Test Definition: LRBA

LRBA Deficiency, B

Overview

Useful For

Aids in the diagnosis of lipopolysaccharide-responsive beige-like anchor protein (LRBA) deficiency

This test is **not useful for** identifying a carrier status for LRBA deficiency.

Genetics Test Information

The human lipopolysaccharide-responsive beige-like anchor protein (LRBA) gene is on chromosome 4.

Assessment of 109 patients with LRBA deficiency has shown 93 homozygous and 16 compound heterozygous alterations in the gene.

Alterations in the *LRBA* gene have been observed throughout the length of the gene and include the following main categories: Nonsense; missense; insertions, deletions, indels, and splice site alterations.

Highlights

The test determines the percentage and intensity of expression of lipopolysaccharide-responsive beige-like anchor (LRBA) protein on T cells and B cells in the peripheral blood.

It can be used as a screening step prior to genetic testing for *LRBA*; to confirm the finding of an established pathogenic alteration in *LRBA* at the protein level; and to examine the effect of reported genetic variants of undetermined significance (VUS) on LRBA protein expression.

It can help distinguish LRBA deficiency from conditions with overlapping clinical manifestations, including immune dysregulation and autoimmunity, such as immune dysregulation, polyendocrinopathy, enteropathy, X-linked (IPEX)-like syndromes; early onset hypogammaglobulinemia; common variable immune deficiency (CVID); inflammatory bowel disease (IBD); and autoimmune lymphoproliferative syndrome (ALPS).

Method Name

Flow Cytometry

NY State Available

Yes

Specimen

Specimen Type

Whole Blood EDTA

Advisory Information

This flow cytometry test is complementary to genetic testing.

Shipping Instructions

Specimens are required to be received in the laboratory weekdays and by 4 p.m. on Friday. Collect and package specimen as close to shipping time as possible.

It is recommended that specimens arrive within 24 hours of collection.

Samples arriving on the weekend and observed holidays may be canceled.

Necessary Information

Ordering physician name and phone number are required.

Specimen Required

Container/Tube: Lavender top (EDTA)

Specimen Volume: 3 mL

Collection Instructions: Send specimen in original tube. **Do not aliquot.**

Specimen Minimum Volume

1 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Whole Blood EDTA	Ambient	48 hours	PURPLE OR PINK TOP/EDTA

Clinical and Interpretive

Clinical Information

Lipopolysaccharide-responsive beige-like anchor protein (LRBA) deficiency is a rare autosomal recessive primary immunodeficiency disease (PID) caused by homozygous or compound heterozygous loss-of-function variants in the *LRBA* gene. It has a wide spectrum of clinical manifestations, including immune dysregulation and autoimmunity, inflammatory bowel disease (IBD), early-onset hypogammaglobulinemia, recurrent infections and organomegaly.

Reference Values

The appropriate reference values will be provided on the report.

Interpretation

The results are reported as the percentage and MFI (mean fluorescence intensity) of lipopolysaccharide-responsive beige-like anchor protein (LRBA) expression in T cells and B cells.

The majority of genetically confirmed cases of LRBA deficiency lead to the absence of LRBA expression. Therefore, the lack of LRBA expression in T and B cells is consistent with LRBA deficiency. In this case, genetic analysis of *LRBA* to confirm the diagnosis and to identify the underlying variant will be recommended.

In addition, there are reported cases of LRBA deficiency where the protein is expressed but at lower intensity. Therefore, the expression of LRBA at diminished intensity could be due to a pathogenic *LRBA* variant, which would

have to be confirmed or ruled out by genetic and functional analysis.

Cautions

No significant cautionary statements

Clinical Reference

1. Lopez-Herrera G, Tampella G, Pan-Hammarstrom Q, et al: Deleterious mutations in LRBA are associated with a syndrome of immune deficiency and autoimmunity. Am J Hum Genet. 2012;90:986-1001

2. Gamez-Diaz L, August D, Stepensky P, et al: The extended phenotype of LPS-responsive beige-like anchor protein (LRBA) deficiency. J Allergy Clin Immunol. 2016;137:223-230

3. Habibi S, Zaki-Dizaji M, Rafiemanesh H, et al: Clinical, immunologic, and molecular spectrum of patients with LPS-responsive beige-like anchor protein deficiency: A systematic review. J Allergy Clin Immunol Pract. 2019;7:2379-86 e5

4. Serwas NK, Kansu A, Santos-Valente E, et al: Atypical manifestation of LRBA deficiency with predominant IBD-like phenotype. Inflamm Bowel Dis. 2015;21:40-47

5. Revel-Vilk S, Fischer U, Keller B, et al: Autoimmune lymphoproliferative syndrome-like disease in patients with LRBA mutation. Clin Immunol. 2015;159:84-92

6. Kiykim A, Ogulur I, Dursun E, et al: Abatacept as a long-term targeted therapy for LRBA deficiency. J Allergy Clin Immunol Pract. 2019;7:2790-800 e15

7. Tesch VK, Abolhassani H, Shadur B, et al: Long-term outcome of LRBA deficiency in 76 patients after various treatment modalities as evaluated by the immune deficiency and dysregulation activity (IDDA) score. J Allergy Clin Immunol. 2020;145:1452-1463

Performance

Method Description

The lipopolysaccharide-responsive beige-like anchor (LRBA) protein expression assay is performed on EDTA whole blood. Samples are fixed, permeabilized and stained with antibodies specific for CD45, CD14, CD19, CD3, and CD56 along with either the LRBA antibody (unconjugated) or isotype control (unconjugated). A secondary reporter antibody is added to allow the assessment of LRBA and isotype control expression. Samples are then analyzed on a flow cytometer. LRBA expression is evaluated on the following populations: T-cells: (CD45+CD14negCD3+) and B-cells: (CD45+CD14negCD3negCD19+).(Unpublished Mayo method)

PDF Report

No

Specimen Retention Time

4 days

Performing Laboratory Location

Rochester

Fees and Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification

This test was developed using an analyte specific reagent. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information

86356 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
LRBA	LRBA Deficiency, B	In Process

Result ID	Test Result Name	Result LOINC Value
608960	%CD3+LRBA+	In Process
608964	MFI CD3+LRBA+	In Process
608961	%CD19+LRBA+	In Process
608965	MFI CD19+LRBA+	In Process
608968	LRBA Interpretation	69052-9