

## ORGENTEC Diagnostika GmbH

Carl-Zeiss-Straße 49-51

55129 Mainz - Germany

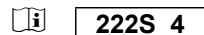
Phone: +49 (0) 61 31 / 92 58-0

Fax: +49 (0) 61 31 / 92 58-58

Internet: www.orgentec.com



Electronic Instruction For Use: version



## ORG 222S Rheumatoid Factor Screen

### INTENDED PURPOSE

Rheumatoid Factor Screen is an ELISA-based test system for the quantitative measurement of IgG, IgA and IgM class rheumatoid factor in human serum or plasma samples. This product is intended for professional in vitro diagnostic use only.

The test is used as an aid in the differential diagnosis of rheumatoid arthritis (RA), and presence of rheumatoid factors (RF) is an integral part of the current ACR criteria for classification of RA. In established RA, high titres of serum IgG and especially IgM RF indicate poor prognosis. The presence of either IgG or IgA RF in patients with long-standing RA may be a prognostic indicator of systemic manifestations. Evaluation of a test result should always take into account all clinical and laboratory findings.

### SYMBOLS USED

	In vitro diagnostic medical device
	Manufacturer
	Catalogue number
	Sufficient for ... determinations
	Batch code
	Use by
	Temperature limitation
	Consult instructions for use
	Keep away from sunlight
	Do not reuse
	Date of manufacture
	CE marked according to 98/79/EC
	Electronic Instruction For Use: version

### PRINCIPLE OF THE TEST

Fc fragments of highly purified human Immunoglobulin G are bound to microwells.

The Alegria<sup>®</sup> assay features barcoded 8-well-microstrips, called Alegria<sup>®</sup> Test Strips. Each strip is designed for a single determination of one patient sample. The Alegria<sup>®</sup> Test Strip holds a complete set of reagents. Included are enzyme conjugate, enzyme substrate, sample buffer and a test specific control. Furthermore each strip has two antigen-coated wells which serve as reaction wells for one control and one patient sample.

The determination is based on an indirect enzyme linked immune reaction with the following steps: Antibodies present in positive samples bind to the antigen coated on the surface of the two reaction wells forming an antibody antigen complex. After incubation, a first washing step removes unbound and unspecific bound molecules. Subsequently added enzyme conjugate binds to the immobilized antibody-antigen complex. After incubation, a second washing step removes unbound enzyme conjugate. Addition of enzyme substrate solution results in hydrolysis and color development during incubation. The intensity of the blue color correlates with the concentration of the antibody-antigen-complex and can be measured photometrically at 650 nm.

The Alegria<sup>®</sup> Test Strip is based on the proprietary SMC<sup>®</sup>-Technology (Sensotronic Memorized Calibration): information about the assay, analysis and evaluation, and the lot-specific expiry date is contained on the barcode printed on each Alegria<sup>®</sup> Test Strip.

The Alegria<sup>®</sup> Test Strip can be used with the diagnostic instrument Alegria<sup>®</sup> - a fully automated Random Access Analyser. By means of SMC<sup>®</sup>-Technology data encoded on the barcode are transferred from the Alegria<sup>®</sup> Test Strip to the instrument and the assay is automatically processed and evaluated. The instrument reads the date of expiry and rejects further processing if the Alegria<sup>®</sup> Test Strip is out of date.

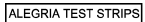



### WARNINGS AND PRECAUTIONS

- 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).
- System fluid contains acid, classification is non-hazardous. Avoid contact with skin.
- Control, sample buffer and wash buffer contain sodium azide 0.09% as preservative. This concentration is classified as non-hazardous
- Enzyme conjugate, control and sample buffer contain 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 Alegria<sup>®</sup> strips 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 controls and/or pooled sera.

