

# ENAscreen N

- 96 determinations -



IVD *In vitro* diagnostic device

Enzyme immunoassay for the determination of IgG antibodies to nuclear and cytoplasmic antigens in human serum and plasma

<b>REF</b>	Catalogue number	<b>LOT</b>	Batch code
	Consult accompanying documents		Manufactured by
	Temperature limitation		Use by
	Consult operating instruction		Biological risk



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## INTENDED USE

**ENAscreen N is used for the semi-quantitative determination (screening) of autoantibodies to nuclear and cytoplasmic antigens (RNP, Sm, SS-A, SS-B, Scl-70, Jo-1, histones, nucleosomes) in human serum and plasma for the differential diagnosis of systemic rheumatic inflammatory diseases.**

Systemic autoimmune diseases such as systemic lupus erythematosus, scleroderma, rheumatoid arthritis, Sjögren's syndrome, dermatomyositis, mixed connective tissue disease are characterized by the appearance of a variety of autoantibodies directed against components of the cell nucleus.

Although significance and pathological relevance of some autoantibodies are not completely revealed yet, the detection of autoantibodies is widely established and plays an important role in the diagnosis of systemic autoimmune diseases (1,2,3).

**ENAscreen N** allows the simultaneous detection of autoantibodies to the extractable nuclear antigens SS-A(Ro), SS-B(La), Sm, RNP, Nucleosomes, Histones and Scl-70 as well as the cytoplasmic antigen Jo-1 in one sample.

**ENAscreen N** offers a rapid and handsome opportunity for the determination of the whole autoantibody pattern in systemic autoimmune diseases on one test plate. The use of specified recombinant antigens in combination with selected highly purified ones guarantees a maximum of specificity for these parameters.

- (1) Tan EM.: Antibodies to nuclear antigens (ANA) and their immunobiology and medicine. *Adv Immunol* 1982 33:167-240
- (2) von Mühlen CA, Tan EM: Autoantibodies in the diagnostic of systemic rheumatic diseases. *Semin Arthritis Rheum* 1995 24:323-358
- (3) Smeenk RJT: Antinuclear antibodies: cause of disease or caused by disease? *Rheumatol* 2000 39:581-584

## PRINCIPLE OF THE TEST

ENAscreen N is an enzyme immunoassay for the semi-quantitative determination of IgG antibodies to nuclear and cytoplasmic antigens.

Antibodies of the calibrator and diluted patient samples react with nuclear and cytoplasmic antigens immobilized on the solid phase of microtiter plates. Recombinant SS-B, RNP (68 kDa, A, C), Scl-70, Jo-1 and highly purified SS-A, Sm, nucleosomes and histones guarantee the specific binding of autoimmune antibodies of the specimen under investigation. Following an incubation period of 60 min at room temperature (RT), unbound sample components are removed by a wash step.

The bound IgG antibodies react specifically with anti-human-IgG conjugated to horseradish peroxidase (HRP). Within the incubation period of 30 min at RT, excessive conjugate is separated from the solid-phase immune complexes by the following wash step.

HRP converts the colorless substrate solution of 3,3',5,5'-tetramethylbenzidine (TMB) added into a blue product. The enzyme reaction is stopped by dispensing an acidic solution into the wells after 15 min at room temperature turning the solution from blue to yellow.

The optical density (OD) of the solution at 450 nm is directly proportional to the amount of specific antibodies bound. The cut-off is established by multiplying the OD of the calibrator with the corresponding factor. Patient ratios are calculated by dividing the respective OD of the specimen with the calculated cut-off OD.

## PATIENT SAMPLES

### Specimen collection and storage

Blood is taken by venipuncture. Serum is separated after clotting by centrifugation. Plasma can be used, too. Lipaemic, hemolytic or contaminated samples should not be run.

The samples may be kept at 2 - 8 °C for up to three days. Long-term storage requires - 20 °C. Repeated freezing and thawing should be avoided. If samples are to be used for several assays, initially aliquot samples and keep at - 20 °C.

### Preparation before use

Allow samples to reach room temperature prior to assay. Take care to agitate patient samples gently in order to ensure homogeneity.

