Alinity i LH-19

Prepared by: Yusra Othman /Director/Supervisor-Chem **Date:** May/26/2024
signature/title

Reviewed by: Jordan Dillard /Instructor **Date:** June 26 2024
signature/title

Approved by: Stanford N. Gandy, M.D /Chairman **Date:** June 28 2024
signature/title

BIENNIAL REVIEW:

REVIEWED	signature/title	Date
REVIEWED	signature/title	Date
REVIEWED	signature/title	Date
REVIEWED	signature/title	Date
REVIEWED	signature/title	Date
REVIEWED	signature/title	Date

REVISED	signature/title	Date/Page/Paragraph
REVISED	signature/title	Date/Page/Paragraph
REVISED	signature/title	Date/Page/Paragraph
REVISED	signature/title	Date/Page/Paragraph
REVISED	signature/title	Date/Page/Paragraph

SUPERSEDES: Procedure titled _____

INTENDED USE

The Alinity i LH assay is a chemiluminescent microparticle immunoassay (CMIA) used for the quantitative determination of human luteinizing hormone (LH) in human serum and plasma on the Alinity i analyzer.

SUMMARY AND EXPLANATION OF THE TEST

Human luteinizing hormone (LH, lutropin) is a glycoprotein hormone with two dissimilar subunits (α and β). The α-subunit is essentially identical to the α-subunits of follicle stimulating hormone (FSH, follitropin), thyroid stimulating hormone (TSH, thyrotropin), and

human chorionic gonadotropin (hCG).[1, 2, 3, 4] The β-subunit is considerably different from that of FSH and TSH.[1, 4, 5] However, the β-subunits of LH and hCG are very similar.[1, 5, 6]

LH, together with FSH, is secreted by the gonadotroph cells in the pituitary[5, 7] in response to the secretion of the gonadotropin releasing hormone (LHRH, GnRH) from the medial basal hypothalamus.[8, 9, 10] Ovarian steroids, principally estrogens, modulate the secretion of LH and FSH which in turn regulate the menstrual cycle in females. When the follicle and the ovum contained within it, reach maturity, a surge of LH causes the follicle to rupture releasing the ovum. The follicular remnant is transformed into a corpus luteum, which secretes progesterone and estradiol. During the follicular and luteal phases, LH concentrations are much lower than the levels observed at the time of the LH surge. During the follicular and luteal phases, the estrogens exert a negative feedback on the release of LH. Shortly before the mid-cycle surge in LH, ovarian steroids, specifically estradiol, exert a positive feedback on the release of LH.[11, 12, 13]

Determination of the concentration of LH is essential for the prediction of ovulation, in the evaluation of infertility, and the diagnosis of pituitary and gonadal disorders.[11, 14] Increasing concentrations of LH precede ovulation and in cases in which the period of optimal fertility needs to be defined for the timing of intercourse or artificial insemination, daily concentrations of LH are important for the prediction of ovulation. More frequent sampling is required if the precise time of follicular rupture is needed for egg aspiration for *in vitro* fertilization.[15]

At menopause, or following ovariectomy in women, concentrations of estrogens decline to low levels. The lowered concentrations of estrogens result in a loss of the negative feedback on gonadotropin release. The consequence is an increase in the concentrations of LH and FSH.[11, 15, 16]

The primary role of LH in the male is to stimulate the production of testosterone by the Leydig cells. LH, through the production of testosterone together with FSH, regulates spermatogenesis in the Sertoli cells of the seminiferous tubules of the testes. Testosterone exerts a negative feedback on the release of LH.[14]

In sexually mature adults, gonadotropin deficiency is usually an early indication of the development of panhypopituitarism. Low concentrations of LH, FSH, and steroids are observed with this disorder. In contrast, gonadotropin secreting tumors of the hypothalamus and pituitary result in elevated concentrations of LH and FSH.[15]

Gonadal failure, a cause of infertility, is indicated by elevated concentrations of LH and FSH accompanied by low concentrations of gonadal steroids.[11, 14, 15] In the female, elevated concentrations of LH can indicate primary amenorrhea,[11] menopause,[11, 15, 16] premature ovarian failure,[15, 17] polycystic ovarian syndrome,[17, 18] hypergonadotropic hypogonadism,[11, 15] or ovulation. In the male, elevated concentrations of LH can result from primary testicular failure, seminiferous tubule dysgenesis (Klinefelter's syndrome), Sertoli cell failure, anorchia, or hypergonadotropic hypogonadism.[19, 20]

BIOLOGICAL PRINCIPLES OF THE PROCEDURE

This assay is a two-step immunoassay for the quantitative determination of luteinizing hormone (LH) in human serum and plasma using chemiluminescent microparticle immunoassay (CMIA) technology.

