UAB MEDICAL GENOMICS LABORATORY

Sanger Sequencing for Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCADD)

Ordering Information

Acceptable specimen types:

- Fresh blood sample (3-6 ml EDTA; no time limitations associated with receipt)
- Saliva (OGR-575 DNA Genotek; kits are provided upon request)
- DNA (extracted from lymphocyte cells; a minimum volume of 25µL at 3µg; O.D. of 260:280nm ≥1.8; must be extracted in a CLIA or equivalent certified lab)

Turnaround time:

15 working days

Price, CPT codes, and Z code:

$250 (USD – institutional/self-pay);

CPT: 81403, with reflex to 81406 as needed

Z code: ZB6AI

Candidates for this test:

Patients seeking confirmation of diagnosis for individuals with an abnormal acylcarnitine profile, hypoglycemic episodes, lethargy, seizures or a family history of MCADD

Specimen shipping and handling:

- Please find acceptable specimen type above.
- All submitted specimens must be sent at room temperature. DO NOT ship on ice.

720 Twentieth Street South, Suite 330 Phone: (205) 934-5562
Birmingham, Alabama 35294-0005 Fax: (205) 996-2929
www.uab.edu/medicine/genetics/medical-genomics-laboratory

- Specimens must be packaged to prevent breakage and absorbent material must be included in the package to absorb liquids in the event that breakage occurs. Also, the package must be shipped in double watertight containers (e.g. a specimen pouch + the shipping company's diagnostic envelope).
- To request a sample collection kit, please visit the website or email medgenomics@uabmc.edu to complete the specimen request form.
- Please contact the MGL (via email at medgenomics@uabmc.edu, or via phone at 205-934-5562) prior to sample shipment and provide us with the date of shipment and tracking number of the package so that we can better ensure receipt of the samples.

Required forms:

- Test Requisition Form
- Form for Customs (for international shipments)

Note: Detailed and accurate completion of this document is necessary for reporting purposes. The Medical Genomics Laboratory issues its clinical reports based on the demographic data provided by the referring institution on the lab requisition form. It is the responsibility of the referring institution to provide accurate information. If an amended report is necessary due to inaccurate or illegible documentation, additional reports will be drafted with charge.

Requests for testing may not be accepted for the following reasons:

- No label (patients full name and date of collection) on the specimens
- No referring physician's or genetic counselor's names and addresses
- No billing information
- DNA samples must be extracted in a CLIA or equivalent certified lab

For more information, test requisition forms, or sample collection and mailing kits, please call: 205-934-5562.

Disorder Background

MCADD is the most common enzyme deficiency in mitochondrial fatty acid ß-oxidation. In a typical clinical scenario, a previously healthy child presents with hypoketotic hypoglycemia, vomiting, and lethargy triggered by a common illness such as fasting or infection. Patients with MCADD also may present encephalopathy, hepatomegaly and acute liver disease, skeletal myopathy, and cardiomyopathy. Apparent life threatening events have also been linked to MCADD. Patients are normal at birth and typically present between three and 24 months of age; later presentation, even into adulthood, is possible. About 18-25% patients die during their first episode of illness. The prognosis is excellent once the diagnosis is established and frequent feedings are instituted to avoid any prolonged period of fasting.

ACADM is the only gene known to be associated with MCADD. It consists of 12 exons that span more than 44 kb and encodes a protein of 421 amino acids. The overall frequency of the disease has been estimated to range between 1:4,900 to 1:17,000, depending on the ethnic composition of the population. One mutation located in exon 11, c.985A>G, p.K329E, is present in approximately 80-90% of alleles in patients with MCADD based on newborn screening results in diverse population. The carrier frequency for the p.K329E mutation of the *ACADM* gene is between 1:40 and 1:100.

Test Description

For *ACADM* testing, we distinguish 2 types of test requests: targeted mutation analysis of the c.985A>G, p.K329E mutation (MCD2 testing) and comprehensive sequence analysis of the *ACADM* gene (MCD1 testing). MCD2 is the priority test for the MCADD patients, since the common mutation p.K329E in exon 11 of *ACADM* gene accounts for 80-90% of the mutant alleles. If the patient is heterozygous for the p.K329E mutation or does not carry this most frequent mutation, the comprehensive *ACADM* mutation analysis (MCD1 testing) is performed.

Parental testing is performed free of charge, if parental samples are submitted the same week as the sample of the proband. Parental testing will be performed at charge if parental samples are submitted at a later date.

REFERENCES available on website.

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