## 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**

### Advisory Information
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 do not take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.

**Container/Tube:**

- **Preferred:** Serum gel
- **Acceptable:** Red top

**Specimen Volume:** 0.6 mL

**Collection Instructions:** Centrifuge and aliquot serum within 2 hours of collection.

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

### Specimen Minimum Volume
0.5 mL
Test Definition: LH
Luteinizing Hormone (LH), S

Reject Due To

<table>
<thead>
<tr>
<th>Gross hemolysis</th>
<th>Reject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross lipemia</td>
<td>OK</td>
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</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
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<tbody>
<tr>
<td>Serum</td>
<td>Refrigerated (preferred)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>180 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient</td>
<td>24 hours</td>
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Clinical and Interpretive

Clinical Information

Luteinizing hormone (LH) is a glycoprotein hormone consisting of 2 non-covalently bound subunits (alpha and beta). The alpha subunit of LH, follicle-stimulating hormone (FSH), thyrotropin (formerly known as thyroid-stimulating hormone: TSH), 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 males and females, LH is essential for reproduction. In females, 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 males 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
Test Definition: LH
Luteinizing Hormone (LH), S

>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 males and females, 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)
- Menopause
- Primary ovarian hypodysfunction in females
- Polycystic ovary disease in females
- Primary hypogonadism in males

LH is decreased in:
Test Definition: LH  
Luteinizing Hormone (LH), S

- Primary ovarian hyperfunction in females
- Primary hypergonadism in males

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 (FSH), thyrotropin (TSH), or human chorionic gonadotropin (hCG).

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


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 chemiluminescent emission that is measured by a photomultiplier. (Package insert: LH. Roche Diagnostics; 03/2019)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Sunday; Continuously

Analytic Time

Same day/1 day

Maximum Laboratory Time

2 days

Specimen Retention Time

7 days

Performing Laboratory Location
**Test Definition: LH**
Luteinizing Hormone (LH), S

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**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 has been cleared, approved or is exempt by the U.S. 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**

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<th>Order LOINC Value</th>
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<tr>
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<td>Luteinizing Hormone (LH), S</td>
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<table>
<thead>
<tr>
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<th>Test Result Name</th>
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<td>LH</td>
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