Sample and anti-β LH coated paramagnetic microparticles are combined and incubated. The LH present in the sample binds to the anti-β LH coated microparticles. The mixture is washed. Anti-α LH acridinium-labeled conjugate is added to create a reaction mixture and incubated. Following a wash cycle, Pre-Trigger and Trigger Solutions are added.

The resulting chemiluminescent reaction is measured as relative light units (RLUs). There is a direct relationship between the amount of LH in the sample and the RLUs detected by the system optics.

For additional information on system and assay technology, **refer to the Alinity ci-series Operations Manual, Section 3.**

REAGENTS

Kit Contents

Alinity i LH Reagent Kit 07P91

Volumes (mL) listed in the table below indicate the volume per cartridge.

REF	07P9120	07P9130
Tests per cartridge	100	600
Number of cartridges per kit	2	2
Tests per kit	200	1200
MICROPARTICLES	6.6 mL	32.1 mL
CONJUGATE	31.6 mL	31.6 mL

MICROPARTICLES Anti-β LH (mouse, monoclonal) antibody coated microparticles in HEPES buffer with protein (bovine, mouse) stabilizers. Minimum concentration: 0.04% solids. Preservative: ProClin 300.

CONJUGATE Anti-α LH (mouse, monoclonal) acridinium-labeled conjugate in MES buffer with protein (bovine, casein) stabilizers. Minimum concentration: 170 ng/mL. Preservatives: ProClin 300 and ProClin 950.

Warnings and Precautions

- IVD
- For *In Vitro* Diagnostic Use
- Rx ONLY

Safety Precautions

CAUTION: This product requires the handling of human specimens. It is recommended that all human-sourced materials be considered potentially infectious and handled in accordance with the OSHA Standard on Bloodborne Pathogens. Biosafety Level 2 or other appropriate

biosafety practices should be used for materials that contain or are suspected of containing infectious agents.[21], [22], [23], [24]

The following warnings and precautions apply to: MICROPARTICLES / CONJUGATE	
	
WARNING	Contains methylisothiazolones.
H317	May cause an allergic skin reaction.
Prevention	
P261	Avoid breathing mist / vapors / spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves / protective clothing / eye protection.
Response	
P302+P352	IF ON SKIN: Wash with plenty of water.
P333+P313	If skin irritation or rash occurs: Get medical advice / attention.
P362+P364	Take off contaminated clothing and wash it before reuse.
Disposal	
P501	Dispose of contents / container in accordance with local regulations.

Safety Data Sheets are available at www.abbottdiagnostics.com or/and SDS folder.

For a detailed discussion of safety precautions during system operation**, refer to the Alinity ci-series Operations Manual, Section 8.**

Reagent Handling

- Reagents are shipped on wet ice or frozen gel packs.
- Upon receipt, gently invert the unopened reagent kit by rotating it over and back for a full 180 degrees, 5 times with green label stripe facing up and then 5 times with green label stripe facing down. This ensures that liquid covers all sides of the bottles within the cartridges. During reagent shipment, microparticles can settle on the reagent septum.
- Place a check in the square on the reagent kit to indicate to others that the inversions have been completed.
- After mixing, place reagent cartridges in an upright position for 1 hour before use to allow bubbles that may have formed to dissipate.

- If a reagent cartridge is dropped, place in an upright position for 1 hour before use to allow bubbles that may have formed to dissipate.
- Reagents are susceptible to the formation of foam and bubbles. Bubbles may interfere with the detection of the reagent level in the cartridge and cause insufficient reagent aspiration that may adversely affect results.

For a detailed discussion of reagent handling precautions during system operation, refer to the Alinity ci-series Operations Manual, Section 7.

