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## User's Manual

# ANCA Profile ELISA

Enzyme immunoassay for the qualitative measurement of anti-neutrophil cytoplasmic antibodies (ANCA) in human serum or plasma.



**DE7040**



**96 wells**

## 1. INTENDED PURPOSE

ANCA Profile ELISA is a test system for the qualitative measurement of anti-neutrophil cytoplasmic antibodies (ANCA) directed against PR3, MPO, BPI, Elastase, Cathepsin G, Lysozyme and Lactoferrin in human serum or plasma. This product is intended for professional in vitro diagnostic use only. Anti-neutrophil cytoplasmic antibodies (ANCA) against proteinase 3 (PR3) or myeloperoxidase (MPO) are diagnostic markers for ANCA-associated vasculitides. PR3 is the landmark antigen in granulomatosis with polyangiitis (GPA, formerly: Wegener's granulomatosis). MPO differentiates microscopic polyangiitis (MPA) and eosinophilic granulomatosis with polyangiitis (EGPA). ANCA against lactoferrin, elastase, cathepsin-G, lysozyme, and bactericidal permeability-increasing protein (BPI) may occur in inflammatory rheumatic diseases and in chronic inflammatory intestinal conditions. The test supports the differential diagnosis of these diseases when used in combination with other laboratory and clinical findings.

## 2. PRINCIPLE OF THE TEST

Purified antigens PR3, MPO, BPI, Elastase, Cathepsin G, Lysozyme and Lactoferrin are coated on to individual rows A to H of the microwell plate.

The determination is based on an indirect enzyme linked immune reaction with the following steps: Specific antibodies in the patient sample bind to the antigen coated on the surface of the reaction wells. After incubation, a washing step removes unbound and unspecifically bound serum or plasma components. Subsequently added enzyme conjugate binds to the immobilized antibody-antigen-complexes. After incubation, a second washing step removes unbound enzyme conjugate. After addition of substrate solution the bound enzyme conjugate hydrolyses the substrate forming a blue coloured product. Addition of an acid stops the reaction generating a yellow end-product. The intensity of the yellow color correlates with the concentration of the antibody-antigen-complex and can be measured photometrically at 450 nm.

## 3. WARNINGS AND PRECAUTIONS

- All reagents of this kit are intended for professional in vitro diagnostic use only.
- 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 or HIV2, and so all human serum based reagents in this kit must be handled as though capable of transmitting infection.
- Bovine serum albumin (BSA) used in components has been tested for BSE and found negative.
- Avoid contact with the substrate TMB (3,3',5,5'-Tetramethyl-benzidine).
- Stop solution contains acid, classification is non-hazardous. Avoid contact with skin.
- Controls, Calibrators, Sample Buffer and Wash Buffer contain sodium azide (NaN<sub>3</sub>) 0.09% as preservative. This concentration is classified as non-hazardous.
- Enzyme conjugate contains ProClin 300 0.05% as preservative. This concentration is classified as non-hazardous.

During handling of all reagents, controls and serum samples observe the existing regulations for laboratory safety regulations and good laboratory practice:

- First aid measures: In case of skin contact, immediately wash thoroughly with water and soap. Remove contaminated clothing and shoes and wash before reuse. If system fluid comes into contact with skin, wash thoroughly with water. After contact with the eyes carefully rinse the opened eye with running water for at least 10 minutes. Get medical attention if necessary.
- Personal precautions, protective equipment and emergency procedures: Observe laboratory safety regulations. Avoid contact with skin and eyes. Do not swallow. Do not pipette by mouth. Do not eat, drink, smoke or apply makeup in areas where specimens or kit reagents are handled. When spilled, absorb with an inert material and put the spilled material in an appropriate waste disposal.
- Exposure controls / personal protection: Wear protective gloves of nitril rubber or natural latex. Wear protective glasses. Used according to intended use no dangerous reactions known.
- Conditions to avoid: Since substrate solution is light-sensitive. Store in the dark.
- For disposal of laboratory waste the national or regional legislation has to be observed.

Observe the guidelines for performing quality control in medical laboratories by assaying control sera.

#### 4. CONTENTS OF THE KIT

Sufficient for 96 determinations

1. **SORB MT** 1x divisible microplate consisting of 12 modules of 8 wells each. Ready to use.
2. **CONTROL A - C** 3x 1.5 ml Control A (negative), Control B (cut-off) and Control C (positive), containing ANCA antibodies in a serum/buffer matrix (PBS, BSA, detergent, NaN<sub>3</sub> 0.09%), yellow. Ready to use.
3. **SAM DIL 5x** 20 ml Sample Buffer, containing PBS, BSA, detergent, preservative NaN<sub>3</sub> 0.09%, yellow, 5 x conc.
4. **ENZ CONJ** 15 ml Enzyme Conjugate containing anti-human IgG antibodies, HRP labelled; PBS, BSA, detergent, preservative ProClin 300 0.05%, light red. Ready to use.
5. **SUB TMB** 15 ml TMB Substrate; containing 3,3', 5,5'- Tetramethylbenzidin, colorless. Ready to use.
6. **STOP SOLN** 15 ml Stop Solution; contains acid. Ready to use.
7. **WASH SOLN 50x** 20 ml Wash Buffer, containing Tris, detergent, preservative NaN<sub>3</sub> 0.09%; 50 x conc.
8. 1 Instruction for Use
9. 1 Certificate of Analysis

