

# ENA 6 parameters profile

**Enzyme Immunoassay (ELISA) for the qualitative  
determination of IgG antibodies  
against Ro/SSA, La/SSB, U1-sn RNP68/70KDa,  
Sm, Scl-70, Jo-1  
in human serum and plasma**

- for "in vitro" diagnostic use only -



**DIA.PRO**

**Diagnostic Bioprobes Srl  
Via G. Carducci n° 27  
20099 Sesto San Giovanni  
(Milano) - Italy**

Phone +39 02 27007161

Fax +39 02 44386771

e-mail: [info@diapro.it](mailto:info@diapro.it)

REF ENA6PRO.CE  
12 Tests

## ENA 6 parameters profile

### A. INTENDED USE

The device ENA6PRO.CE is an Enzyme ImmunoAssay (ELISA) intended to be used for the qualitative determination of IgG autoantibodies against Ro/SSA, La/SSB, U1-sn RNP68/70KDa, Sm, Scl-70, Jo-1 in human plasma and sera. For in vitro diagnostic use only.

### B. INTRODUCTION

**Autoimmunity** is the failure of an organism to recognize its own constituent parts as *self*, which allows an immune response against its own cells and tissues. Any disease that results from such an aberrant immune response is termed an *Autoimmune Disease*.

*Rheumatoid autoimmune diseases* are often associated with *autoantibodies to Nuclear Antigens*. We can distinguish between *Anti Nuclear Antibodies (ANA)*, associate with autoimmune systemic diseases as SLE (Systemic Lupus Erythematosus), RA (Reumatoid Arthritis), Scleroderma, MCDT (Mixed Connective Tissue Disease) and Sjogren's Syndrome; and *Extractable anti Nuclear Antibodies (ENA)*, associate with autoimmune systemic disease as Polymyositis, SLE, MCDT and Sjogren's Syndrome.

The serological detection of extractable antinuclear antibodies (ENA) in patient with suspected autoimmune disorders is common practice in every immunological laboratory. When this first diagnostic step is performed with positive results, we can go along with the isolate detection and quantification of the individual antibodies.

### C. PRINCIPLE OF THE TEST

Microplates are coated by strips with ENA recombinant or purified Antigens specific: Ro/SSA, La/SSB, U1-sn RNP68/70KDa Sm, Scl-70, Jo-1.

Position	Autoantigen	Composition
A	Human Serum Albumin	Negative Control
B	SSA	Rec Ag
C	SSB	Rec Ag
D	U1-sn RNP68/70KDa	Rec Ag
E	Sm	Native Ag
F	Scl-70	Rec Ag
G	Jo-1	Rec Ag
H	hIgG	Positive Control

In the 1<sup>st</sup> incubation, the solid phase is treated with diluted samples and anti nuclear IgG are captured, if present, by the solid phase.

After washing out all the other components of the sample, in the 2<sup>nd</sup> incubation bound anti nuclear IgG are detected by the addition of anti hIgG antibody, labelled with peroxidase (HRP).

The enzyme captured on the solid phase, acting on the substrate/chromogen mixture, generates an optical signal that is proportional to the amount of anti nuclear IgG antibodies present in the sample. The presence of IgG in the sample may therefore be determined by means of a cut-off value able to discriminate between negative and positive samples.

Controls are included to provide an internal check of the analytical system.

### D. COMPONENTS

Each kit contains sufficient reagents to perform 12 tests.

#### 1. Microplate: MICROPLATE

N°1. 12 strips x 8 breakable wells coated strip by strip with specific Recombinants and Native Antigen (Sm), in presence of bovine proteins. The strip A and H are coated with Internal Controls (Positive and Negative). Plates are sealed into a bag with desiccant. Allow the microplate to reach room temperature before opening; reseal unused strips in the bag with desiccant and store at 4°C.

#### 2. Negative Control: CONTROL -

1x2.0 ml/vial. It contains, human Serum negative for ENA IgG antibodies, 2% casein, 10 mM Na-citrate buffer pH 6.0 +/-0.1, 0.2% Tween 20, 10% Fetal Calf Serum (FCS), 0.09% Na-azide and 0.045% ProClin 300 as preservatives. The Negative Control is yellow color coded.