Reagent Storage

	Storage Temperature	Maximum Storage Time	Additional Storage Instructions
Unopened	2 to 8°C	Until expiration date	Store in upright position. If cartridge does not remain upright, gently invert the cartridge 10 times and place in an upright position for 1 hour before use.
Onboard	System Temperature	30 days	
Opened	2 to 8°C	Until expiration date	Store in upright position. If cartridge does not remain upright during storage, discard the cartridge. Do not reuse original reagent caps or replacement caps due to the risk of contamination and the potential to compromise reagent performance.

Reagents may be stored on or off the system. If removed from the system, store reagents with new replacement caps in an upright position at 2 to 8°C. For reagents stored off the system, it is recommended that they be stored in their original trays or boxes to ensure they remain upright.

For information on unloading reagents, **refer to the Alinity ci-series Operations Manual, Section 5.**

Indications of Reagent Deterioration

Deterioration of the reagents may be indicated when:

a calibration error occurs

a control value is out of the specified range

Associated test results are invalid, and samples must be retested. Assay recalibration may be necessary.

For troubleshooting information, **refer to the Alinity ci-series Operations Manual, Section 10.**

INSTRUMENT PROCEDURE

The Alinity i LH assay file must be installed on the Alinity i analyzer prior to performing the assay.

For detailed information on assay file installation and viewing and editing assay parameters, **refer to the Alinity ci-series Operations Manual, Section 2.**

For information on printing assay parameters, **refer to the Alinity ci-series Operations Manual, Section 5.**

For a detailed description of system procedures, **refer to the Alinity ci-series Operations Manual.**

Alternate Result Units

Edit assay parameter "Result Units" to select an alternate unit.

Conversion formula:

(Concentration in Default result unit) x (Conversion factor) = (Concentration in Alternate result unit)

Default Result Unit	Conversion Factor	Alternate Result Unit
mIU/mL	1	IU/L

SPECIMEN COLLECTION AND PREPARATION FOR ANALYSIS

Specimen Types

The specimen types listed below were verified for use with this assay.

Specimen Types	Collection Tubes
Serum	Serum Serum separator
Plasma	Potassium EDTA Sodium heparin

- Liquid anticoagulants may have a dilution effect resulting in lower concentration values for individual specimens.

Specimen Conditions

Do not use:

- heat-inactivated specimens

- pooled specimens
- grossly hemolyzed specimens
- specimens with obvious microbial contamination

· For accurate results, serum and plasma specimens should be free of fibrin, red blood cells, and other particulate matter. Serum specimens from patients receiving anticoagulant or thrombolytic therapy may contain fibrin due to incomplete clot formation.

· To prevent cross contamination, use of disposable pipettes or pipette tips is recommended.

Preparation for Analysis

· Follow the tube manufacturer's processing instructions for collection tubes. Gravity separation is not sufficient for specimen preparation.

· Specimens should be free of bubbles. Remove bubbles with an applicator stick before analysis. Use a new applicator stick for each specimen to prevent cross-contamination.

To ensure consistency in results, recentrifuge specimens prior to testing if

· they contain fibrin, red blood cells, or other particulate matter

· they require repeat testing.

NOTE: If fibrin, red blood cells, or other particulate matter are observed, mix by low speed vortex or by inverting 10 times prior to recentrifugation.

Prepare frozen specimens as follows:

· Frozen specimens must be completely thawed before mixing.

· Mix thawed specimens thoroughly by low speed vortex or by inverting 10 times.

· Visually inspect the specimens. If layering or stratification is observed, mix until specimens are visibly homogeneous.

· If specimens are not mixed thoroughly, inconsistent results may be obtained.

· Recentrifuge specimens.

Recentrifugation of Specimens

· Transfer specimens to a centrifuge tube and centrifuge at a minimum of 100 000 g-minutes.

· Examples of acceptable time and force ranges that meet this criterion are listed in the table below.

Centrifugation time using alternate RCF values can be calculated using the following formula:

$$\text{Minimum Centrifugation time (minutes)} = \frac{100\,000 \text{ g-minutes}}{\text{RCF}}$$

Recentrifugation Time (Minutes)	RCF (x g)*	g-Minutes
10	10 000	100 000
20	5000	100 000
40	2500	100 000

* To ensure consistency in results, specimens must be centrifuged using an appropriate tube at a minimum of 2500 RCF to obtain a minimum of 100 000 g-minutes.

$RCF = 1.12 \times r_{max} (rpm/1000)^2$

RCF - The relative centrifugal force generated during centrifugation.

rpm - The revolutions per minute of the rotor on which the specimens are being spun (usually the digital readout on the centrifuge will indicate the rpm).