#### 5. MATERIALS REQUIRED

- Microplate reader capable of endpoint measurements at 450 nm; optional: reference filter at 620 nm
- Data reduction software
- Multi-channel dispenser or repeatable pipette for 100 µl
- Vortex mixer
- Pipettes for 10 µl, 100 µl and 1000 µl
- Laboratory timing device
- Distilled or deionised water
- Measuring cylinder for 1000 ml and 100 ml
- Plastic container for storage of the wash solution

This ELISA assay is suitable for use on open automated ELISA processors. Each assay has to be validated on the respective automated system. Detailed information is provided upon request.

#### 6. SPECIMEN COLLECTION, STORAGE AND HANDLING

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

#### 7. STORAGE AND STABILITY

- Store test kit at 2-8°C in the dark.
- Do not expose reagents to heat, sun, or strong light during storage and usage.
- Store microplate sealed and desiccated in the clip bag provided.
- Unopened reagents are stable until expiration of the kit. See labels for individual batch.
- Diluted Wash Solution and Sample Buffer are stable for at least 30 days when stored at 2-8°C. We recommend consumption on the same day.

**8. PROCEDURAL NOTES**

- Do not use kit components beyond their expiration dates.
- Do not interchange kit components from different lots and products.
- All materials must be at room temperature (20-28°C) prior to use.
- Prepare all reagents and samples. Once started, perform the test without interruption.
- Double determinations may be done. By this means pipetting errors may become obvious.
- Perform the assay steps only in the order indicated.
- Always use fresh sample dilutions.
- Pipette all reagents and samples into the bottom of the wells.
- To avoid carryover or contamination, change the pipette tip between samples and different kit controls.
- Wash microwells thoroughly and remove the last droplets of Wash Solution.
- All incubation steps must be accurately timed.
- Do not re-use microplate wells.

**9. PREPARATION OF REAGENTS**

**Wash Buffer**

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

**Sample Buffer**

Prior to use dilute the contents (20 ml) of one vial of sample buffer 5x concentrate with distilled or deionised water to a final volume of 100 ml.

**Preparation of samples**

Dilute patient samples 1:100 before the assay: Put 990 µl of prediluted sample buffer in a polystyrene tube and add 10 µl of sample. Mix well.

**Note:** Calibrators / Controls are ready to use and need not be diluted.

**10. TEST PROCEDURE**

Prepare enough microplate modules for all calibrators / controls and patient samples.

1. Pipette **100 µl** of calibrators, controls and prediluted patient samples into the wells.
2. Incubate for **30 minutes** at room temperature (20-28 °C).
3. Discard the contents of the microwells and **wash 3 times** with **300 µl** of wash solution.
4. Dispense **100 µl** of enzyme conjugate into each well.
5. Incubate for **15 minutes** at room temperature.
6. Discard the contents of the microwells and **wash 3 times** with **300 µl** of wash solution.
7. Dispense **100 µl** of TMB substrate solution into each well.
8. Incubate for **15 minutes** at room temperature
9. **Add 100 µl** of stop solution to each well of the modules
10. Incubate for **5 minutes** at room temperature.
11. Read the optical density at 450 nm (reference 600-690nm) and calculate the results. The developed colour is stable for at least 30 minutes. Read during this time.

**Example for a pipetting scheme:**

	1	2	3	4	5	6	7	8	9	10	11	12	Antigens coated in rows:
A	A	B	C										Reference
B	P1	P2	P3										PR3
C	P1	P2	P3										MPO
D	P1	P2	P3										BPI
E	P1	P2	P3										Elastase
F	P1	P2	P3										Cathepsin G
G	P1	P2	P3										Lysozym
H	P1	P2	P3										Lactoferrin

P1, ... patient sample A-C controls

**11. VALIDATION**

Test results are valid if the optical densities at 450 nm for calibrators / controls and the results for controls comply with the reference ranges indicated on the Certificate of Analysis enclosed in each test kit. If these quality control criteria are not met the assay run is invalid and should be repeated.

**12. CALCULATION OF RESULTS**

First for each antigen-coated row optical density (OD) of a sample is adjusted by a lot-specific factor stated in the certificate of analysis:

$$\text{OD sample adj.} = \text{OD sample} * \text{lot-specific factor}$$

For each antigen-coated row the OD sample adj. is expressed as Index value

$$\text{Index} = \text{OD sample adj.} / \text{OD Control B}$$

**13. PERFORMANCE CHARACTERISTICS****Calibration**

This assay system is calibrated in relative arbitrary units, since no international reference preparation is available for this assay.

**Measuring range**

not applicable

**Expected values**

In a normal range study with samples from healthy blood donors the following ranges have been established with this ELISA assay: Cut-off Index 1.0

**Interpretation of results**

Negative: Index < 1.0

Positive: Index ≥ 1.0

**Linearity**

Patient samples containing high levels of specific antibody were serially diluted in sample buffer. Activity for each dilution step was calculated as Index- Value.