#### 3. Positive Control: CONTROL +

1x2.0 ml/vial. It contains, human Serum positive for ENA IgG antibodies, 2% casein, 10 mM Na-citrate buffer pH 6.0 +/-0.1, 0.2% Tween 20, 10% Fetal Calf Serum (FCS), 0.09% Na-azide and 0.045% ProClin 300 as preservatives. The Positive Control is green color coded.

#### 4. Wash buffer concentrate: WASHBUF 20X

1x60ml/bottle20x concentrated solution. Once diluted, the wash solution contains 10 mM phosphate buffer pH 7.0+/-0.2, 0.05% Tween 20 and 0.045% ProClin 300.

#### 5. Enzyme conjugate: CONJ

1x16ml/vial. Ready to use and red colour coded. It contains Horseradish peroxidase conjugated goat polyclonal antibodies to human IgG, 5% BSA, 10 mM Tris buffer pH 6.8+/-0.1, 0.045% ProClin 300 and 0.02% gentamicine sulphate as preservatives.

#### 6. Chromogen/Substrate: SUBS TMB

1x16ml/vial. It contains 50 mM citrate-phosphate buffer pH 3.5-3.8, 4% dimethylsulphoxide, 0.03% tetra-methylbenzidine (or TMB) and 0.02% hydrogen peroxide (or H<sub>2</sub>O<sub>2</sub>).  
*Note: To be stored protected from light as sensitive to strong illumination.*

#### 7. Sulphuric Acid: H2SO4 0.3 M

1x15ml/vialIt contains 0.3 M H<sub>2</sub>SO<sub>4</sub> solution.  
Attention: Irritant (H315, H319; P280, P302+P352, P332+P313, P305+P351+P338, P337+P313, P362+P363).

#### 8. Specimen Diluent: DILSPE

1x20ml/vial. Ready to use and blue colour coded. It contains 2% casein, 10 mM Na-citrate buffer pH 6.0 +/-0.1, 0.2% Tween 20, 10% Fetal Calf Serum (FCS), 0.09% Na-azide and 0.045% ProClin 300 as preservatives. To be used to dilute the sample.

#### 9. Plate sealing foils n°2

#### 10. Package insert n°1

### E. MATERIALS REQUIRED BUT NOT PROVIDED

1. Calibrated Micropipettes (1000, 100 and 10ul) and disposable plastic tips.
2. EIA grade water (bidistilled or deionised, charcoal treated to remove oxidizing chemicals used as disinfectants).
3. Timer with 60 minute range or higher.
4. Absorbent paper tissues.
5. Calibrated ELISA microplate thermostatic incubator (dry or wet) set at +37°C (+/-0.5°C tolerance).
6. Calibrated ELISA microwell reader with 450nm (reading) and with 620-630nm (blinking) filters.
7. Calibrated ELISA microplate washer.
8. Vortex or similar mixing tools.