Centrifugation Time - The time should be measured from the time the rotor reaches the required RCF or rpm to the time it begins decelerating.

r_{max} - Radius of the rotor in millimeters. NOTE: If custom tube adapters (i.e., adapters not defined by the centrifuge manufacturer) are used, then the radius (r_{max}) should be manually measured in millimeters and the RCF calculated.

g-minutes - The unit of measure for the product of RCF (× g) and centrifugation time (minutes).

- Transfer clarified specimen to a sample cup or secondary tube for testing. For centrifuged specimens with a lipid layer, transfer only the clarified specimen and not the lipemic material.

Specimen Storage

Specimen Type	Temperature	Maximum Storage Time	Special Instructions
Serum/Plasma	2 to 8°C	7 days	If testing will be delayed more than 24 hours, remove serum or plasma from the clot, red blood cells, or separator gel.

If testing will be delayed more than 7 days, store frozen (-10°C or colder).

Specimens that encountered three freeze/thaw cycles showed no performance difference.

Avoid multiple freeze/thaw cycles.

Specimen Shipping

Package and label specimens in compliance with applicable state, federal, and international regulations covering the transport of clinical specimens and infectious substances.

PROCEDURE

Materials Provided

07P91Alinity i LH Reagent Kit

Materials Required but not Provided

- Alinity i LH assay file
- 07P9101 Alinity i LH Calibrators
- Commercially available controls containing LH
- 09P1540 Alinity i Multi-Assay Manual Diluent
- Alinity Trigger Solution
- Alinity Pre-Trigger Solution
- Alinity i-series Concentrated Wash Buffer

For information on materials required for operation of the instrument, **refer to the Alinity ci-series Operations Manual, Section 1.**

For information on materials required for **maintenance procedures, refer to the Alinity ci-series Operations Manual, Section 9.**

Assay Procedure

For a detailed description of how to run an assay, **refer to the Alinity ci-series Operations Manual, Section 5.**

- If using primary or aliquot tubes, refer to the Alinity ci-series Operations Manual, Section 4 to ensure sufficient specimen is present.
- To minimize the effects of evaporation, verify adequate sample cup volume is present prior to running the test.

Maximum number of replicates sampled from the same sample cup: 10

Priority:

- Sample volume for first test: 75 µL
- Sample volume for each additional test from same sample cup: 25 µL

≤ 3 hours on the reagent and sample manager:

- Sample volume for first test: 150 µL
- Sample volume for each additional test from same sample cup: 25 µL

> 3 hours on the reagent and sample manager:

- Replace with a fresh aliquot of sample.

- Refer to the Alinity i LH calibrator package insert and the package insert for the commercially available controls containing LH for preparation and usage.
- For general operating procedures, refer to the Alinity ci-series Operations Manual, Section 5.
- For optimal performance, it is important to perform routine maintenance as described in the Alinity ci-series Operations Manual, Section 9. Perform maintenance more frequently when required by laboratory procedures.

Sample Dilution Procedures

Samples with a LH value exceeding 250.00 mIU/mL (250.00 IU/L) are flagged with the code "> 250.00 mIU/mL" (">250.00 IU/L") and may be diluted with either the Automated Dilution Protocol or the Manual Dilution Procedure.

Only specimens with a concentration of greater than 2.00 mIU/mL (2.00 IU/L) should be diluted.

Automated Dilution Protocol

The system performs a **1:4** dilution of the sample and automatically calculates the concentration by multiplying the result by the dilution factor.

Specimens exceeding 1000.00 mIU/mL (1000.00 IU/L) are flagged with the code ">1000.00 mIU/mL" (">1000.00 IU/L") when run using the Automated Dilution Protocol.

Manual Dilution Procedure

Suggested dilution: 1:4

It is recommended that dilutions not exceed 1:4.

Add 40 µL of the sample to 120 µL of Alinity i Multi-Assay Manual Diluent.

The operator must enter the dilution factor in the Specimen or Control tab of the Create Order screen. The system will use this dilution factor to automatically calculate the concentration of the sample and report the result. The result should be > 0.50 mIU/mL (> 0.50 IU/L) before the dilution factor is applied.