## CONTENTS OF THE KIT

	24	ORG 222S-24	Sufficient for 24 determinations
	1x 20 ml	Wash Buffer, containing Tris, detergent, preservative sodium azide 0.09%; 50 x conc.	
	1x 2.5 ml	System Fluid, contains acid; 1000 x concentrate	
	1	Certificate of Analysis	

## 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 Alegria® Test Strips sealed and desiccated in the clip bag provided.
- Shelf life of the unopened test kit is 15 months from day of production.
- Unopened reagents are stable until expiration of the kit. See labels for individual batch.
- Diluted Wash Buffer and System Fluid are stable for at least 30 days when stored at 2-8°C.
- Once transferred to the reagent container we recommend consumption on the same day.

## MATERIALS REQUIRED

- Vortex mixer
- Pipettes for 10 µl
- Measuring cylinder for 1000 ml and 2500 ml
- Distilled or deionized water


## 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.

## PROCEDURAL NOTES

- Do not use kit components beyond their expiration dates.
- All materials must be at room temperature (20-28°C) prior to use.
- To avoid carryover or contamination, change the pipette tip between samples.

## PREPARATION OF REAGENTS

 Dilute the content of the Wash Buffer concentrate (50x) with distilled or deionized water to a final volume of 1000 ml prior to use. Transfer the diluted Wash Buffer into the instrument reagent container. If only one Alegria run is to be performed on one day we recommend transferring only 500 ml diluted Wash Buffer.

## SYSTEM FLUID

Dilute the content of the System Fluid concentrate (1000x) with distilled or deionized water to a final volume of 2500 ml prior to use. Transfer the diluted System Fluid into the instrument reagent container.

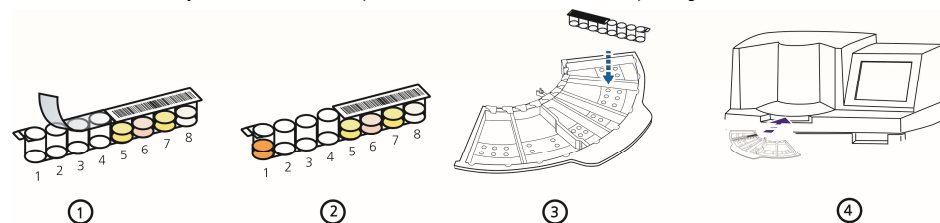
## ALEGRIA TEST STRIPS

Take the required number of Alegria® Test Strips out of the clip bag and let them reach room temperature (20-28°C). Do not remove foil covering the empty wells until you are ready to start the assay.

## TEST PROCEDURE

Alegria® Test Strips with SMC® technology are used with the diagnostic instrument Alegria®. Detailed information about operating the instrument can be taken from the Instrument User Manual.

- (1) Remove the foil from the empty wells 1 to 4 of the Alegria® Test Strip.  
**Do not remove foil with printed barcode, covering wells 5 to 8.**
- (2) Pipette 10 µl undiluted sample at the bottom of well 1.
- (3) Insert the strip into the SysTray.
- (4) Place loaded SysTrays into the correct position in the Alegria® instrument and start run. All further steps will be done automatically. The test run is completed when the instrument starts printing the results.



## CALIBRATION

This assay system is calibrated in relative arbitrary units. Calibration is related to 1st British Standard Preparation 64/2 for Rheumatoid Factor.

## CALCULATION OF RESULTS

By means of SMC® Technology (Sensotronic Memorized Calibration), all test data are transferred to the system through individual barcodes on the Alegria® Test Strip. Calculation and interpretation of results will be performed automatically.

## PERFORMANCE CHARACTERISTICS

### Measuring range

The calculation range of this Alegria® assay is 0 - 500 U/ml

### Expected values

In a normal range study with samples from healthy blood donors the following ranges have been established with this Alegria® assay: Cut-off 25 U/ml

### Interpretation of results

Normal:	< 25 U/ml
Elevated:	≥ 25 U/ml

## 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.

## Linearity

Three patient samples containing high levels of specific antibody were serially diluted in sample buffer to demonstrate the dynamic range of the assay. Activity for each dilution was calculated by means of SMC® Technology.

