MAYO CLINIC LABORATORIES

Test Definition: LH

Luteinizing Hormone (LH), Serum

Overview

Useful For

An adjunct in the evaluation of menstrual irregularities

Evaluating patients with suspected hypogonadism

Predicting ovulation

Evaluating infertility

Diagnosing pituitary disorders

Method Name

Electrochemiluminescence Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

1. The limit of quantitation for this test is 0.01 IU/L. In pediatric settings where greater analytical sensitivity is required, order LHPED / Luteinizing Hormone (LH), Pediatrics, Serum.
2. The preferred test to confirm menopausal status is FSH / Follicle-Stimulating Hormone (FSH), Serum.

Specimen Required

Patient Preparation: For 12 hours before specimen collection, patient **should not** take multivitamins or dietary supplements (eg, hair, skin, and nail supplements) containing biotin (vitamin B7).
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.6 mL
Collection Instructions: Within 2 hours of collection, centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Ambient	24 hours	
	Frozen	180 days	

Clinical & Interpretive

Clinical Information

Luteinizing hormone (LH) is a glycoprotein hormone consisting of 2 noncovalently bound subunits (alpha and beta). The alpha subunit of LH, follicle-stimulating hormone (FSH), thyrotropin (formerly known as thyroid-stimulating hormone), and human chorionic gonadotropin (hCG) are identical and contain 92 amino acids. The beta subunits of these hormones vary and confer the hormones' specificity. LH has a beta subunit of 121 amino acids and is responsible for interaction with the LH receptor. This beta subunit contains the same amino acids in sequence as the beta subunit of hCG, and both stimulate the same receptor; however, the hCG-beta subunit contains an additional 24 amino acids, and the hormones differ in the composition of their sugar moieties. Gonadotropin-releasing hormone from the hypothalamus controls the secretion of the gonadotropins, FSH, and LH, from the anterior pituitary.

In both male and female populations, LH is essential for reproduction. In girls and women, the menstrual cycle is divided by a midcycle surge of both LH and FSH into a follicular phase and a luteal phase. This "LH surge" triggers ovulation thereby not only releasing the egg but also initiating the conversion of the residual follicle into a corpus luteum that, in turn, produces progesterone to prepare the endometrium for a possible implantation. LH is necessary to maintain luteal function for the first 2 weeks. In case of pregnancy, luteal function will be further maintained by the action of hCG (a hormone very similar to LH) from the newly established pregnancy. LH supports thecal cells in the ovary that provide androgens and hormonal precursors for estradiol production. LH in boys and men acts on testicular interstitial cells of Leydig to cause increased synthesis of testosterone.

Reference Values

Males

< or =4 weeks: Not established

>1 month-< or =12 months: < or =0.4 IU/L

>12 months-< or =6 years: < or =1.3 IU/L

>6-< or =11 years: < or =1.4 IU/L
>11-< or =14 years: 0.1-7.8 IU/L
>14-< or =18 years: 1.3-9.8 IU/L
>18 years: 1.3-9.6 IU/L

Females
< or =4 weeks: Not established
>1-< or =12 months: < or =0.4 IU/L
>12 months-< or =6 years: < or =0.5 IU/L
>6-< or =11 years: < or =3.1 IU/L
>11-< or =14 years: < or =11.9 IU/L
>14-< or =18 years: 0.5-41.7 IU/L

Premenopausal:
Follicular: 1.9-14.6 IU/L
Midcycle: 12.2-118.0 IU/L
Luteal: 0.7-12.9 IU/L
Postmenopausal: 5.3-65.4 IU/L

Interpretation

In both male and female patients, primary hypogonadism results in an elevation of basal follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels.

Postmenopausal LH levels are generally above 40 IU/L.

FSH and LH are generally elevated in:
-Primary gonadal failure
-Complete testicular feminization syndrome
-Precocious puberty (either idiopathic or secondary to a central nervous system lesion)
In female patients:
-Menopause
-Primary ovarian hypodysfunction
-Polycystic ovary disease
In male patients:
-Primary hypogonadism

LH is decreased in:
-Primary ovarian hyperfunction in female patients
-Primary hypergonadism in male patients

FSH and LH are both decreased in failure of the pituitary or hypothalamus.

Cautions

No clinically significant cross-reactivity has been demonstrated with follicle-stimulating hormone, thyrotropin, or human chorionic gonadotropin.

Some patients who have been exposed to animal antigens, either in the environment or as part of treatment or imaging procedures, may have circulating anti-animal antibodies present. These antibodies may interfere with the assay reagents to produce unreliable results.

Clinical Reference

1. Kaplan LA, Pesce AJ. The gonads. In: Kazmierczak SC, ed. Clinical Chemistry: Theory, Analysis, and Correlation. 3rd ed. Mosby-Year Book, Inc; 1996:894
2. Dumesic DA. Hyperandrogenic anovulation: a new view of polycystic ovary syndrome. Postgrad Ob Gyn. 1995;15:1-5
3. Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018

Performance

Method Description

In the Roche luteinizing hormone (LH) assay, the determination of the LH level is made with the aid of a biotinylated monoclonal LH-specific antibody and a monoclonal LH-specific antibody labeled with a ruthenium complex, which form a sandwich complex. After addition of streptavidin-coated microparticles, the complex becomes bound to the solid phase via interaction of biotin and streptavidin. The reaction mixture is aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode. Unbound substances are then removed with ProCell. Application of a voltage to the electrode then induces a chemiluminescent emission, which is measured by a photomultiplier.(Package insert: LH. Roche Diagnostics; 03/2024)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 to 3 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

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 has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

83002

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
LH	Luteinizing Hormone (LH), S	10501-5

Result ID	Test Result Name	Result LOINC® Value
LH	Luteinizing Hormone (LH), S	10501-5