If the operator does not enter the dilution factor, the result must be manually multiplied by the appropriate dilution factor before reporting the result. If a diluted sample result is less than or equal to 0.50 mIU/mL (0.50 IU/L), do not report the result. Rerun using an appropriate dilution.

For detailed information on ordering dilutions, refer to the Alinity ci-series Operations Manual, Section 5.

Calibration

For instructions on performing a calibration, **refer to the Alinity ci-series Operations Manual, Section 5.**

Each assay control must be tested to evaluate the assay calibration.

Once a calibration is accepted and stored, all subsequent samples may be tested without further calibration unless:

- A reagent kit with a new lot number is used.

Daily quality control results are outside of statistically-based quality control limits used to monitor and control system performance, as described in the Quality Control Procedures section of this package insert.

- **If statistically-based quality control limits are not available**, then the calibration **should not exceed a 30-day limit** for recalibration frequency.

This assay may require recalibration after maintenance to critical parts or subsystems or after service procedures have been performed.

Quality Control Procedures

The recommended control requirement for the Alinity i LH assay is that a single sample of each control level be tested once every day testing performed.

To establish statistically-based control limits, each laboratory should establish its own concentration target and ranges for new control lots at each clinically relevant control level. This can be accomplished by assaying a minimum of **20 replicates over several (3-5) days** and using the reported results to establish the expected average (target) and variability about this average (range) for the laboratory. Sources of variation that should be included in this study in order to be representative of future system performance include:

- Multiple stored calibrations
- Multiple reagent lots
- Multiple calibrator lots
- Multiple processing modules (if applicable)
- Data points collected at different times of the day

Refer to published guidelines for information or general control recommendation, for example Clinical and Laboratory Standards Institute (CLSI) Document C24-A3 or other published guidelines, for general quality control recommendations.[25]

- If quality control results do not meet the acceptance criteria defined by laboratory QC procedure, sample results may be suspect. Follow the established quality control procedures to troubleshoot. Recalibration may be necessary. For troubleshooting information, **refer to the Alinity ci-series Operations Manual, Section 10.**
- Review quality control results and acceptance criteria following a change of reagent or calibrator lot.

Commercial controls should be used according to the guidelines and recommendations of the control manufacturer. Concentration ranges provided in the control package insert should be used only for guidance.

For any control material in use, the laboratory should ensure that the matrix of the control material is suitable for use in the assay per the assay package insert.

Quality Control Guidance

Refer to "Basic QC Practices" by James O Westgard, Ph.D. for guidance on laboratory quality control practices.[26]

Verification of Assay Claims

For protocols to verify package insert claims, refer to Verification of Assay Claims in the Alinity ci-series Operations Manual.

RESULTS

Calculation

The Alinity i LH assay utilizes a 4 Parameter Logistic Curve fit data reduction method (4PLC, Y-weighted) to generate a calibration and results.

For information on alternate result units, refer to the INSTRUMENT PROCEDURE, Alternate Result Units section of this package insert.

Flags

Some results may contain information in the Flags field. For a description of the flags that may appear in this field, refer to the Alinity ci-series Operations Manual, Section 5.

Measuring Interval

Measuring interval is defined as the range of values in mIU/mL (IU/L) which meets the limits of acceptable performance for linearity, imprecision, and bias.

The measuring interval of the Alinity i LH assay is **0.12 to 250.00 mIU/mL** (0.12 to 250.00 IU/L).

LIMITATIONS OF THE PROCEDURE

- Results should be used in conjunction with other data; e.g., symptoms, results of other tests, and clinical impressions.
- If the LH results are inconsistent with clinical evidence, additional testing is recommended to confirm the result.
- Specimens from patients who have received preparations of mouse monoclonal antibodies for diagnosis or therapy may contain human anti-mouse antibodies (HAMA). Such specimens may show either falsely elevated or depressed values when tested with assay kits such as Alinity i LH that employ mouse monoclonal antibodies. Additional information may be required for diagnosis.[27, 28]
- Heterophilic antibodies in human serum can react with reagent immunoglobulins, interfering with *in vitro* immunoassays. Patients routinely exposed to animals or to animal serum products can be prone to this interference, and anomalous values may be observed. Additional information may be required for diagnosis.[29]

EXPECTED VALUES

This study was performed on the ARCHITECT i System.

Representative performance data are provided in this section. Results obtained in individual laboratories may vary.

Manufacturers provided reference ranges are adopted..

