

## SeraQuest® ANTI-SSB

REF

219192 96-Test Set

IVD

Intended Use: For the qualitative and semi-quantitative detection of human IgG antibodies to SSB in human serum by enzyme immunoassay, to aid in the diagnosis of systemic rheumatic disease, particularly Sjogren's Syndrome. This assay has not been cleared / approved by the FDA for blood / plasma donor screening.

For in vitro diagnostic use only.

### Summary of Test

Prepare 1:51 dilutions of Calibrator(s), Controls and samples in the SQ-Diluent. Mix well.  
Place 100 µl of the dilutions in the SQ-SSB IgG Wells; reserve one well for the reagent blank.  
Incubate at room temperature for 30 ± 5 minutes.  
Drain wells thoroughly. Wash wells 4 times with diluted SQ-Wash solution and drain.  
Place 100 µl of SQ-SSB IgG Conjugate in wells.  
Incubate at room temperature for 30 ± 5 minutes.  
Drain wells thoroughly. Wash wells 4 times with diluted SQ-Wash solution and drain.  
Place 100 µl of SQ-Substrate in wells.  
Incubate at room temperature for 30 ± 5 minutes.  
Stop the enzyme reaction with 100 µl of SQ-Stop.  
Read absorbance at 405 nm against reagent blank.

### Summary and Explanation of Test

The presence of one or more circulating autoantibodies to intracellular antigens is characteristic of the systemic rheumatic diseases. As the understanding of the nature of these antigens has grown, it has become increasingly clear that these diseases are distinguished by the presence of different sets of antibodies, giving each of the systemic rheumatic diseases a characteristic autoantibody profile. Therefore, the detection and identification of the circulating autoantibodies is helpful in the differential diagnosis of: systemic lupus erythematosus (SLE), polymyositis, Sjogren's syndrome, scleroderma, mixed connective tissue disease (MCTD), and drug-induced autoimmunity (1-3). Autoantibodies to SSB (La) are frequently associated with Sjogren's syndrome (40%), and to a lesser degree with SLE (15%) (1). Anti-SSB autoantibodies often occur with anti-SSA, and nearly all patients demonstrating the presence of Anti-SSB, will also be positive for anti-SSA (2).

The SeraQuest® ANTI-SSB test is an ELISA which utilizes a microwell format. Test results are obtained after one and one-half hours incubation time. They are objective and normalized as Index values which are traceable to an in-house anti-SSB standard.

### Principle of the Test

Diluted samples are incubated in antigen-coated wells. SSB antibodies (if present) are immobilized in the wells. Residual sample is eliminated by washing and draining, and conjugate (enzyme labeled antibodies to human IgG) is added and incubated. If IgG antibodies to SSB are present, the conjugate will be immobilized in the wells. Residual conjugate is eliminated by washing and draining, and the substrate is added and incubated. In the presence of the enzyme, the substrate is converted to a yellow end product which is read photometrically.

### Reagents

SQ-SSB IgG Wells	Coated with calf thymus SSB antigen. 12 eight-well strips.
SQ-Well Support	One
SQ-Diluent*	25 ml (pink color). Diluent for specimens. Contains a protein stabilizer.
SQ-SSB IgG Calibrator 1*	0.3 ml. Human serum. Strongly reactive for SSB IgG antibodies. Index value shown on vial label.
SQ-SSB IgG Calibrator 2*	0.3 ml. Human serum. Moderately reactive for SSB IgG antibodies. Index value shown on vial label.
SQ-SSB IgG Positive Control*	0.3 ml. Human serum. Reactive for SSB IgG antibodies. Index value range shown on vial label.
SQ-SSB IgG Negative Control*	0.3 ml. Human serum. Non-reactive for SSB IgG antibodies.
SQ-SSB IgG Conjugate*	12 ml (green color). Goat anti-human IgG labeled with Alkaline phosphatase (calf).
SQ-Substrate	12 ml. Substrate solution. <i>p</i> -nitrophenyl phosphate.

