

*Please use only the valid version of the package insert provided with the kit.*

## NAME AND INTENDED USE

Anti-SS-A is an indirect solid phase enzyme immunoassay (ELISA) for the quantitative measurement of IgG class autoantibodies against SS-A (Ro, 52 and 60 kDa) in human serum or plasma.

The assay is intended for in vitro use only as an aid in the determination of Systemic Lupus erythematosus and Sjogren's Syndrome (SS).

## SUMMARY AND EXPLANATION OF THE TEST

Rheumatoid autoimmune diseases are often associated with the occurrence of autoantibodies against several nuclear or cytoplasmic antigens.

In patients with Sjögren-Syndrome antibodies against SS-A and SS-B often occur in combination. The anti SS-A protein passes the placenta and may cause the development of SLE in neonates.

Each class of immunoglobulins causes a specific immunofluorescent pattern. Basically immunofluorescence titers correlate with the quantitation of IgG antibodies but the concentrations may vary considerably within each titer.

Quantitation of IgG class antibodies extensively correlates with the diseases' activity. This makes it superior to immunofluorescence using Hep2 cells. The IF with Crithidia lucilliae sometimes results in deviating values.

Today the best investigated immunoreactive antigens are double-stranded DNA (dsDNA), single stranded DNA (ssDNA), Sm (Smith), sn-RNP (small nuclear ribonucleoprotein particles), the complex RNP/Sm which is stabilized by ribonucleic acid as well as SS-A (Ro) and SS-B (La). The antigen Scl 70, a 70 kD molecular weight protein is associated with scleroderma.

In rheumatoid autoimmune diseases various profiles of autoantibodies to these antigens can be detected. In a high incidence they are related to active and inactive systemic Lupus erythematosus, mixed connective tissue diseases (Sharp Syndrome), rheumatoid arthritis, Sjögren-Syndrome, Scleroderma, photosensitive dermatitis and drug-induced lupus.

In Lupus patients typically anti-dsDNA antibodies can be detected. Patients without these antibodies very often show anti-ssDNA antibodies and anti-SS-A and anti-SS-B are present. A strong correlation between antibody concentration and severity of the disease has been observed with higher antibody concentrations in active phases of the disease. Thus quantitation is more informative compared to simple titrating by immunofluorescence.

Most of these parameters are not specific for just one disease but they occur in various combinations. The pattern of different antibody combinations and their concentration together with the whole clinical picture of the patient are helpful diagnostic tools in the assessment of rheumatoid autoimmune diseases.

The following graph gives brief information on the complexity of autoimmune diseases, occurring antibodies. It is not designed as a diagnostic schedule or program for ongoing diagnostic profiles.

Diseases (values in %)	Anti-								
	dsDNA	ssDNA	Histon	SS-A (Ro)	SS-B (La)	Sm	RNP/Sm	Scl 70	Jo-1
Systemic Lupus erythematodes (SLE)	> 90	> 90	30-50	10-30	30-50	10-30	10-30		
Drug induced Lupus (LE)		30-50	50-90						
Sharp-Syndrome / Mixed connective tissue diseases	10-30	10-30					> 90		
Rheumatoid Arthritis		30-50	30-50	10-30					
Sjögren's syndrome	10-30	10-30		> 90	> 90				
Scleroderma	10-30	10-30		10-30				> 90	
Photosensitive Dermatitis Dermatomyositis	10-30	10-30							50-90

## PRINCIPLE OF THE TEST

Highly purified SS-A is bound to microwells. Antibodies against this antigen, if present in diluted serum or plasma, bind to the respective antigen. Washing of the microwells removes unspecific serum and plasma components. Horseradish peroxidase (HRP) conjugated antihuman IgG immunologically detects the bound patient antibodies forming a conjugate/antibody/antigen complex. Washing of the microwells removes unbound conjugate. An enzyme substrate in the presence of bound conjugate hydrolyzes to form a blue color. The addition of an acid stops the reaction forming a yellow end-product. The intensity of this yellow color is measured photometrically at 450 nm. The amount of colour is directly proportional to the concentration of IgG antibodies present in the original sample.

