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510(k) SUMMARY

I. GENERAL INFORMATION

Trade or proprietary name - SeaLite Sciences, Inc. AquaLite® Prolactin

Common or usual name - Bioluminescent immunoassay (BIA)

Classification name - FDA has classified prolactin test systems intended for the measurement of prolactin in the diagnosis of hypothalamic and pituitary function as Class I devices. 21 C.F.R. §862.1625.

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**Legally Market Device to Which
Claim Substantial Equivalence:** Chiron Diagnostics ACS 180
Prolactin assay

II. INDICATIONS FOR USE

The AquaLite® Prolactin Bioluminescent Immunoassay (BIA) Kit (or the AquaLite® Prolactin assay) is intended to be used in clinical laboratories for the quantitative determination of human prolactin levels in sera and plasma. The AquaLite® Prolactin assay is for *in vitro* diagnostic use.

III. DEVICE DESCRIPTION

The AquaLite® Prolactin Bioluminescent Immunoassay Kit uses a mixture of mouse monoclonal and rabbit polyclonal with anti-prolactin activity that is pre-coated onto polystyrene tubes (solid phase). Samples (serum or plasma), or appropriate calibrators or controls, are pipetted (25 μ L) into the pre-coated tubes. Anti-prolactin conjugate consisting of mouse monoclonal antibody covalently linked to AquaLite® (150 μ L) is then added to the tubes. The conjugate uses the photoprotein, AquaLite® (recombinant aequorin; U.S. Patent Nos. 5,422,266 and 5,486,455) which is covalently linked to an anti-prolactin polyclonal antibody. Prolactin in the sample simultaneously combines with polyclonal antibody on the solid phase and conjugate antibody to form an immune complex or "sandwich" bound to the solid phase. Complex formation is complete after a 60-minute incubation period at room temperature (18° to 25°C) on a standard orbital shaker. The tubes are then washed to remove unbound conjugate.

The washed tubes are placed in a luminometer that is capable of reading a triggered, flash-type reaction in 12 x 75 mm tubes. An injected calcium trigger solution causes AquaLite® to oxidize its self-contained luciferin molecule. This reaction produces a two-second flash of light at 469 nm, which is measured by the luminometer. The intensity of the light is directly proportional to the concentration of the prolactin in the sample. To calculate results, the luminometer uses a cubic spline curve fit applied to a logit-log transformation of the light intensity (in relative light units, RLU) of the prolactin calibrators versus prolactin concentration (in ng/mL).

Note: Samples that generate signals greater than the signal from the highest calibrator are off-scale. These samples must be diluted and re-assayed. Remember to multiply the results from diluted samples by the dilution factor used.

IV. SUMMARY OF STUDIES AND TECHNOLOGICAL CHARACTERISTICS

Studies on SeaLite Sciences, Inc. AquaLite® Prolactin were conducted at SeaLite Sciences. The results are summarized below:

Performance Characteristics

1. Sensitivity

The sensitivity or detection limit of the AquaLite® Prolactin is 0.01 ng/mL. Sensitivity is determined by adding the mean signal of twenty (20) replicates of

the zero level calibrator plus two (2) standard deviations above this mean. The prolactin concentration (ng/mL) associated with this calculated signal is defined as the sensitivity of the assay.

2. Specificity

The AquaLite® Prolactin measures intact prolactin. The following human sialoglycoprotein hormones were supplied by the World Health Organization's National Institute for Biological Standards and Control (London, England). Aliquots of these preparations were diluted to the following levels in Calibrator A and assayed. Percent cross-reactivity (%) is reported below:

<u>Substance</u>	<u>WHO/NIBSC Lot Number</u>			<u>Tested Value</u>	<u>% Cross-reactivity</u>
LH	2 nd	I.S.	80/552	1000 ng/mL	<0.007
FSH	1 st	I.S.	83/575	1000 ng/mL	Not detectable
TSH	2 nd	IRP	80/558	1000 ng/mL	<0.001
hCG	3 rd	I.S.	75/537	1000 ng/mL	Not detectable
hPL	1 st	I.R.P.	73/545	12 µg/mL	0.38
hGH	1 st	I.S.	80/505	500 ng/mL	0.52

3. High Dose Hook Effect

No high dose hook effect occurs prior to 1,000 ng/mL prolactin.