## F. WARNINGS AND PRECAUTIONS

1. The kit has to be used by skilled and properly trained technical personnel only, under the supervision of a medical doctor responsible of the laboratory.
2. All the personnel involved in performing the assay have to wear protective laboratory clothes, talc-free gloves and glasses. The use of any sharp (needles) or cutting (blades) devices should be avoided. All the personnel involved should be trained in biosafety procedures, as recommended by the Center for Disease Control, Atlanta, U.S. and reported in the National Institute of Health's publication: "Biosafety in Microbiological and Biomedical Laboratories", ed. 1984.
3. All the personnel involved in sample handling should be vaccinated for HBV and HAV, for which vaccines are available, safe and effective.
4. The laboratory environment should be controlled so as to avoid contaminants such as dust or air-borne microbial agents, when opening kit vials and microplates and when performing the test. Protect the Chromogen (TMB) from strong light and avoid vibration of the bench surface where the test is undertaken.
5. Upon receipt, store the kit at 2..8°C into a temperature controlled refrigerator or cold room.
6. Do not interchange components between different lots of the kits. It is recommended that components between two kits of the same lot should not be interchanged.
7. Check that the reagents are clear and do not contain visible heavy particles or aggregates. If not, advise the laboratory supervisor to initiate the necessary procedures for kit replacement.
8. Avoid cross-contamination between serum/plasma samples by using disposable tips and changing them after each sample. Do not reuse disposable tips.
9. Avoid cross-contamination between kit reagents by using disposable tips and changing them between the use of each one. Do not reuse disposable tips.
10. Do not use the kit after the expiration date stated on the external container and internal (vials) labels. A study conducted on an opened kit did not pointed out any relevant loss of activity up to six uses of the device and up to 3 months.
11. Treat all specimens as potentially infective. All human serum specimens should be handled at Biosafety Level 2, as recommended by the Center for Disease Control, Atlanta, U.S. in compliance with what reported in the Institutes of Health's publication: "Biosafety in Microbiological and Biomedical Laboratories", ed. 1984.
12. The use of disposable plastic-ware is recommended in the preparation of the liquid components or in transferring components into automated workstations, in order to avoid cross contamination.
13. Waste produced during the use of the kit has to be discarded in compliance with national directives and laws concerning laboratory waste of chemical and biological substances. In particular, liquid waste generated from the washing procedure, from residuals of controls and from samples has to be treated as potentially infective material and inactivated before waste. Suggested procedures of inactivation are treatment with a 10% final concentration of household bleach for 16-18 hrs or heat inactivation by autoclave at 121°C for 20 min..
14. Accidental spills from samples and operations have to be adsorbed with paper tissues soaked with household bleach and then with water. Tissues should then be discarded in proper containers designated for laboratory/hospital waste.
15. The Sulphuric Acid is an irritant. In case of spills, wash the surface with plenty of water
16. Other waste materials generated from the use of the kit (example: tips used for samples and controls, used microplates) should be handled as potentially infective and disposed according to national directives and laws concerning laboratory wastes.

## G. SPECIMEN: PREPARATION AND WARNINGS

1. Blood is drawn aseptically by venepuncture and plasma or serum is prepared using standard techniques of preparation of samples for clinical laboratory analysis. No influence has been observed in the preparation of the sample with citrate, EDTA and heparin.
2. Samples have to be clearly identified with codes or names in order to avoid misinterpretation of results. Bar code labeling and electronic reading is strongly recommended.
3. Haemolysed ("red") and visibly hyperlipemic ("milky") samples have to be discarded as they could generate false results. Samples containing residues of fibrin or heavy particles or microbial filaments and bodies should be discarded as they could give rise to false results.
4. Sera and plasma can be stored at +2°...+8°C in primary collection tubes for up to five days after collection. Do not freeze primary tubes of collection. For longer storage periods, sera and plasma samples, carefully removed from the primary collection tube, can be stored frozen at -20°C for at least 12 months. Any frozen samples should not be frozen/thawed more than once as this may generate particles that could affect the test result.
5. If particles are present, centrifuge at 2.000 rpm for 20 min or filter using 0.2-0.8µ filters to clean up the sample for testing.

## H. PREPARATION OF COMPONENTS AND WARNINGS

### Microplate:

Allow the microplate to reach room temperature (about 1 hr) before opening the container. Check that the desiccant is not turned to dark green, indicating a defect of manufacturing.

In this case call Dia.Pro's customer service.

Unused strips have to be placed back into the aluminium pouch, in presence of desiccant supplied, firmly zipped and stored at +2°.8°C. When opened the first time, residual strips are stable till the indicator of humidity inside the desiccant bag turns from yellow to green.

### Negative and Positive Controls:

Ready to use component. Mix carefully on vortex before use.

### Wash buffer concentrate:

The whole content of the concentrated solution has to be diluted 20x with bidistilled water and mixed gently end-over-end before use. During preparation avoid foaming as the presence of bubbles could impact on the efficiency of the washing cycles.

*Note: Once diluted, the wash solution is stable for 1 week at +2..8° C.*

### Enzyme conjugate:

Ready to use. Mix well on vortex before use.

Be careful not to contaminate the liquid with oxidizing chemicals, air-driven dust or microbes.

If this component has to be transferred use only plastic, possibly sterile disposable containers.

### Chromogen/Substrate:

Ready to use. Mix well on vortex before use.

Be careful not to contaminate the liquid with oxidizing chemicals, air-driven dust or microbes.