The suggested normal range for this assay represents the LH values obtained from 199 normal males, 124 postmenopausal females (not on hormone replacement therapy - HRT), and 64 normally menstruating females. For this study, the follicular phase was defined as the period of time from 10 to 4 days prior to the mid-cycle peak. The luteal phase was defined as the period of time from 4 to 10 days following the mid-cycle peak. Cycle days were synchronized to the mid-cycle peak, the day on which the LH concentration was most elevated. The results are presented in the following table.

		LH Values (mIU/mL)		
			Central 95% of Data	
	n	**Median/Mean***	**Lower Limit**	**Upper Limit**
Normal Males	199	2.96	0.57	12.07
Normally Menstruating Females				
Follicular Phase	303	3.98	1.80	11.78
Mid-Cycle Peak	64	26.00*	7.59	89.08
Luteal Phase	294	2.79*	0.56	14.00
Postmenopausal Females				
Without HRT	124	25.73*	5.16	61.99

* indicates that a mean was calculated.

SPECIFIC PERFORMANCE CHARACTERISTICS

Representative performance data are provided in this section. Results obtained in individual laboratories may vary.

The Alinity i analyzer and the ARCHITECT i System utilize the same reagents and sample/reagent ratios.

Unless otherwise specified, all studies were performed on the Alinity i analyzer.

Precision

Within-Laboratory Precision

A study was performed based on guidance from CLSI EP05-A2.[30] Testing was conducted using 1 lot of the Alinity i LH Reagent Kit, 1 lot of the Alinity i LH Calibrators, and 1 instrument. Six human serum panels were assayed in a minimum of 2 replicates at 2 separate times per day on 20 different days.

		Mean (mIU/mL)	Within-Run (Repeatability)		Within-Laboratory (Total)[a]	
Sample	**n**	**(IU/L)**	**SD**	**%CV**	**SD**	**%CV**
Panel 1	120	3.31	0.068	2.0	0.093	2.8
Panel 2	120	13.30	0.327	2.5	0.406	3.0
Panel 3	120	40.05	0.940	2.3	1.113	2.8
Panel 4	119	206.12	8.845	4.3	9.692	4.7
Panel 5	120	0.71	0.021	3.0	0.025	3.5
Panel 6	120	83.33	2.405	2.9	2.791	3.3

[a]Includes within-run, between-run, and between-day variability.

Lower Limits of Measurement

A study was performed based on guidance from CLSI EP17-A2.[31] Testing was conducted using 3 lots of the Alinity i LH Reagent Kit on each of 2 instruments over a minimum of 3 days. The maximum observed Limit of Blank (LoB), Limit of Detection (LoD), and Limit of Quantitation (LoQ) values are summarized below.

	mIU/mL **IU/L**
LoB[a]	0.02
LoD[b]	0.04
LoQ[c]	**0.12**

[a]The LoB represents the 95th percentile from n ≥ 60 replicates of zero-analyte samples.

[b]The LoD represents the lowest concentration at which the analyte can be detected with 95% probability based on n ≥ 60 replicates of low-analyte level samples.

[c] The LoQ was determined from n ≥ 60 replicates of low-analyte level samples and is defined as the lowest concentration at which a total allowable error of 22% was met.

Linearity

A study was performed based on guidance from CLSI EP06-A.[32]

This assay is linear across the measuring interval of **0.12 to 250.00** mIU/mL (0.12 to 250.00 IU/L).

Analytical Specificity

This study was performed on the ARCHITECT i System.

The specificity of the ARCHITECT LH assay was determined by studying potential cross-reacting hormones (FSH at 150 mIU/mL, TSH at 100 µIU/mL, and hCG at 200 000 mIU/mL).

A study was performed with the ARCHITECT LH assay. Aliquots of ARCHITECT LH Calibrator A, containing essentially no LH (0 mIU/mL), as well as a pool of normal male serum (≤ 10 mIU/mL) and spiked normal male serum samples (50‑70 mIU/mL) were supplemented with potential cross-reactants at the concentrations listed and tested for LH. Data from the study are listed in the following table.