*Note: The substrate may develop a slight yellow color during storage. One hundred microliters of substrate should yield an absorbance value less than 0.35, when read in a microwell against air or water.*

SQ-Wash (30x)*	30 ml. Wash Solution (30x). Prepare Wash Solution by adding the contents of the SQ-Wash (30x) bottle to 1 liter of distilled or deionized water.
SQ-Stop	12 ml. Stop solution. Trisodium phosphate 0,5 M.

\* Contains sodium azide.

Store these reagents according to the instructions on the bottle labels. Do not allow them to contact the skin or eyes. If contact occurs, wash with copious amounts of water.

### Other Materials Required

1. Wash bottle
2. Pipettors for dispensing 4, 100 and 200 µl
3. Timer
4. 1 or 2 liter container for Wash Solution



5. Distilled or deionized water
6. Dilution tubes or microwells
7. Microwell reader capable of reading absorbance at 405 nm

### Precautions

1. For in vitro diagnostic use.
2. Test samples, Calibrator(s), Controls and the materials that contact them, should be handled as potential biohazards. The calibrators and controls have been found to be negative for HIV, hepatitis B surface antigen and HCV antibodies by licensed tests. However, because no method can offer complete assurance that HIV, hepatitis B virus, HCV or other infectious agents are absent, these materials should be handled at the Biosafety Level 2 as recommended for any potentially infectious serum or blood specimen in the Centers for Disease Control/National Institutes of Health Manual "Biosafety in Microbiological and Biomedical Laboratories", 1993, or latest edition.
3. Avoid contact with open skin.
4. Never pipet by mouth.
5. Certain of the test reagents contain sodium azide. Azides are reported to react with lead and copper in plumbing to form compounds that may detonate on percussion. When disposing of solutions containing sodium azide, flush drains with large volumes of water to minimize the build-up of metal-azide compounds.  
R 20/21/22: Harmful by inhalation, in contact with skin and if swallowed.  
S36/37: Wear suitable protective clothing and gloves.
6. Do not interchange reagents from different reagent lots, except for SQ-Wash, SQ-Substrate and SQ-Stop.
7. Do not use reagents beyond their stated expiration date.
8. Incubation times recommended in the Test Procedure section should be adhered to.
9. Unused SQ-SSB IgG Wells should be kept in their resealable bag with desiccant, and stored in the refrigerator.
10. This product should be used by qualified personnel.

### Specimen Collection

Sera should be separated from clotted blood. If specimens are not tested within 8 hours, they should be stored at 2 to 8°C for up to 48 hours. Beyond 48 hours specimens should be stored at -20°C or below. Multiple freeze-thaw cycles should be avoided. Samples containing visible particulate matter should be clarified by centrifugation; and hemolyzed, icteric or grossly contaminated samples should not be used. Samples should not be heat-inactivated before testing.

### Test Procedure

Allow all reagents and patient samples to reach room temperature before use. Return them promptly to refrigerator after use. The test procedure follows:

1. Prepare 1:51 dilutions of test samples, Calibrator(s), Positive and Negative Controls, in the SQ-Diluent. For example: add 4 µl of sample to 200 µl of SQ-Diluent in a dilution well or tube, and mix well.  
Note: For qualitative assays, a single Calibrator (SQ-SSB IgG Calibrator 2) may be used; for semi-quantitative and quantitative assays, use SQ-SSB IgG Calibrator 1 and SQ-SSB IgG Calibrator 2.
2. Place an appropriate number of coated wells from SQ-SSB IgG Wells in the Well Support.
3. Transfer 100 µl of each diluted Calibrator, Control and patient sample to the wells.  
Note: Include one well which contains 100 µl of SQ-Diluent only. This will serve as the reagent blank and will be ultimately used to zero the photometer before reading the test results.
4. Incubate the wells at room temperature (20 to 25°C) for 30 ± 5 minutes.
5. Wash wells four times with diluted SQ-Wash solution, drain thoroughly.
6. Place 100 µl of SQ-SSB IgG Conjugate into each well.
7. Incubate the wells at room temperature for 30 ± 5 minutes.
8. Wash the wells four times with diluted SQ-Wash solution, drain thoroughly.
9. Place 100 µl of SQ-Substrate into each well.
10. Incubate at room temperature for 30 ± 5 minutes.
11. Place 100 µl of SQ-Stop into each well.
12. Read and record the absorbance of the contents of each well at 405 nm against the reagent blank.  
Note: Adjust the photometer to zero absorbance at 405 nm against the reagent blank. Readings should be made within 2 hours after the reactions have been stopped.

