathy Riboflavin transporter deficiency	ETFA, ETFB, ETFDH ETHE1 SLC52A1, SLC52A2, SLC52A3
Elevated C8, C6, C10	Medium chain acyl-CoA dehydrogenase (MCAD) deficiency	ACADM
Elevated C14:1, C14	Very long chain acyl-CoA dehydrogenase (VLCAD) deficiency	ACADVL
Elevated C16, C16:1, C18, C18:1	Carnitine palmitoyltransferase II (CPT2) deficiency Carnitine-acylcarnitine translocase (CACT) deficiency	CPT2 SLC25A20
Elevated C16-OH +/- C18:1-OH and other long chains	Long chain 3-hydroxyacyl-CoA dehydrogenase (LCHAD) deficiency Trifunctional protein (TFP) deficiency	HADHA HADHA, HADHB

Organic acidemias

ANALYTE OR ENZYME	DISORDER(S)	GENE(S)
Elevated C3	Methylmalonic acidemia Propionic acidemia Maternal severe B12 deficiency during NBS	MUT, MMAA, MMAB, MMADHC, ABCD4, HCFC1, LMBRD1, MMACHC, MCEE PCCA, PCCB N/A
Elevated C3-DC	Malonic acidemia	MLYCD
Elevated C5	Isovaleric acidemia (IVA) Short-branched chain acyl-CoA dehydrogenase (SBCAD) deficiency Antibiotic related artifact (Pivalic acid derived)	IVD ACADSB N/A
Elevated C5-DC	Glutaric Acidemia type I (GA I)	GCDH
Elevated C5-OH	3-Methylcrotonyl-CoA carboxylase (3MCC) deficiency Maternal 3-methylcrotonyl-CoA carboxylase deficiency during NBS Beta-ketothiolase (BKT) deficiency Multiple carboxylase deficiency (MCD) Biotinidase deficiency Holocarboxylase deficiency (HCD) 3-Hydroxy-3-methylglutaryl (HMG)-CoA lyase deficiency 2-methyl-3-hydroxybutyric acidemia (2M3HBA) 3-Methylglutaconic aciduria (3MGA)	MCCC1, MCCC2 MCCC1, MCCC2 ACAT1 BTD, HLCS BTD HLCS HMGCL HSD17B10 AGK*, AUH, CLPB, DNAJC19, OPA3, SERAC1, TAZ, TMEM70

Aminoacidopathies and urea cycle disorders

ANALYTE OR ENZYME	DISORDER(S)	GENE(S)
Elevated arginine	Arginase deficiency	ARG1
Elevated citrulline	Argininosuccinate lyase deficiency (a.k.a. argininosuccinic aciduria) Citrullinemia type I Citrin deficiency Dihydrolipoamide dehydrogenase deficiency Pyruvate carboxylase deficiency	ASL ASS1 SLC25A13 DLD PC
Low citrulline	Ornithine transcarbamylase (OTC) deficiency Carbamoyl phosphate synthetase I (CPSI) deficiency N-acetylglutamate synthase (NAGS) deficiency	OTC CPS1 NAGS
Elevated leucine	Maple syrup urine disease	BCKDHA, BCKDHB, DBT, PPM1K
Elevated methionine	Cystathionine beta-synthase deficiency (a.k.a classic homocystinuria) Hypermethioninemia	CBS AHCY, GNMT, MAT1A
Elevated phenylalanine	Phenylalanine hydroxylase deficiency BH4 cofactor deficiency Phenylalanine, tyrosine, and tryptophan hydroxylases heat shock co-chaperone deficiency	PAH GCH1, PCBD1, PTS, QDPR, SPR DNAJC12*
Elevated proline	Hyperprolinemia	ALDH4A1, PRODH
Elevated succinylacetone	Tyrosinemia type I	FAH
Elevated tyrosine	Tyrosinemia type I, II, or III	FAH, HPD, TAT

Lysosomal storage disorders and other disorders

ANALYTE OR ENZYME	DISORDER(S)	GENE(S)
Low biotinidase	Biotinidase deficiency	BTD
Elevated total galactose	Galactosemia	GALT, GALE, GALK
Low GALT	Galactosemia due to galactose-1-phosphate uridylyltransferase (GALT) deficiency	GALT
Low G6PD	Glucose-6-phosphate dehydrogenase (G6PD) deficiency	G6PD
Low alpha-glucosidase	Pompe disease	GAA
Low galactocerebrosidase	Krabbe disease	GALC
Low alpha-galactosidase	Fabry disease	GLA
Low beta-glucocerebrosidase	Gaucher disease	GBA*
Low acid-sphingomyelinase	Niemann-Pick types A & B	SMPD1
Low iduronidase	Mucopolysaccharidosis type I	IDUA
Low iduronate-2-sulfatase	Mucopolysaccharidosis type II	IDS

*Testing for these genes is currently not available at Invitae.

All information based on published literature as of April 2017.

This table is based on the American College of Medical Genetics and Genomics ACT sheets (https://www.acmg.net/ACMG/Publications/ACT_Sheets_and_Confirmatory_Algorithms/NBS_ACT_Sheets_and_Algorithm_Table/ACMG/Publications/ACT_Sheets_and_Confirmatory_Algorithms/NBS_ACT_Sheets_and_Algorithms_Table.aspx?hkey=e2c16055-8cdc-4b22-a53b-b863622007c0), except where noted.

DLD PMID: 27896107, DNAJC12 PMID: 28132689, G6PD PMID: 20539275, HIBCH PMID: 26026795, MPS I PMID: 25444528, MPS II PMID: 26369786, SLC52A1, SLC52A2, SLC52A3 PMID: 21110228



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