Cross-Reactant	Cross-Reactant Concentration	LH Analyte Level mIU/mL	% Cross-Reactivity[a]
FSH	169 mIU/mL	0	0.01
	179 mIU/mL	≤ 10	0.00
	162 mIU/mL	50-70	0.15
TSH	124 µIU/mL	0	0.00
	126 µIU/mL	≤ 10	0.01
	137 µIU/mL	50-70	-0.69
hCG	209 770 mIU/mL	0	0.01
	218 532 mIU/mL	≤ 10	0.01
	206 844 mIU/mL	50-70	0.01

$$[a]\ \%\ \text{Cross-Reactivity} = \frac{\text{mean LH test concentration} - \text{mean LH reference concentration}}{\text{concentration of cross-reactant}} \times 100$$

Interference

These studies were performed on the ARCHITECT i System.

Potentially Interfering Endogenous Substances

A study was performed based on guidance from CLSI EP07-A2.[33]

Potentially Interfering Substance	Concentration	% Change in Measured LH Concentration	
		10-20 mIU/mL	50-70 mIU/mL
Bilirubin	≥ 20 mg/dL	0	-1
Protein	≥ 12 g/dL	-8	-8
Triglycerides	≥ 3000 mg/dL	0	-2
Hemoglobin	≥ 500 mg/dL	1	0

Potentially Interfering Other Conditions

Rheumatoid Factor (RF) or Human anti-mouse antibodies (HAMA) samples spiked with known amounts of LH across the range of 10 to 70 mIU/mL were evaluated.

Potentially Interfering Substance	Mean % Recovery		
	10-20 mIU/mL	50-70 mIU/mL	Overall
HAMA	101	97	99
RF	97	90	94

Method Comparison

A study was performed based on guidance from CLSI EP09-A3 using the Passing-Bablok regression method.[34]

		Units	n	Correlation Coefficient	Intercept	Slope	Concentration Range
Alinity i LH vs ARCHITECT LH	Serum	mIU/mL (IU/L)	151	1.00	0.12	0.94	0.31-238.53

BIBLIOGRAPHY

1. Pierce JG, Parsons TF. Glycoprotein hormones: structure and function. *Annu Rev Biochem* 1981;50:465-495.
2. Shome B, Parlow AF. Human follicle stimulating hormone (hFSH): first proposal for the amino acid sequence of the α-subunit (hFSHα) and first demonstration of its α-subunit identity with an α-subunit of human luteinizing hormone (hLHα). *J Clin Endocrinol Metab* 1974;39(1):199-202.

3. Sairam MR, Li CH. Human pituitary thyrotropin: isolation and chemical characterization of its subunits. *Biochem Biophys Res Commun* 1973;51(2):336-342.
4. Vaitukaitis JL, Ross GT, Braunstein GD, et al. Gonadotropins and their subunits: basic and clinical studies. *Recent Prog Horm Res* 1976;32:289-331.
5. Bishop WH, Nureddin A, Ryan RJ. Pituitary luteinizing and follicle stimulating hormones. In: Parsons JA, editor. *Peptide Hormones.* Baltimore: University Park Press; 1976;273-298.
6. Keutmann HT, Williams RM, Ryan RJ. Structure of human luteinizing hormone beta subunit: evidence for a related carboxyl-terminal sequence among certain peptide hormones. *Biochem Biophys Res Commun* 1979;90(3):842-848.
7. Daughaday WH. The adenohypophysis. In: Wilson JD, Foster DW, editors. *Williams Textbook of Endocrinology.* Philadelphia: W.B. Saunders Co.; 1985:80-83.
8. Schally AV, Arimura A, Kastin AJ, et al. Gonadotropin-releasing hormone: one polypeptide regulates secretion of luteinizing and follicle-stimulating hormones. *Science* 1971;173(4001):1036-1038.
9. Harris GW, Naftolin F. The hypothalamus and control of ovulation. *Br Med Bull* 1970;26(1):3-9.
10. Knobil E. The neuroendocrine control of the menstrual cycle. *Recent Prog Horm Res* 1980;36:53-88.
11. Ross GT. Disorders of the ovary and female reproductive tract. In: Wilson JD, Foster DW, editors. *Williams Textbook of Endocrinology, 7th ed.* Philadelphia: WB Saunders Co.; 1985:206-258.
12. Vande Wiele RL, Bogumil J, Dyrenfurth I, et al. Mechanisms regulating the menstrual cycle in women. *Recent Prog Horm Res* 1970;26:63-103.
13. Bonnar J. Gynaecology and obstetrics: the hypothalamus and reproductive function. In: Scott RB, Walker RM, editors. *The Medical Annual* (England): J Wright and Sons; 1973:251-258.
14. Griffin JE, Wilson JD. Disorders of the testes and male reproductive tract. In: Wilson JD, Foster DW, editors. *Williams Textbook of Endocrinology.* 7th ed. Philadelphia: W.B. Saunders Co.; 1985:259-311.
15. Beastall GH, Ferguson KM, O'Reilly DS, et al. Assays for follicle stimulating hormone and luteinizing hormone: guidelines for the provision of a cinical biochemistry service. *Ann Clin Biochem* 1987;24(Pt 3):246-262.
16. Judd HL. Hormonal dynamics associated with the menopause. *Clin Obstet Gynecol* 1976;19(4):775-788.
17. Kletzky OA, Davajan V. Differential diagnosis of secondary amenorrhea. In: Mishell DR Jr, Brenner PF, editors. *Management of Common Problems in Obstetrics and Gynecology.* Oradell: Medical Economics Books; 1983:352-356.
18. Lachelin G. The polycystic ovary syndrome. In: Studd J, editor. *Progress in Obstetrics and Gynaecology.* Edinburgh: Churchill Livingstone; 1984:290-301.