### Calculation of Results

Qualitative results may be calculated using a single calibrator. For semi-quantitative results, use a calibration curve consisting of two or more calibrators.

#### Single Calibrator (SQ-SSB IgG Calibrator 2)

Determine the Index value for each test sample (or Control) using the following formula:

$$\frac{\text{SQ-SSB IgG Calibrator 2 Index}}{\text{SQ-SSB IgG Calibrator 2 Absorbance}} \times \text{Test Sample Absorbance} = \text{Test sample Index}$$

If the Calibrator is run in duplicate, use the average absorbance value to calculate results.

#### Calibration Curve

Alternatively, test results may be calculated from a three-point curve comprised of: SQ-SSB IgG Calibrator 1 (high-point), SQ-SSB IgG Calibrator 2 (mid-point) and the reagent blank (zero / origin), using a point-to-point curve fit.

The upper range of the curve may be expanded by adding additional points. For example: the concentration of Calibrator 1 may be increased 1.5-fold, and 2-fold, by adding 6 µl and 8 µl of SQ-SSB IgG Calibrator 1 to 200 µl of the SQ-Diluent, and transferring 100 µl of each dilution to coated wells. The



Index values, assigned to these points, should be 1.5 and 2 times respectively, the value shown on the SQ-SSB IgG Calibrator 1 label. The extent, to which the upper range of the standard curve may be expanded, will be limited by the calibrator(s) being used.

### Quality Control

1. The Calibrator(s), SQ-SSB IgG Positive Control and SQ-SSB IgG Negative Control must be included in each test run.
2. The absorbance values of SQ-SSB IgG Calibrator 1 must be at least 0.4, when read against the reagent blank.
3. The absorbance value of the reagent blank should be less than 0.35.
4. The SQ-SSB IgG Negative Control must have an Index value less than 0.9. This control is used to validate the assay below the cutoff of the assay.
5. The SQ-SSB IgG Positive Control must have an Index value within the ranges printed on the label. When performing qualitative tests, users may supply alternative positive controls if they wish.
6. To validate the upper range of the assay when performing the semi-quantitative and quantitative procedures, the SQ-SSB IgG Positive Control should be run at higher concentrations. For example, the Positive Control should be assayed at 1.5-fold and 2-fold concentrations by adding 6  $\mu$ l and 8  $\mu$ l of the SQ-SSB IgG Positive Control, to 200  $\mu$ l aliquots of the test set SQ-Diluent, and transferring 100  $\mu$ l of each of these dilutions to coated wells. The expected value ranges for these concentrated controls would be 1.5 times and 2 times respectively, the expected value ranges printed on the SQ-SSB IgG Positive Control label. If the control values do not fall within the specified ranges, the assay is invalid and should be repeated. Optionally, users may supply alternative positive controls if they wish.
7. The SQ-SSB IgG Negative Control and SQ-SSB IgG Positive Control are intended to monitor for substantial reagent failure. The SQ-SSB IgG Positive Control will not ensure precision at the assay cutoff. Users may wish to establish an in-house control, having a quantitative value determined by replicate testing, at or near the cutoff of the assay, to monitor the precision of the assay cutoff. Additional controls may be tested according to guidelines or requirements of local, state and/or federal regulations or accrediting organizations. For guidance on appropriate quality control practices, please refer to NCCLS document C24-A, Internal Quality Control Testing: Principles and Definitions. If any of these criteria are not met, the test is invalid and should be repeated.

### Interpretation of Results

Index Value	Interpretation
<0.9	Negative for SSB IgG antibody.
$\geq 0.9$ to < 1.1	Equivocal
$\geq 1.1$	Positive for SSB IgG antibody.