Do not expose to strong illumination, oxidizing agents and metallic surfaces.

If this component has to be transferred use only plastic, possible sterile disposable container

### Specimen Diluent:

Ready to use component. Mix carefully on vortex before use.

### Sulphuric Acid:

Ready to use. Mix well on vortex before use.

Attention: Irritant (H315, H319; P280, P302+P352, P332+P313, P305+P351+P338, P337+P313, P362+P363).

Legenda:

**Warning H statements:**

**H315** – Causes skin irritation.

**H319** – Causes serious eye irritation.

**Precautionary P statements:**

**P280** – Wear protective gloves/protective clothing/eye protection/face protection.

**P302 + P352** – IF ON SKIN: Wash with plenty of soap and water.

**P332 + P313** – If skin irritation occurs: Get medical advice/attention.

**P305 + P351 + P338** – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**P337 + P313** – If eye irritation persists: Get medical advice/attention.

**P362 + P363** – Take off contaminated clothing and wash it before reuse.

## I. INSTRUMENTS AND TOOLS USED IN COMBINATION WITH THE KIT

1. Micropipettes have to be calibrated to deliver the correct volume required by the assay and must be submitted to regular decontamination (household alcohol, 10% solution of bleach, hospital grade disinfectants) of those parts that could accidentally come in contact with the sample. They should also be regularly maintained in order to show a precision of 1% and a trueness of +/-2%. Decontamination of spills or residues of kit components should also be carried out regularly.
2. The ELISA incubator has to be set at +37°C (tolerance of +/-0.5°C) and regularly checked to ensure the correct temperature is maintained. Both dry incubators and water baths are suitable for the incubations, provided that the instrument is validated for the incubation of ELISA tests.
3. The **ELISA washer** is extremely important to the overall performances of the assay. The washer must be carefully validated in advance, checked for the delivery of the right dispensation volume and regularly submitted to maintenance according to the manufacturer's instructions for use. In particular the washer, at the end of the daily workload, has to be extensively cleaned out of salts with deionized water. Before use, the washer has to be extensively primed with the diluted Washing Solution. The instrument weekly has to be submitted to decontamination according to its manual (NaOH 0.1 M decontamination suggested).  
5 washing cycles (aspiration + dispensation of 350ul/well of washing solution + 20 sec soaking = 1 cycle) are sufficient to ensure the assay with the declared performances. If soaking is not possible add one more cycle of washing.  
An incorrect washing cycle or salt-blocked needles are the major cause of false positive reactions.
4. Incubation times have a tolerance of ±5%.
5. The ELISA microplate reader has to be equipped with a reading filter of 450nm and with a second filter (620-630nm, mandatory) for blanking purposes. Its standard performances should be (a) bandwidth ≤ 10 nm; (b) absorbance range from 0 to ≥ 2.0; (c) linearity to ≥ 2.0; repeatability ≥ 1%. The optical system of the reader has to be calibrated regularly to ensure that the correct optical density is measured. It should be regularly maintained according to the manufacturer 's instructions.

6. When using an ELISA automated work station, all critical steps (dispensation, incubation, washing, reading, data handling) have to be carefully set, calibrated, controlled and regularly serviced in order to match the values reported in the section "Internal Quality Control". The assay protocol has to be installed in the operating system of the unit and validated as for the washer and the reader. In addition, the liquid handling part of the station (dispensation and washing) has to be validated and correctly set. Particular attention must be paid to avoid carry over by the needles used for dispensing and for washing. This must be studied and controlled to minimize the possibility of contamination of adjacent wells. The use of ELISA automated work stations is recommended when the number of samples to be tested exceed 20-30 units per run.
7. Dia.Pro's customer service offers support to the user in the setting and checking of instruments used in combination with the kit, in order to assure compliance with the requirements described. Support is also provided for the installation of new instruments to be used with the kit.