19. Franchimont P. Human gonadotropin secretion in male subjects. In: James VHT, Serio M, Martini L, editors. *The Endocrine Function of the Human Testis.* New York: Academic Press; 1973:439-458.

20. Marshall JC. Clinics in endocrinology and metabolism. Investigative procedures. *Clin Endocrinol Metab* 1975;4(3):545-567.

21. US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, Bloodborne pathogens.

22. US Department of Health and Human Services. *Biosafety in Microbiological and Biomedical Laboratories*. 5th ed. Washington, DC: US Government Printing Office; December 2009.

23. World Health Organization. *Laboratory Biosafety Manual*. 3rd ed. Geneva: World Health Organization; 2004.

24. Clinical and Laboratory Standards Institute (CLSI). *Protection of Laboratory Workers From Occupationally Acquired Infections; Approved Guideline—Fourth Edition.* CLSI Document M29-A4. Wayne, PA: CLSI; 2014.

25. Clinical and Laboratory Standards Institute (CLSI). *Statistical Quality Control for Quantitative Measurement Procedures: Principles and Definitions; Approved Guideline—Third Edition.* CLSI Document C24-A3. Wayne, PA: CLSI; 2006.

26. Westgard JO. *Basic QC Practices.* 3rd ed. Madison, WI: Westgard Quality Corporation; 2010.

27. Primus FJ, Kelley EA, Hansen HJ, et al. "Sandwich"-type immunoassay of carcinoembryonic antigen in patients receiving murine monoclonal antibodies for diagnosis and therapy. *Clin Chem* 1988;34(2):261-264.

28. Schroff RW, Foon KA, Beatty SM, et al. Human anti-murine immunoglobulin responses in patients receiving monoclonal antibody therapy. *Cancer Res* 1985;45(2):879-885.

29. Boscato LM, Stuart MC. Heterophilic antibodies: a problem for all immunoassays. *Clin Chem* 1988;34(1):27-33.

30. Clinical and Laboratory Standards Institute (CLSI). *Evaluation of Precision Performance of Quantitative Measurement Methods; Approved Guideline—Second Edition.* CLSI Document EP05-A2. Wayne, PA: CLSI; 2004.

31. Clinical and Laboratory Standards Institute (CLSI). *Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures; Approved Guideline—Second Edition.* CLSI Document EP17-A2. Wayne, PA: CLSI; 2012.

32. Clinical and Laboratory Standards Institute (CLSI). *Evaluation of the Linearity of Quantitative Measurement Procedures: A Statistical Approach; Approved Guideline*. CLSI Document EP06-A. Wayne, PA: CLSI; 2003.

33. Clinical and Laboratory Standards Institute (CLSI). *Interference Testing in Clinical Chemistry; Approved Guideline—Second Edition.* CLSI Document EP07-A2. Wayne, PA: CLSI; 2005.

34. Clinical and Laboratory Standards Institute (CLSI). *Measurement Procedure Comparison and Bias Estimation Using Patient Samples; Approved Guideline—Third Edition.* CLSI Document EP09-A3. Wayne, PA: CLSI; 2013.