Specimens which yield absorbance values above the range of the test set calibrator(s) may be reported as greater than the Index value of the uppermost point of the calibration curve. Alternatively, such specimens may be pre-diluted in the SQ-Diluent and reassayed. The resulting Index value must be multiplied by the dilution factor for reporting. *Example: If the specimen has been pre-diluted 1:5 before testing, the resulting Index value should be multiplied by 5.*

Differences in the antibody anti-SSB levels which are greater than the imprecision of the assay, i.e. > 20% (Mean intra-assay CV + 3 SD, see Tables 5, 6, 7 and 8) are considered significant.

The suggested method for reporting results is: The following results were obtained with the SeraQuest® ANTI-SSB test. Values obtained with different manufacturer's assay methods may not be used interchangeably. The magnitude of the reported IgG level cannot be correlated to an endpoint titer. When the assay is used qualitatively, the magnitude of results above the cut-off is not an indicator of total antibody present.

### Limitations

The results obtained with the SeraQuest® ANTI-SSB test serve only as an aid to diagnosis and should not be interpreted as diagnostic in themselves. A positive result is suggestive and should be confirmed by other clinical findings.

Some individuals may have high levels of SSB antibodies, with no evidence of clinical disease. In contrast, some individuals with clinical disease may not exhibit detectable levels of anti-SSB.

This assays performance characteristics of SeraQuest® ANTI-SSB have not been established for testing matrices other than human serum.

Titration experiments (please see Figure 1) have shown that the upper limit of linearity for SeraQuest® ANTI-SSB IgG index values is approximately 4.

### Expected Values

The normal range of the SeraQuest® ANTI-SSB test was determined with serum specimens obtained from 259 specimens which gave negative results in another commercial EIA test. The mean Index value was 0.13 and the standard deviation was 0.27. Based on these results, the positive Index cutoff value was set at 1.1.

364 serum samples obtained randomly from 276 patients with clinically diagnosed disease, including systemic rheumatic disease and 88 normal donors were assayed by the SeraQuest® ANTI-SSB test. The incidence of these values is shown in Table 1.

Table 1. Results of tests of 276 serum from patients with clinically diagnosed disease, including systemic rheumatic disease, and from 88 normal blood donors, performed at SeraQuest® (Lab B, Miami, FL), using the SeraQuest® ANTI-SSB test.

Donor Group	n	Ranges : Index Values			
		Index	< 1.1	$\geq 1.1$ < 10	$\geq 10$ < 15
Asymptomatic Normal	88	88 (100%)	0	0	0
Systemic Lupus Erythematosus	171	123 (72%)	34 (19%)	13 (8%)	0
SLE/Sec. Sjogren's Syndrome	13	5 (38%)	6 (46%)	2 (16%)	0
Subacute Lupus	5	2 (40%)	3 (60%)	0	0
Sjogren's Syndrome	31	29 (94%)	2 (6%)	0	0
MCTD	8	3 (38%)	4 (50%)	1 (12%)	0
MCTD/Sec. Sjogren's Syndrome	5	1 (20%)	3 (60%)	1 (20%)	0
UCTD	2	1 (50%)	1 (50%)	0	0



Crest	2	2 (100%)	0	0	0
Raynaud's Phenomenon	2	2 (100%)	0	0	0
Rheumatoid Arthritis (RA)	16	16 (100%)	0	0	0
RA/Sec. Sjogren's Syndrome	5	5 (100%)	0	0	0
Osteoarthritis	2	2 (100%)	0	0	0
Hepatitis	2	2 (100%)	0	0	0
Neoplasia	1	1 (100%)	0	0	0
Thrombopenia	1	1 (100%)	0	0	0
Vasculitis	3	3 (100%)	0	0	0
Leukemia	4	3 (75%)	1 (25%)	0	0
Multiple Sclerosis	1	1 (100%)	0	0	0
Hypertension	2	2 (100%)	0	0	0

n= total specimens in donor group; (%) = percentage of the donor group, Sec = secondary; MCTD = mixed connective tissue disease and UCTD = undifferentiated connective tissue disease.