**Note:** *Patient samples have to be diluted 1 + 100 (v/v), e.g. 10 µl sample + 1 ml sample diluent (C), prior to assay.*

## TEST COMPONENTS FOR 96 DETERMINATIONS

<b>A</b>	<b>Microtiter plate,</b>	1
<b>Ag</b> <b>96</b>	12 breakable strips per 8 wells (total 96 individual wells) coated with, RNP (68kDa, A, C), Sm, SS-A, SS-B, Scl-70, Jo-1, histones, and nucleosomes	vacuum sealed with desiccant
<b>B</b>	<b>Concentrated wash buffer</b>	100 ml
<b>BUF</b> <b>WASH</b>	sufficient for 1000 ml solution	concentrate capped white
	<b>10x</b>	
<b>C</b>	<b>Sample diluent</b>	100 ml
<b>DIL</b>		ready for use capped black
<b>D</b>	<b>Conjugate</b>	15 ml
<b>CONJ</b>	containing anti-human-IgG coupled with HRP	ready for use capped red
<b>E</b>	<b>Substrate</b>	15 ml
<b>SOLN</b> <b>TMB</b>	3,3',5,5'-tetramethylbenzidine in citrate buffer containing hydrogen peroxide	ready for use capped blue
<b>F</b>	<b>Stop solution</b>	15 ml
<b>H2SO4</b>	0.25 M sulfuric acid	ready for use capped yellow
	<b>0.25M</b>	
<b>Ca</b>	<b>Calibrator</b>	1 ml
<b>CAL</b>	(diluted serum) factor: see leaflet enclosed	ready for use
<b>N</b>	<b>Negative control</b>	1 ml
<b>CONTROL</b>	(diluted serum)	ready for use

### Materials required

- micropipette 100 - 1000 µl
- micropipette 10 - 100 µl
- multi-channel pipette 50 - 200 µl
- trough for multi-channel pipette
- pipette tips
- glassware
- 8-channel wash comb with vacuum pump and waste bottle or microplate washer
- microplate reader with optical filters for 450 nm and 620 or 690 nm
- distilled or de-ionized water

### Size and storage

ENAscreen N has been designed for 96 determinations.

The expiry date of each component is reported on its respective label that of the complete kit on the box labels.

Upon receipt, all components of the ENAscreen N have to be kept at 2 - 8 °C, preferably in the original kit box.

After opening all kit components are stable for at least 2 months, provided proper storage.

### Preparation before use

Allow all components to reach room temperature prior to use in the assay.

The microtiter plate is vacuum-sealed in a foil with desiccant. The plate consists of a frame and strips with breakable wells. Allow the sealed microplate to reach room temperature before opening. Unused wells should be stored refrigerated and protected from moisture in the original cover carefully resealed.

Prepare a sufficient amount of wash solution by diluting the concentrated wash solution 10 times (1 + 9) with de-ionized or distilled water. For example, dilute 8 ml of the concentrate with 72 ml of distilled water. The wash solution prepared is stable at 2 - 8°C up to 30 days.

Make sure the soak time of the wash buffer in the wells is at least 5 seconds per wash cycle.

All other kit components are ready for use.

Avoid exposure of the TMB substrate solution to light!

## ASSAY PROCEDURE

- Dilute patient sera with sample diluent (C) 1 + 100 (v/v), e.g. 10 µl sample + 1 ml sample diluent (C).
- Avoid any time shift during pipetting of reagents and samples.

1. Bring all reagents to room temperature (18-25°C) before use. Mix gently without causing foam.
2. Dispense  
**100 µl** calibrator (Ca)  
**100 µl** negative control (N)  
**100 µl** diluted patient samples into the respective wells.
3. Cover plate, incubate **60 min** at room temperature (18...25°C).
4. Decant, then wash each well **three** times using **300 µl** wash solution (made of B).
5. Add **100 µl** of conjugate (D) solution to each well.
6. Cover plate, incubate **30 min** at room temperature (18...25°C).
7. Decant, then wash each well **three** times using **300 µl** wash solution (made of B).
8. Add **100 µl** of substrate (E) to each well.
9. Incubate **15 min protected from light** at room temperature (18...25°C).
10. Add **100 µl** of stop solution (F) to each well and mix gently.
11. Read the OD at **450 nm** versus 620 or 690 nm within 30 min after adding the stop solution.

