MAYO CLINIC LABORATORIES

Test Definition: VITB2

Riboflavin (Vitamin B2), Plasma

Overview

Useful For

Evaluation of individuals who present the signs of ariboflavinosis

Method Name

Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)
Portions of this test are covered by patents held by Quest Diagnostics

NY State Available

Yes

Specimen

Specimen Type

Plasma Heparin

Shipping Instructions

Ship specimen in amber vial to protect from light.

Specimen Required

Patient Preparation: Fasting-overnight (12-14 hours) (infants-collect specimen prior to next feeding)
Supplies: Amber Frosted Tube, 5 mL (T915)
Collection Container/Tube:
Preferred: Green top (sodium or lithium heparin)
Acceptable: Light-green top (sodium or lithium heparin plasma gel)
Submission Container/Tube: Amber vial
Specimen Volume: 2 mL
Collection Instructions: Centrifuge within 2 hours of collection and aliquot plasma into amber vial.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma Heparin	Ambient	72 hours	LIGHT PROTECTED
	Refrigerated (preferred)	28 days	LIGHT PROTECTED
	Frozen	28 days	LIGHT PROTECTED

Clinical & Interpretive

Clinical Information

There are 3 principal vitamin B2-active flavins found in nature: riboflavin, riboflavin 5-phosphate (flavin mononucleotide: FMN), and riboflavin-5'-adenosyl-diphosphate (flavin adenosine dinucleotide: FAD). In biological tissues, FMN and FAD serve as prosthetic groups for a large variety of flavoproteins, which are hydrogen carriers in oxidation-reduction processes.

Dietary deficiency of riboflavin (ariboflavinosis) is characterized by sore throat, cheilosis (lesions on the lips), angular stomatitis (lesions on the angles of the mouth), glossitis (fissured and magenta-colored tongue), corneal vascularization, dyssebacia (red, scaly, greasy patches on the nose, eyelids, scrotum, and labia), and normocytic, normochromic anemia. Severe riboflavin deficiency may affect the conversion of vitamin B6 to its coenzyme, as well as conversion of tryptophan to niacin.

There is also evidence that more subtle riboflavin deficiency might have negative health consequences.

Finally, in addition to dietary deficiency, there are rare inborn errors of metabolism, primarily involving loss of function of riboflavin transporters, which result in functional vitamin B2 deficiency. Many of these latter cases present with neurodegenerative features.

Riboflavin has a low level of toxicity and no case of riboflavin toxicity in humans has been reported. The limited absorptivity of riboflavin and its ready excretion in the urine normally preclude a health problem due to increased intake of riboflavin.

Reference Values

1-19 mcg/L

Interpretation

Low concentrations in the blood plasma are indicative of nutritional deficiency. Concentrations below 1 mcg/L are considered significantly diminished. Marginally low levels probably represent nutritional deficiency that should be corrected.

Cautions

Testing of nonfasting specimens or the use of dietary vitamin B2 supplementation can result in elevated plasma vitamin B2 concentrations.

Clinical Reference

1. McCormick DB. Riboflavin. In: Shils ME, Shike M, Ross AC, et al. Modern Nutrition in Health and Disease. 10th ed. Lippincott Williams and Wilkins; 2006:434-441

2. Hustad S, McKinley MC, McNulty H, et al. Riboflavin, flavin mononucleotide, and flavin adenine dinucleotide in human plasma and erythrocytes at baseline and after low-dose riboflavin supplementation. Clin Chem. 2002;48(9):1571-1577
3. Roberts NB. Taylor A. Sodi R. Vitamins and trace elements. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018:639-718
4. Balasubramaniam S, Christodoulou J, Rahman S. Disorders of riboflavin metabolism. J Inherit Metab Dis. 2019;42(4):608–619. doi:10.1002/jimd.12058
5. Suwannasom S, Kao I, PruB A, Georgieva R, Baumler H. Riboflavin: the health benefits of a forgotten natural vitamin. Int J Mol Sci. 2020;21(3):950. doi:10.3390/ijms21030950
6. O'Callaghan B, Bosch AM, Houlden H. An update on the genetics, clinical presentation, and pathomechanisms of human riboflavin transporter deficiency. J Inherit Metab Dis. 2019;42(4):598-607. doi:10.1002/jimd.12053

Performance

Method Description
Riboflavin (vitamin B2) is extracted from plasma heparin specimens with internal standard and then analyzed by liquid chromatography tandem mass spectrometry.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday, Wednesday, Friday

Report Available
2 to 5 days

Specimen Retention Time
2 weeks

Performing Laboratory Location
Rochester

Fees & 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 account representative. For assistance, contact Customer Service.

Test Classification
This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

84252

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VITB2	Riboflavin (Vitamin B2), P	2924-9

Result ID	Test Result Name	Result LOINC® Value
61637	Riboflavin (Vitamin B2), P	2924-9