## L. PRE ASSAY CONTROLS AND OPERATIONS

1. Check the expiration date of the kit printed on the external label (primary container). Do not use if expired.
2. Check that the liquid components are not contaminated by visible particles or aggregates.
3. Check that the Chromogen (TMB) is colourless or pale blue by aspirating a small volume of it with a sterile plastic pipette.
4. Check that no breakage occurred in transportation and no spillage of liquid is present inside the box (primary container). Check that the aluminium pouch, containing the microplate, is not punctured or damaged.
5. Dilute all the content of the 20x concentrated Wash Solution as described above.
6. Allow all the other components to reach room temperature (about 1 hr) and then mix gently on vortex all liquid reagents.
7. Set the ELISA incubator at +37°C and prepare the ELISA washer by priming with the diluted washing solution, according to the manufacturers instructions. Set the right number of washing cycles as reported in the specific section.
8. Check that the ELISA reader is turned on or ensure it will be turned on at least 20 minutes before reading.
9. If using an automated work station, turn on, check settings and be sure to use the right assay protocol.
10. Check that the micropipettes are set to the required volume.
11. Check that all the other equipment is available and ready to use.
12. In case of problems, do not proceed further with the test and advise the supervisor.

## M. ASSAY PROCEDURE

The assay has to be carried out according to what reported below, taking care to maintain the same incubation time for all the samples in testing.

1. Dilute samples 1:101 into a properly defined dilution tube (example: 1000 µl Sample Diluent + 10 µl sample). Do not dilute the Controls as they are ready to use. Mix carefully all the liquid components on vortex and then proceed as described below.
2. Place the required number of Microwells in the microwell holder.

3. Then dispense 100 µl of Negative, Positive Controls and diluted samples in each well into one strip module according to the following example table:

		Microplate											
Casein	A	1	2	3	4	5	6	7	8	9	10	11	12
SSA	B	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
SSB	C	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
RNP-68	D	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
5m	E	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Scl-70	F	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Jo-1	G	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
hlgG	H	NC	PC	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10

Legenda: NC=Negative Control PC=Positive Control S=Sample

4. Incubate the microplate for **45 min at +37°C**.

**Important note:** Strips have to be sealed with the adhesive sealing foil, supplied, only when the test is carried out manually. Do not cover strips when using ELISA automatic instruments.

5. Wash the microplate with an automatic washer reported previously (section I.3).  
6. Pipette 100 µl Enzyme Conjugate into each strip and cover with the sealer. Check that this red coloured component has been dispensed in all the wells.

**Important note:** Be careful not to touch the plastic inner surface of the well with the tip filled with the Enzyme Conjugate. Contamination might occur.

7. Incubate the microplate for **45 min at +37°C**.  
8. Wash microwells as in step 5.  
9. Pipette 100 µl Chromogen/Substrate mixture into each well. Then incubate the microplate at **room temperature (18-24°C) for 15 minutes**.

**Important note:** Do not expose to strong direct illumination. High background might be generated.

10. Pipette 100 µl Sulphuric Acid to stop the enzymatic reaction into all the wells. Addition of acid will turn the positive control and the positive samples from blue to yellow.  
11. Measure the colour intensity of the solution in each well, as described in section I.5, at 450nm filter (reading) and at 620-630nm (background subtraction, mandatory).

#### General Important notes:

- Ensure that no finger prints are present on the bottom of the microwell before reading. Finger prints could generate false positive results on reading.
- Reading has to be carried out just after the addition of the Stop Solution and anyway not any longer than 20 minutes after its addition. Some self oxidation of the chromogen can occur leading to high background.

#### N. ASSAY SCHEME

Method	Operations
Controls	100 µl
Samples diluted 1:101	100 µl
<b>1<sup>st</sup> incubation</b>	<b>45 min</b>
Temperature	+37°C
Wash step	n° 5 cycles with 20" of soaking OR n° 6 cycles without soaking
Enzyme conjugate	100 µl
<b>2<sup>nd</sup> incubation</b>	<b>45 min</b>
Temperature	+37°C

Wash step	n° 5 cycles with 20" of soaking OR n° 6 cycles without soaking
TMB/H2O2	100 µl
<b>3<sup>rd</sup> incubation</b>	<b>15 min</b>
Temperature	r.t.
Sulphuric Acid	100 ul
Reading OD	450nm

#### O. INTERNAL QUALITY CONTROL

A validation check is carried out on the controls any time the kit is used in order to verify whether the performances of the assay are as qualified.