## WARNINGS AND PRECAUTIONS

1. All reagents of this kit are strictly intended for in vitro use only.
2. Do not interchange kit components from different lots.
3. Components containing human serum were tested and found negative for HBsAg, HCV, HIV1 and HIV2 by FDA approved methods. No test can guarantee the absence of HBsAg, HCV, HIV1 and HIV2, and so all human serum based reagents in this kit must be handled as though capable of transmitting infection.
4. Avoid contact with the TMB (3,3',5,5'-Tetramethyl-benzidine). If TMB comes into contact with skin, wash thoroughly with water and soap.
5. Avoid contact with the Stop Solution which is acid. If it comes into contact with skin, wash thoroughly with water and seek medical attention.

6. Some kit components (i.e. Controls, Sample buffer and Buffered Wash Solution) contain Sodium Azide as preservative. Sodium Azide ( $\text{NaN}_3$ ) is highly toxic and reactive in pure form. At the product concentrations (0,09%), though not hazardous. Despite the classification as non-hazardous, we strongly recommend using prudent laboratory practices (see 8., 9., 10.).
7. Some kit components contain Proclin 300 as preservative. When disposing reagents containing Proclin 300, flush drains with copious amounts of water to dilute the components below active levels.
8. Wear disposable gloves while handling specimens or kit reagents and wash hands thoroughly afterwards.
9. Do not pipette by mouth.
10. Do not eat, drink, smoke or apply makeup in areas where specimens or kit reagents are handled.
11. Avoid contact between the buffered Peroxide Solution and easily oxidized materials; extreme temperature may initiate spontaneous combustion.

Observe the guidelines for performing quality control in medical laboratories by assaying controls and/or pooled sera. During handling of all kit reagents, controls and serum samples observe the existing legal regulations.

## CONTENTS OF THE KIT

Package size	96 determ.
Qty.1	Divisible <b>microplate</b> consisting of 12 modules of 8 wells each, coated with highly purified SS-A. Ready to use.
6 vials, 1.5 ml each	combined <b>Calibrators</b> with IgG class Anti-SS-A antibodies (A-F) in a serum/buffer matrix (PBS, BSA, $\text{NaN}_3$ <0,1% (w/w)) containing: IgG 0; 12.5; 25; 50; 100; and 200 U/ml.. Ready to use.
2 vials, 1.5 ml each	<b>Anti-SS-A Controls</b> in a serum/buffer matrix (PBS, BSA, $\text{NaN}_3$ <0.1% (w/w)) positive (1) and negative (2), for the respective concentrations see the enclosed QC insert. Ready to use.
1 vial, 20 ml	<b>Sample buffer</b> (Tris, $\text{NaN}_3$ <0.1% (w/w)), yellow, concentrate (5x).
1 vial, 15 ml	<b>Enzyme conjugate</b> solution (PBS, PROCLIN 300 <0.5% (v/v)), (light red) containing polyclonal rabbit anti-human IgG, labelled with horseradish peroxidase. Ready to use.
1 vial, 15 ml	<b>TMB substrate solution</b> . Ready to use.
1 vial, 15 ml	<b>Stop solution</b> (contains acid). Ready to use.
1 vial, 20 ml	<b>Wash solution</b> (PBS, $\text{NaN}_3$ <0.1% (w/w)), concentrate (50x).

## STORAGE AND STABILITY

1. Store the kit at 2-8 °C.
2. Keep microplate wells sealed in a dry bag with desiccants.
3. The reagents are stable until expiration of the kit.
4. Do not expose test reagents to heat, sun or strong light during storage and usage.

5. Diluted sample buffer and wash buffer are stable for at least 30 days when stored at 2-8 °C.

## **MATERIALS REQUIRED**

### **Equipment**

- Microplate reader capable of endpoint measurements at 450 nm
- Multi-Channel Dispenser or repeatable pipet for 100 µl
- Vortex mixer
- Pipets for 10 µl, 100 µl and 1000 µl
- Laboratory timing device
- Data reduction software

### **Preparation of reagents**

- Distilled or deionized water
- Graduated cylinder for 100 and 1000 ml
- Plastic container for storage of the wash solution

## **SPECIMEN COLLECTION, STORAGE AND HANDLING**

1. Collect whole blood specimens using acceptable medical techniques to avoid hemolysis.
2. Allow blood to clot and separate the serum by centrifugation.
3. Test serum should be clear and non-hemolyzed. Contamination by hemolysis or lipemia is best avoided, but does not interfere with this assay.
4. Specimens may be refrigerated at 2-8 °C for up to five days or stored at -20 °C up to six months.
5. Avoid repetitive freezing and thawing of serum samples. This may result in variable loss of autoantibody activity.
6. Testing of heat-inactivated sera is not recommended.