Sample	Dilution	Observed Index	Expected Index	O/E %
PR3	1:100	3.7	3.7	100
	1:200	1.9	1.8	103
	1:400	1.0	0.9	103
MPO	1:100	3.4	3.4	100
	1:200	1.8	1.7	106
	1:400	0.9	0.9	100
BPI	1:100	3.8	3.8	100
	1:200	2.0	1.9	104
	1:400	0.9	0.9	100
Elastase	1:100	3.0	3.0	100
	1:200	1.6	1.5	105
	1:400	0.7	0.7	100
Cathepsin G	1:100	2.8	2.8	100
	1:200	1.3	1.4	91
	1:400	0.6	0.7	83
Lysozyme	1:100	3.1	3.1	100
	1:200	1.5	1.6	94
	1:400	0.7	0.8	91
Lactoferrin	1:100	3.6	3.6	100
	1:200	1.7	1.8	94
	1:400	0.8	0.9	89

**Limit of detection**

not applicable

**Reproducibility**

Intra-assay precision: Coefficient of variation (CV) was calculated for each of three samples from the results of 24 determinations in a single run. Results for precision-within-assay are shown in the table below.

Inter-assay precision: Coefficient of variation (CV) was calculated for each of three samples from the results of 6 determinations in 5 different runs. Results for run-to-run precision are shown in the table below.

Intra-Assay		
Sample	Mean Index	CV %
PR3	1.8	3.2
MPO	2.0	2.8
BPI	1.3	4.2
Elastase	1.3	4.6
Cathepsin G	1.4	5.1
Lysozym	1.1	4.5
Lactoferrin	1.9	3.0

Inter-Assay		
Sample	Mean Index	CV %
PR3	1.7	2.8
MPO	1.9	2.0
BPI	1.3	2.8
Elastase	1.2	3.3
Cathepsin G	1.4	2.8
Lysozym	1.0	3.7
Lactoferrin	1.8	2.4

**Interfering substances**

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

**Study results**

Study population	IFA	n	n Pos	%
ANCA vasculitis/ non ANCA vasculitis or other conditions	pos	102	92	90.2
healthy controls or non-rheumatological or non-ANCA vasculitis	neg	234	32	13.7

**Clinical Diagnosis**

	Pos	Neg	
Pos	92	32	
Neg	10	202	
	102	234	336

Sensitivity: 90.2 %

Specificity: 86.3 %

Overall agreement: 87.5 %

**14. LIMITATIONS OF THE PROCEDURE**

This assay 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 concerning the entire clinical picture of the patient. Also every decision for therapy should be taken individually.

The above pathological and normal reference ranges for antibodies in patient samples should be regarded as recommendations only. Each laboratory should establish its own ranges according to ISO 15189 or other applicable laboratory guidelines.

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- 1** Pipet **100 µl** calibrator, control or patient sample

→ Incubate for **30 minutes** at room temperature

→ Discard the contents of the wells and wash 3 times with **300 µl** wash solution
- 2** Pipet **100 µl** enzyme conjugate

→ Incubate for **15 minutes** at room temperature

→ Discard the contents of the wells and wash 3 times with **300 µl** wash solution
- 3** Pipet **100 µl** substrate solution

→ Incubate for **15 minutes** at room temperature
- 4** Add **100 µl** stop solution

→ Leave untouched for **5 minutes**

→ Read at **450 nm**

**SYMBOLS USED WITH DEMEDITEC ASSAYS**

Symbol	English	Deutsch	Français	Espanol	Italiano
	European Conformity	CE-Konformitätskennzeichnung	Conforme aux normes européennes	Conformidad europea	Conformità europea
	Consult instructions for use	Gebrauchsanweisung beachten	Consulter les instructions d'utilisation	Consulte las Instrucciones	Consultare le istruzioni per l'uso
	In vitro diagnostic device	In-vitro-Diagnostikum	Usage Diagnostic in vitro	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.	Référence	Número de catálogo	No. di Cat.
	Lot. No. / Batch code	Chargen-Nr.	No. de lot	Número de lote	Lotto no
	Contains sufficient for <n> tests/	Ausreichend für "n" Ansätze	Contenu suffisant pour "n" tests	Contenido suficiente para <n> ensayos	Contenuto sufficiente per "n" saggi
	Note warnings and precautions	Warnhinweise und Vorsichtsmaßnahmen beachten	Avertissements et mesures de précaution font attention	Tiene en cuenta y advertencias precauciones	Annoti avvisi e le precauzioni
	Storage Temperature	Lagerungstemperatur	Temperature de conservation	Temperatura de conservacion	Temperatura di conservazione
	Expiration Date	Mindesthaltbarkeitsdatum	Date limite d'utilisation	Fecha de caducidad	Data di scadenza
	Legal Manufacturer	Hersteller	Fabricant	Fabricante	Fabbricante
<i>Distributed by</i>	Distributor	Vertreiber	Distributeur	Distribuidor	Distributore