**Performance Characteristics**

**Comparative Testing**

The results of SeraQuest® ANTI-SSB IgG tests correlate well with other commercial serological tests. Sera from clinically diagnosed patients, as well as from serum normal donors, were assayed for the presence of anti-SSB IgG antibodies, using the SeraQuest® ANTI-SSB test, and another commercial EIA test. The assays were performed at two independent laboratory (Lab A, Barcelona, Spain and Lab B, Madrid, Spain), and at SeraQuest® (Lab C, Miami, FL). The results obtained in these studies are shown below in Tables 2, 3 and 4, respectively.

**Table 2. Results of tests of 89 specimens from clinically diagnosed patients and normal donors (100 % frozen), performed at Laboratory A (Barcelona, Spain), using the SeraQuest® ANTI-SSB test and another commercial EIA test.**

Comparative SeraQuest® ANTI-SSB test						
Test 1	Positive	Equivocal	Negative		%	95% CI**
Positive	17	1	1	Relative sensitivity	94.4	83.9 to 100 %
Negative	3	0	67	Relative specificity*	95.7	91.0 to 100 %
				Overall Agreement*	91.1	91.1 to 99.8 %

\* Excluding equivocal results

\*\* Calculated by the Normal Method (4).

**Table 3. Results of tests of 120 specimens from clinically diagnosed patients and normal donors (100% frozen), performed at at Laboratory B (Madrid, Spain), using the SeraQuest® ANTI-SSB test and another commercial EIA test.**

Comparative SeraQuest® ANTI-SSB test						
Test 1	Positive	Equivocal	Negative		%	95% CI**
Positive	28	5	9	Relative sensitivity	75.6	61.9 to 89.5 %
Negative	0	0	78	Relative specificity*	100	99.1 to 100 %
				Overall Agreement*	92.1	87.3 to 97.1 %

\* Excluding equivocal results

\*\* Calculated by the Normal Method (4).

**Table 4. Results of tests of 288 specimens from clinically diagnosed patients, normal donors and serum brokers (100% frozen), performed at SeraQuest® (Lab C, Miami, FL), using the SeraQuest® ANTI-SSB test and another commercial EIA test.**

Comparative SeraQuest® ANTI-SSB test						
Test 1	Positive	Equivocal	Negative		%	95% CI**
Positive	27	0	1	Relative sensitivity	96.4	89.6 to 100 %
Negative	7	1	252	Relative specificity*	97.2	95.3 to 99.3 %
				Overall Agreement*	99.6	95.3 to 99.1 %

\* Excluding equivocal results

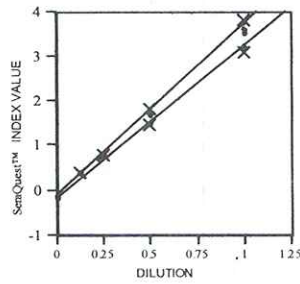
\*\* Calculated by the Normal Method (4).

Please be advised that "relative" refers to the comparison of this assay's results to that of a similar assay. There was not an attempt to correlate the assay's results to disease presence or absence. No judgment can be made on the comparison assay's accuracy to predict disease.

**Titration curve**

Several strongly positive serum specimens were serially diluted (two-fold) in triplicate, and assayed by the SeraQuest® ANTI-SSB test. Typical results are shown in Figure 1.

**Figure 1. Titration curve for a strongly positive specimen.**



The triplicate data for each dilution are shown as points, the 95 % confidence limits for each set of triplicate data are indicated by (x's), and the 95 % confidence limits for the slopes and y-intercepts are represented by straight lines. The formula for the linear regression for the triplicate data is shown in Figure 1.

**Specificity**

The SeraQuest® ANTI-SSB test is specific for IgG antibodies directed against SSB, and does not cross-react with other nuclear antigens. Of 72 specimens which were unreactive in the SeraQuest® ANTI-SSB test, 41 were shown positive for IgG antibody directed against dsDNA antigen, 40 against Sm/RNP complex, 31 against SSA antigen and 13 against Sm.