## **PROCEDURAL NOTES**

1. Do not use kit components beyond their expiration dates.
2. Do not interchange kit components from different lots.
3. All materials must be at room temperature (20-28 °C).
4. Have all reagents and samples ready before start of the assay. Once started, the test must be performed without interruption to get the most reliable and consistent results.
5. Perform the assay steps only in the order indicated.
6. Always use fresh sample dilutions.
7. Pipette all reagents and samples into the bottom of the wells.
8. To avoid carryover contamination change the tip between samples and different kit controls.
9. It is important to wash microwells thoroughly and remove the last droplets of wash buffer to achieve best results.
10. All incubation steps must be accurately timed.

11. Control sera or pools should routinely be assayed as unknowns to check performance of the reagents and the assay.
12. Do not re-use microplate wells.

For all controls, the respective concentrations are provided on the labels of each vial. Using these concentrations a calibration curve may be calculated to read off the patient results semi-quantitatively.

### **PREPARATION OF REAGENTS**

#### **Preparation of sample buffer**

Dilute the contents of each vial of the sample buffer concentrate (5x) with distilled or deionized water to a final volume of 100 ml prior to use.

Store refrigerated: stable at 2-8 °C for at least 30 days after preparation or until the expiration date printed on the label.

#### **Preparation of wash solution**

Dilute the contents of each vial of the buffered wash solution concentrate (50x) with distilled or deionized water to a final volume of 1000 ml prior to use.

Store refrigerated: stable at 2-8 °C for at least 30 days after preparation or until the expiration date printed on the label.

#### **Sample preparation**

Dilute all patient samples **1:100** with sample buffer before assay.

Therefore combine 10 µl of sample with 990 µl of sample buffer in a polystyrene tube. Mix well.

Controls are ready to use and need not be diluted.

### **TEST PROCEDURE**

1. Prepare a sufficient number of microplate modules to accommodate controls and prediluted patient samples.
2. Pipet **100 µl** of calibrators, controls and prediluted patient samples in duplicate into the wells.
3. Incubate for 30 minutes at room temperature (20-28 °C).
4. Discard the contents of the microwells and wash 3 times with **300 µl** of wash solution.
5. Dispense **100 µl** of enzyme conjugate into each well.
6. Incubate for 15 minutes at room temperature.
7. Discard the contents of the microwells and wash 3 times with **300 µl** of wash solution.
8. Dispense **100 µl** of TMB substrate solution into each well.
9. Incubate for 15 minutes at room temperature.
10. Add **100 µl** of stop solution to each well of the modules and incubate for 5 minutes at room temperature.
11. Read the optical density at 450 nm and calculate the results. Bi-chromatic measurement with a reference at 600-690 nm is recommended.

The developed colour is stable for at least 30 minutes. Read optical densities during this time.

**Automation**

The Anti-SS-A ELISA is suitable for use on open automated ELISA processors. The test procedure detailed above is appropriate for use with or without automation.

**INTERPRETATION OF RESULTS****Quality Control**

This test is only valid if the optical density at 450 nm for Positive Control (1) and Negative Control (2) as well as for the Calibrator A and F complies with the respective range indicated on the Quality Control Certificate enclosed to each test kit !

If any of these criteria is not fulfilled, the results are invalid and the test should be repeated.

**Calculation of results**

For Anti-SS-A a 4-Parameter-Fit with lin-log coordinates for optical density and concentration is the data reduction method of choice.

**Recommended Lin-Log Plot**

First calculate the averaged optical densities for each calibrator well. Use lin-log graph paper and plot the averaged optical density of each calibrator versus the concentration. Draw the best fitting curve approximating the path of all calibrator points. The calibrator points may also be connected with straight line segments. The concentration of unknowns may then be estimated from the calibration curve by interpolation.

**Calculation example**

The figures below show typical results for Anti-SS-A ELISA. These data are intended for illustration only and should not be used to calculate results from another run.