Control that the following data are matched:

Check	Requirements
A well	< 0.200 OD450nm value
H well	> 0.750 OD450nm value
Negative Control (NC)	< 0.200 OD450nm value in all wells from B to G
Positive Control (PC)	> 0.750 OD450nm in all wells from B to G

If the results of the test match the requirements stated above, proceed to the next section.

If they do not, do not proceed any further and operate as follows:

Problem	Check
<b>A well</b> > 0.200 OD450nm value	1. that the Chromogen/Sustrate solution has not got contaminated during the assay
<b>Negative Control</b> > 0.200 OD450nm value in well from B to G coefficient of variation > 30%	1. that the washing procedure and the washer settings are as validated in the pre qualification study; 2. that the proper washing solution has been used and the washer has been primed with it before use; 3. that no mistake has been done in the assay procedure (dispensation of a positive control instead of the negative one); 4. that no contamination of the negative control or of their wells has occurred due spills of positive samples or the enzyme conjugate; 5. that micropipettes haven't got contaminated with positive samples or with the enzyme conjugate 6. that the washer needles are not blocked or partially obstructed.
<b>Positive Control</b> OD450nm < 0.750 in wells from B to G	1. that the procedure has been correctly executed; 2. that no mistake has been done in its distribution (ex.: dispensation of a wrong control instead); 3. that the washing procedure and the washer settings are as validated in the pre qualification study; 4. that no external contamination of the control has occurred.
<b>H well</b> < 0.750 value	1. that the procedure has been correctly executed; 2. that no mistake has been done in the distribution of the Enzyme Conjugate 3. that the washing procedure and the washer settings are as validated in the pre qualification study; 4. that no external contamination of the Enzyme Conjugate has occurred.

Should one of these problems have happened, after checking, report to the supervisor for further actions.

## P. RESULTS

If the test turns out to be valid, results are calculated from the mean OD450nm/620-630nm value of the A1 and A2 wells by means of a cut-off value (Co) determined with the following formula:

$$\text{Cut-off} = \text{mean}(A1+A2) + 0.300$$

The value found for the test is used for the interpretation of results as described in the next paragraph.

**Importante note:** When the calculation of results is performed by the operating system of an ELISA automated work station, ensure that the proper formulation is used to generate the correct interpretation of results.

## Q. INTERPRETATION OF RESULTS

The device ENA6PRO.CE which contains 6 antigens species gives a clear indication whether a sample is negative or positive with respect to a particular antibody.

Test results parameter by parameter, are interpreted as a ratio of the sample OD450nm/620-630nm value (S) and the cut-off value (Co), or S/Co, according to the following table:

S/Co	Interpretation
< 0.8	Normal
$0.8 \leq S/Co < 1.2$	Borderline
$\geq 1.2$	Elevated

A normal result indicates that the patient has not developed ENA IgG antibodies .

Any patient showing an equivocal result should be retested on a second sample taken 1-2 weeks after the initial sample and/or retested using an ELISA kit specific for the quantification of the single autoantibody.

An elevated result indicates that the patient has developed ENA IgG antibodies .

An example of calculation is reported below:

### Important note:

The following data must not be used instead of the real figures obtained by the user.

Values A1-A2: 0.025-0.070 OD450nm/620-630nm  
Mean value: 0.048 OD450nm/620-630nm

Cut-Off= 0.048+0.300= 0.348 OD450nm/620-630nm

		NC	PC	S1
		1	2	3
Casein	A	0.025	0.070	0.030
SSA	B	0.058	3.998	3.998
SSB	C	0.023	3.343	2.873
RNP-68	D	0.032	1.909	0.071
Sm	E	0.039	2.339	0.090
Scl-70	F	0.023	1.396	0.071
Jo-1	G	0.018	2.209	0.046
hIgG	H	2.116	2.313	1.902

Legenda: NC=Negative Control PC=Positive Control S=Sample

*Negative Control:* < 0.200 OD450nm/620-630nm value in wells from B1 to G1; S/Co < 0.8 - accepted

*Positive Control:* > 0.750 OD450nm/620-630nm value in wells from B2 to G2; S/Co > 1.2 - accepted