**Precision**

Eight serum specimens (2 negative and 6 positive) and the SQ-SSB IgG Positive Control and SQ-SSB IgG Negative Control, were assayed in triplicate, on three separate occasions. The precision experiments were performed manually at a two independent laboratory (Lab A and Lab B), and at SeraQuest® (Lab C). These results are shown below in Tables 5, 6, 7 and 8, respectively.

**Table 5. Results Intra-assay and Inter-assay precision tests performed at Laboratory A. Values were calculated from SeraQuest® Index value.**

Sample	INTRA-ASSAY			INTER-ASSAY		
	Mean (Index)	S.D.	CV%	Mean (Index)	S.D.	CV%
Post. Contr.	1.3	0.000	0.0	1.6	0.271	16.8
Neg. Contr.	0.1	0.058	NA	0.2	0.109	NA
1	0.1	0.000	NA	0.1	0.000	NA
2	0.1	0.058	NA	0.2	0.000	NA
3	2.4	0.231	9.5	2.4	0.220	9.2
4	1.1	0.058	5.1	1.2	0.093	7.7
5	2.0	0.058	2.8	2.2	0.240	10.7
6	1.7	0.115	6.9	1.7	0.174	10.0
7	1.7	0.153	8.8	1.9	0.159	8.6
8	1.1	0.100	9.1	1.1	0.117	10.5

NA: Not applied

**Table 6. Results Intra-assay and Inter-assay precision tests performed at Laboratory B. Values were calculated from SeraQuest® Index value.**

Sample	INTRA-ASSAY			INTER-ASSAY		
	Mean (Index)	S.D.	CV%	Mean (Index)	S.D.	CV%
Post. Contr.	1.3	0.000	0.0	1.4	0.105	7.5
Neg. Contr.	0.1	0.000	NA	0.1	0.033	NA
1	0.2	0.115	NA	0.1	0.000	NA
2	0.1	0.000	NA	0.1	0.000	NA
3	2.1	0.000	0.0	2.1	0.050	2.4
4	1.1	0.000	0.0	1.1	0.073	6.9
5	1.8	0.000	0.0	1.8	0.067	3.7
6	1.7	0.058	3.3	1.7	0.050	2.9
7	1.7	0.000	0.0	1.7	0.050	3.0
8	1.0	0.000	0.0	1.0	0.033	3.3

NA: Not applied

**Table 7. Results Intra-assay and Inter-assay precision tests performed at Laboratory C. Values were calculated from SeraQuest® Index value.**

Sample	INTRA-ASSAY			INTER-ASSAY		
	Mean (Index)	S.D.	CV%	Mean (Index)	S.D.	CV%



Post. Contr.	1.9	0.058	3.0	2.7	0.053	2.7
Neg. Contr.	0.1	0.000	NA	0.1	0.033	NA
1	0.0	0.058	NA	0.0	0.000	NA
2	0.1	0.058	NA	0.1	0.000	NA
3	2.6	0.173	6.7	2.8	0.224	8.0
4	1.3	0.115	8.7	1.5	0.124	8.5
5	2.6	0.252	9.8	2.3	0.239	10.3
6	2.3	0.058	2.5	2.0	0.274	13.5
7	2.0	0.100	5.0	2.0	0.101	5.2
8	1.5	0.058	3.9	1.5	0.124	8.0

NA: Not applied

Table 8. Interlaboratory Precision. Tests were performed manually at Laboratory A, B and C. Values were calculated from the SeraQuest® Index values.

Sample	Index		
	Mean	S.D.	CV%
Post. Contr.	1.7	0.143	8.6
Neg. Contr.	0.1	0.047	NA
1	0.1	0.011	NA
2	0.1	0.017	NA
3	2.4	0.165	6.8
4	1.3	0.097	7.6
5	2.1	0.182	8.7
6	1.8	0.166	9.2
7	1.9	0.103	5.5
8	1.2	0.090	7.5

NA: Not applied

**References**

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4. Gardner, M. J. and Altman, D.G. Confidence Intervals Rather than Hypotesis Testing. Brit. Med. J., 292: 746-750 (1986)



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96 Tests



Catalog No.



In vitro diagnostic Use only



Temperature Limitations

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