Calibrators									
No	Position	OD 1	OD 2	Mean	Conc. 1	Conc. 2	Mean	decl. Conc.	CV %
ST1	A 1/A 2	0.023	0.021	0.022	0.0	0.0	0.0	0,0	9
ST2	B 1/B 2	0.174	0.174	0.174	13	13	13	12	0
ST3	C 1/C 2	0.336	0.335	0.336	25	25	25	25	0
ST4	D 1/D 2	0.643	0.658	0.651	49	50	50	50	2
ST5	E 1/E 2	1.172	1.173	1.173	101	101	101	100	0
ST6	F 1/F 2	1.809	1.788	1.799	201	197	199	200	1

### Interpretation of results

In a normal range study with serum samples from healthy blood donors the following ranges have been established with the Anti-SS-A test:

	<u>Anti-SS-A [U/ml]</u>
normal:	< 15
borderline:	15 - 25
elevated:	> 25

Positive results should be verified concerning the entire clinical status of the patient. Also every decision for therapy should be taken individually. It is recommended that each laboratory establishes its own normal and pathological ranges of serum Anti-SS-A. The values above should be regarded as guidelines only.

### PERFORMANCE CHARACTERISTICS

#### Parallelism

In dilution experiments sera with high IgG-antibody concentrations were diluted with sample buffer and assayed in the Anti-SS-A kit.

Sample	Dilution	Observed [U/ml]	Expected [U/ml]	O/E
1	1:100	139.0		
	1:200	67.9	69.5	97 %
	1:400	33.0	34.8	95 %
	1:800	17.2	17.4	99 %
2	1:200	161.6		
	1:400	70.6	80.8	87 %
	1:800	39.2	40.4	97 %
	1:1600	20.0	20.2	99 %

#### Precision (Reproducibility)

Statistics for coefficients of variation (CV) were calculated for each of three samples from the results of 24 determinations in a single run for Intra-Assay precision. Run-to-run precision was calculated from the results of 5 different runs with 6 determinations of each sample:

Intra-Assay		
Sample	Mean	CV
No	[U/ml]	[%]
1	32.2	2.7
2	73.2	2.6
3	134.0	3.6

Intra-Assay		
Sample	Mean	CV
No	[U/ml]	[%]
1	33.8	6.4
2	71.3	6.2
3	133.1	1.1

**Sensitivity**

The lower detection limit for Anti-SS-A has been determined at 1.0 U/ml.

**Specificity**

The microplate is coated with SS-A highly purified by affinity chromatography. The Anti-SS-A test kit is specific only for autoantibodies directed to SS-A. No cross reactivities to the other ENA-antigens have been observed.

**Calibration**

The assay system is calibrated against the internationally recognized reference sera from CDC, Atlanta USA, since no other international standards are available.

**LIMITATIONS OF PROCEDURE**

The Anti-SS-A IgG ELISA is a diagnostic aid. A definite clinical diagnosis should not be based on the results of a single test, but should be made by the physician after all clinical and laboratory findings have been evaluated.

A negative Anti-SS-A result does not rule out the presence of SLE or SS.

**INTERFERING SUBSTANCES**











No interference has been observed with haemolytic (up to 1000 mg/dL), lipemic (up to 3 g/dL triglycerides) or bilirubin (up to 40 mg/dL) containing sera. Nor have any interfering effects been observed with the use of anticoagulants. However for practical reasons it is recommended that grossly hemolyzed or lipemic samples should be avoided.