4. Precision

(a) **Intra-assay precision.** Tri-level commercial controls containing prolactin at the following concentrations were assayed to determine intra-assay precision. (Total N = 20 per concentration level.)

<u>Prolactin Level (ng/ml)</u>	<u>% CV</u>
13.6	7.3%
29.1	7.2%
68.7	8.9%

- (b) **Inter-assay precision.** Tri-level commercial controls containing prolactin at the following concentrations were assayed in duplicate repetitively. Ten assays were performed using ten sets of calibration values. The inter-assay precision observed for the solutions (Total n = 2 x 10 = 20) are shown below.

<u>Prolactin Level</u> <u>(ng/ml)</u>	<u>% CV</u>
12.8	8.17%
28.1	8.96%
67.8	9.76%

5. Method Comparison

The AquaLite® Prolactin was used to assay patient samples (N=100) that were previously assayed by a commercially available automated chemiluminescent immunoassay. A slope of 0.8665 with a y-intercept of -1.9869 was obtained. The correlation coefficient was 0.9669.

6. Linearity and Nonparallelism

Three human serum samples containing the levels of endogenous prolactin shown below were diluted in parallel as indicated using Calibrator A (0 ng/mL) and assayed in duplicate using AquaLite® Prolactin. All concentrations are in ng/mL.

Sample ID	Dilution Factor	Found (ng/mL)	Expected (ng/mL)	Recovery (%)
#22	Undiluted	93.8	--	--
	1:2	47.09	46.90	100%
	1:4	29.05	23.45	124%
	1:8	13.44	11.73	115%
#51	Undiluted	109.38	--	--
	1:2	54.38	54.69	99%
	1:4	30.45	27.35	111%
	1:8	14.41	13.67	105%
#96	Undiluted	97.53	--	--
	1:2	43.78	48.77	90%
	1:4	26.66	24.38	109%
	1:8	10.29	12.19	84%

7. Spike and Recovery

Five normal male human serum samples were spiked to 25.7ng/mL prolactin using WHO prolactin (3rd I.S. 84/500). The spiked samples were assayed using the AquaLite® Prolactin. All values are in ng/mL.

<u>Sample ID</u>	<u>Prolactin ng/mL</u>	<u>Prolactin Observed</u>	<u>Prolactin Expected</u>	<u>Percent Recovered</u>
1	13.4	36.8	39.1	94%
2	7.63	34.5	33.3	104%
3	17.7	39.7	43.4	91.5%
4	21.9	45.0	47.6	94.5%
5	12.5	35.9	38.8	92.5%

8. Recovery in Serum and Plasma

Blood samples from 4 normal subjects were prepared as sera (standard technique and SST tubes) as well as heparin, EDTA, citrate and oxalate plasmas. Prolactin was quantified using the AquaLite® Prolactin. Recovered prolactin was compared with the prolactin recovered in serum (standard technique). The data demonstrate that there are no significant differences among serum and SST serum nor serum and heparin, EDTA, and citrate plasmas when using the AquaLite® Prolactin. Oxalate plasma is not recommended.

Sample	Serum	SST	%	Hep	%	EDTA	%	Citrate	%	Oxalate	%
A	19.4	21.4	110	18.6	96	19.9	103	18.3	94	16.0	82
B	11.7	12.1	103	11.3	97	10.7	91	10.7	91	9.93	85
C	15.0	15.5	103	17.4	116	13.2	88	13.4	89	14.5	97
D	12.1	11.8	98	12.1	100	11.1	92	10.3	85	10.3	85

V. ALTERNATIVE PRACTICES AND PROCEDURES

There are several assay technologies commonly employed to measure the presence of human prolactin in serum. They include: radioimmunoassay (RIA) and enzyme-linked immunosorbent immunoassay (ELISA).

VI. POTENTIAL ADVERSE EFFECTS OF THE DEVICE ON HEALTH

Use Universal Precautions. No known test method can offer complete assurance that products derived from human serum are pathogen-free; therefore, handle all materials of human origin as though they were potentially infectious.

Sodium azide is used as a preservative. This preservative may react with metallic plumbing to form explosive metal azides. Flush with large volumes of water when disposing of materials containing sodium azide.

As an *in vitro* diagnostic test, there are not direct adverse effects on the health of a patient from the use of this product. However, failure of the device to perform as indicated, the contamination of reagents, the use of reagents past the labeled expiration dates, the use of improper specimens, or human error during the performance of the test may lead to erroneous results and possible improper patient management.