## DATA PROCESSING

Results are interpreted qualitatively by calculating a cut-off value (A) or semi-quantitatively by calculating the binding index (BI) for each sample (B) on the basis of the cut-off determined:

$$OD_{\text{calibrator}} \times \text{factor} = OD_{\text{cut-off}} \text{ antigen}$$

The factor for calculation is stated in the control certificate provided in the kit. **The factor value may vary from lot to lot.**

Example:

$$OD_{\text{calibrator}} = 0.994$$

$$\text{factor} = 0.5$$

$$OD_{\text{cut-off}} = 0.994 \times 0.5 = 0.497$$

(B) For the calculation of the binding index (ratio) the following formula should be applied:

$$BI = OD_{\text{sample}} / OD_{\text{cut-off}}$$

Example:

$$OD_{\text{cut-off}} = 0.497$$

$$OD_{\text{sample}} = 1.873$$

$$BI = 1.873 / 0.497 = 3.7$$

This calculation can be performed by the integrated evaluation software of most microplate readers used, too.

## REFERENCE VALUES

ENAscreen N	BI
Positive	$\geq 1.0$
Negative	$< 1.0$

It is recommended that each laboratory establishes its own normal and pathological reference ranges, as usually done for other diagnostic parameters, too. Therefore, the above mentioned reference values provide a guide only to values which might be expected.

### Test validity

The test run is valid if:

- the mean OD of the calibrator is  $\geq 0.7$
- the mean OD of the negative control  $\leq 0.3$

If the above mentioned quality criteria are not met, repeat the test and make sure that the test procedure is followed correctly (incubation times and temperatures, sample and wash buffer dilution, wash steps etc.). In case of repeated failure of the quality criteria contact your supplier.

## Limitations of Method

Healthy individuals should be tested negative by the ENAscreen. However, ANA/ENA positive apparently healthy persons do occur.

Any clinical diagnosis should not be based on the results of in vitro diagnostic methods alone. Physicians are supposed to consider all clinical and laboratory findings possible to state a diagnosis.

## PERFORMANCE CHARACTERISTICS

### Calibration

Due to the lack of international reference materials results are interpreted by calculating a BI (ratio).

### Sensitivity

The analytical sensitivity of the ENAscreen N is about 0.2.

### Precision

Intraassay		Interassay	
mean OD	CV %	mean OD	CV %
0,523	4,3	0,501	5,2
1,013	3,5	0,977	4,6
2,231	4,5	1,991	6,5

### REMARKS:

## INCUBATION SCHEME

# ENAscreen N (4013)

<b>Dilute patients sample</b>	<b>10 µl sample + 1 ml sample diluent (C)</b>
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1	Bring all ready for use reagents to room temperature (18...25°C) before use.				
		calibrator	control	sera	
2	Pipette	Calibrator (Ca) Negative Control (N) prediluted 1 + 100 patient sera	100 µl	100 µl	100 µl
3	Incubate 60 minutes at room temperature				
4	Wash Decant, Dispense 3 x 300 µl (made of B)				
5	Pipette conjugate (D)	100 µl	100 µl	100 µl	
6	Incubate 30 minutes at room temperature				
7	Wash Decant, Dispense 3 x 300 µl (made of B)				
8	Pipette substrate (E)	100 µl	100 µl	100 µl	
9	Incubate protected from light 15 minutes at room temperature				
10	Pipette stop solution (F)	100 µl	100 µl	100 µl	
11	Measure 450 nm versus 620 (690) nm				

## SAFETY PRECAUTIONS

- **This kit is for in vitro use only.** Follow the working instructions carefully. GA GENERIC ASSAYS GmbH and its authorized distributors shall not be liable for damages indirectly or consequentially brought about by changing or modifying the procedure indicated. The kit should be performed by trained technical staff only.
- The expiration dates stated on the respective labels are to be observed. The same relates to the stability stated for reconstituted reagents.
- Do not use or mix reagents from different lots.
- Do not use reagents from other manufacturers.
- All reagents should be kept at 2 - 8 °C in the original shipping container until use.
- Some of the reagents contain small amounts of Thimerosal (< 0.1 % w/v) and Kathon (1.0 % v/v) as preservatives. They must not be swallowed or allowed to come into contact with skin or mucosa.
- Source materials derived from human body fluids or organs used in the preparation of this kit were tested and found negative for HBsAg and for HIV as well as HCV antibodies. However, no known test guarantees the absence of such viral agents. Therefore, handle all components and all patient samples as if potentially hazardous.
- Since the kit contains potentially hazardous materials, the following precautions should be observed:
  - Do not smoke, eat or drink while handling kit material,
  - Always use protective gloves,
  - Never pipette material by mouth,
  - Wipe up spills promptly, washing the affected surface thoroughly with a decontaminant.