**REFERENCES**

1. Antinuclear Antibodies The Lancet 1984; 15: 611 - 613.
2. Froelich, Ch. J., Wallmann, H., Skosey, J. L. and Teodorescu, M. Clinical Value of an Integrated ELISA System for the Detection of 6 Autoantibodies (ssDNA, dsDNA, Sm, RNP/Sm, SSA and SSB). The Journal of Rheumatology 1990; Vol 17, No 2: 192 - 200.
3. Harley, J. B. and Gaither, K.K. Autoantibodies. Rheumatic Disease Clinics of North America 1988; Vol 14, No 1: 43 - 56.
4. Slobbe, R.L. et al. Detection and occurrence of the 60- and 52-kD Ro (SS-A) antigens and of autoantibodies against these proteins. Clin. Exp. Immunol. 1991; 86: 99 - 105.
5. Hartung, K. and Deicher, H. Systemischer Lupus erythematoses. Allergologie 1985; Jahrgang 8, Nr. 7: 275 - 281.
6. Hartung, K. and Deicher, H. Symptome und Symptommuster beim systemischen Lupus erythematoses. Die Internistische Welt 1987; 9: 236 - 241.
7. Takeda, J. et al. Antigenic Domains on the U1 Small Nuclear Ribonucleoprotein-Associated 70K Polypeptide: A Comparison of Regions Selectively Recognized by Human and Mouse Autoantibodies and by Monoclonal Antibodies. Clinical Immunology and Immunopathology 1991; 61: 55 - 68.
8. Reichlin, M. and Van Venrooij, W. J. Autoantibodies to the URNP particles: relationship to clinical diagnosis and nephritis. Clin. exp. Immunol. 1991; 83: 286 - 290.
9. Hietarinta, M., Lassila, O. and Hietaharju, A. Association of Anti-U1RNP- and Anti-Scl-70-anti-bodies with Neurological Manifestations in Systemic Sclerosis (Scleroderma). Scand. J. Rheumatol. 1994; 23: 64 - 67.
10. Reveille, J.D. et al. Racial Differences in the Frequencies of Scleroderma-related Autoantibodies. Arthritis and Rheumatism 1992; Vol 35, No 2: 216 - 218.
11. Genth, E. and Mierau, R. Jo-1-(Antisynthetase-)Syndrom - verbessern Autoantikörper die Klassifikation von Myositiden? Zeitschrift für Rheumatologie 1993; 52: 259 - 263.

**Symbols used with DRG Assays**

Symbol	English	Deutsch	Français	Español	Italiano
	Consult instructions for use	Gebrauchsanweisung beachten	Consulter les instructions d'utilisation	Consulte las instrucciones de uso	Consultare le istruzioni per l'uso
	European Conformity	CE-Konformitätskennzeichnung	Conformité aux normes européennes	Conformidad europea	Conformità europea
	In vitro diagnostic device	In-vitro-Diagnostikum	Usage Diagnostic in vitro	Para uso Diagnóstico in vitro	Per uso Diagnostica in vitro
	For research use only	Nur für Forschungszwecke	Seulement dans le cadre de recherches	Sólo para uso en investigación	Solo a scopo di ricerca
	Catalogue number	Katalog-Nr.	Numéro de catalogue	Número de catálogo	Numero di Catalogo
	Lot. No. / Batch code	Chargen-Nr.	Numéro de lot	Número de lote	Numero di lotto
	Contains sufficient for <n> tests/	Ausreichend für "n" Ansätze	Contenu suffisant pour "n" tests	Contenido suficiente para <n> ensayos	Contenuto sufficiente per "n" saggi
	Storage Temperature	Lagerungstemperatur	Température de conservation	Temperatura de conservación	Temperatura di conservazione
	Expiration Date	Mindesthaltbarkeits-datum	Date limite d'utilisation	Fecha de caducidad	Data di scadenza
	Legal Manufacturer	Hersteller	Fabricant	Fabricante	Fabbricante
Distributed by	Distributor	Vertreiber	Distributeur	Distribuidor	Distributore
Content	Content	Inhalt	Conditionnement	Contenido	Contenuto
Volume/No.	Volume / No.	Volumen/Anzahl	Volume/Quantité	Volumen/Número	Volume/Quantità

Symbol	Portugues	Dansk	Svenska	Ελληνικά
	Consulte as instruções de utilização	Se brugsanvisning	Se bruksanvisningen	Εγχειρίδιο χρήστη
	Conformidade com as normas europeias	Europaeisk overensstemmelse	Europeisk överensstämmelse	Ευρωπαϊκή Συμμόρφωση
	Diagnóstico in vitro	In vitro diagnostik	Diagnostik in vitro	in vitro διαγνωστικό
				
	Catálogo n.º	Katalognummer	Katalog nummer	Αριθμός καταλόγου
	No do lote	Lot nummer	Batch-nummer	Αριθμός Παρτίδος
		Indeholder tilstrækkeligt til "n" test	Innehåller tillräckligt till "n" tester	Περιεχόμενο επαρκές για «n» εξετάσεις
	Temperatura de conservação	Opbevarings-temperatur	Förvaringstemperatur	Θερμοκρασία αποθήκευσης
	Prazo de validade	Udløbsdato	Bäst före datum	Ημερομηνία λήξης
	Fabricante	Producent	Tillverkare	Κατασκευαστής
Distributed by				
Content	Conteúdo	Indhold	Innehåll	Περιεχόμενο
Volume/No.	Volume/Número	Volumen/antal	Volym/antal	Όγκος/αριθ..