*Sample 1:* A3 well < 0.200 OD450nm/620-630nm value - accepted  
B3 well 3.998 OD450nm/620-630nm  
- S/Co > 1.2 - elevated for SSA  
C3 well 2.873 OD450nm/620-630nm  
- S/Co > 1.2 - elevated for SSB  
D3 well 0.071 OD450nm/620-630nm  
- S/Co < 0.8 - normal for U1-sn RNP68/70KDa  
E3 well 0.090 OD450nm/620-630nm  
- S/Co < 0.8 - normal for Sm  
F3 well 0.071 OD450nm/620-630nm  
- S/Co < 0.8 - normal for Scl70  
G3 well 0.046 OD450nm/620-630nm  
- S/Co < 0.8 - normal for Jo1  
H3 well > 0.750 OD450nm/620-630nm value - accepted

### Important notes:

- Results of this test alone are not enough to provide a clear diagnosis of a autoimmune disease. Other diagnostic tests should be carried out, especially the quantification of individual antibodies. 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.
- Interpretation of results should be done under the supervision of the laboratory supervisor to reduce the risk of judgment errors and misinterpretations.
- When test results are transmitted from the laboratory to another facility, attention must be paid to avoid erroneous data transfer.

## R. PERFORMANCE CHARACTERISTICS

Evaluation of Performances has been conducted on panels of positive and negative samples with reference to a CE marked reference kit.

### 1. Limit of detection

No international standard has been defined so far by the European Community.

In its absence, an Internal Gold Standard (or IGS), derived from a human plasma which contains all six autoantibodies with high concentration, has been defined in order to provide the device with a constant and excellent sensitivity.

The limit of detection has been calculated as mean OD450nm/620-630nm Negative Control A1 well + 5 SD.

The table below reports the mean OD450nm/620-630nm values of this standard when diluted and then examined in the assay.

### IGS OD450nm/620-630nm values:

		LP1	LP2
		1	2
Casein	A	0.084	0.062
SSA	B	3.998	3.998
SSB	C	3.170	2.986
RNP-68	D	1.699	1.511
Sm	E	2.236	1.861
Scl-70	F	1.202	1.004
Jo-1	G	2.241	1.949
hIgG	H	1.486	1.774

## 2. Diagnostic Sensitivity and Specificity:

The diagnostic sensitivity has been tested in a Performance Evaluation trial on panels of samples classified positive by a CE marked reference kit.

The diagnostic **sensitivity** was studied on at least 50 samples, positive with the reference kit. Positive samples were collected from patients with a clinical history of autoimmune disease.

The diagnostic **specificity** was determined on panels of at least 50 negative samples from normal individuals and blood donors, classified negative with the reference kit, including potentially interfering specimens.

Both plasma, derived with different standard techniques of preparation (citrate, EDTA and heparin), and sera have been used to determine the specificity. No false reactivity due to the method of specimen preparation has been observed.

Frozen specimens have also been tested to check whether samples freezing interferes with the performance of the test. No interference was observed on clean and particle free samples.

No cross-reactivities have been observed.

The Performance Evaluation provided the following values:

<b>Sensitivity</b>	≥ 98 %
<b>Specificity</b>	≥ 98 %

## 3. Precision:

The negative control and the positive control were used to verify this parameter, by testing 12 replicates of the same sample on two lots of product. The values of CV% obtained from this study ranged 4-20% depending on OD450nm/620-630nm values. The variability shown did not result in sample misclassification.

## S. LIMITATIONS

Bacterial contamination or heat inactivation of the specimen may affect the absorbance values of the samples with consequent alteration of the level of the analyte.

Frozen samples containing fibrin particles or aggregates after thawing may generate some false results.

This test is suitable only for testing single samples and not pooled ones.

Diagnosis of an autoimmune disease should not be established on the basis of a single test result. The patient's clinical history, symptomatology, as well as other diagnostic data should be considered.

False positivity has been assessed as less than 2% of the normal population.

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All the IVD Products manufactured by the company are under the control of a certified Quality Management System in compliance with EN ISO 13485 rule. Each lot is submitted to a quality control and released into the market only if conforming with the EC technical specifications and acceptance criteria.

Manufacturer:  
Dia.Pro Diagnostic Bioprobes S.r.l.  
Via G. Carducci n° 27 – Sesto San Giovanni (MI) – Italy