Sample	Dilution	Observed	Expected	O/E
		U/ml	U/ml	[%]
1	1:100	245.4	245.4	100
	1:200	119.4	122.7	97
	1:400	57.8	61.4	94
	1:800	27.2	30.7	89
2	1:100	136.4	136.4	100
	1:200	65.2	68.2	96
	1:400	30.9	34.1	91
	1:800	15.2	17.1	89
3	1:100	429.8	429.8	100
	1:200	209.2	214.9	97
	1:400	102.8	107.5	96
	1:800	50.3	53.7	94

## Sensitivity

Functional sensitivity was determined to be: 1 U/ml

## 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 U/ml	% CV
1	20.2	5.2
2	212.3	5.5
3	289.1	5.1

Inter-Assay		
Sample	Mean U/ml	% CV
1	9.7	14.0
2	25.2	12.0
3	258.0	15.0

## 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, Heparine). However for practical reasons it is recommended that grossly hemolyzed or lipemic samples should be avoided.

## Study results

Study population	n	n pos	%
Rheumatoid arthritis	300	288	96.0
Normal human sera	169	18	10.7

		Clinical Diagnosis		
		Pos	Neg	
ORG 222S	Pos	288	18	469
Rheumatoid Factor Screen	Neg	12	151	
		300	169	

Sensitivity: 96.0 %  
 Specificity: 89.3 %  
 Overall agreement: 93.6 %

## REFERENCES

- Arinbjarnarson S., Jonsson T., Steinsson K. et al. IgA rheumatoid factor correlates with changes in B and T lymphocyte subsets and disease manifestations in rheumatoid arthritis. *J. Rheumatol.* 1997; 24: 269-274.
- Borretzen M., Mellbye O. J., Thompson K. M., Natvig J. B. Rheumatoid Factors. In: Peter J. B., Shoenfeld Y. eds. *Autoantibodies*. 1 ed. Amsterdam: Elsevier, 1996: 706-715.
- Brown P. B., Nardella F. A., Mannik M. Human complement activation by self-associated IgG rheumatoid factors. *Arthritis Rheum.* 1982; 25: 1101-1107.
- Ernst E., Espersen G. T., Andersen M. V. Grunnet N. RF-classes (IgM, IgG, IgA) in a group of highly active RA-patients in relation to disease activity and treatment. *Scand. J. Rheumatol. Suppl.* 1988; 75: 250-255.
- Espersen G. T. Ernst E. Vestergaard M. Grunnet N. ELISA estimations of rheumatoid factor IgM, IgA, and IgG in sera from RA patients with high disease activity. DTT treatment studies. *Scand. J. Rheumatol. Suppl.* 1988; 75: 40-45.
- Houssien D. A., Jonsson T., Davies E., Scott D. L. Clinical significance of IgA rheumatoid factor subclasses in rheumatoid arthritis. *J. Rheumatol.* 1997; 24: 2119-2122.
- Jonsson T., Arinbjarnarson S., Thorsteinsson J. et al. Raised IgA rheumatoid factor (RF) but not IgM RF or IgG RF is associated with extra-articular manifestations in rheumatoid arthritis. *Scand. J. Rheumatol.* 1995;24: 372-375.
- Kleveland G., Egeland T., Lea T. Quantitation of rheumatoid factors (RF) of IgM, IgA and IgG isotypes by a simple and sensitive ELISA. Discrimination between false and true IgG-RF. *Scand. J. Rheumatol. Suppl.* 1988; 75: 15-24.
- Mogk M., Weise I., Welcker M., Oppermann M., Helmke K. Bedeutung der Rheu-mafaktor-Immunglobulinklassen IgG, IgA und IgM in der Diagnostik rheumatologischer und immunologischer Erkrankungen. *Clin. Lab.* 1995; 41: 885-891.
- Paimela L., Palosuo T., Leirisalo-Repo M., Helve T., Aho K. Prognostic value of quantitative measurement of rheumatoid factor in early rheumatoid arthritis. *Br. J. Rheumatol.* 1995; 34: 1146-1150.
- Pope R. M. Rheumatoid arthritis: pathogenesis and early recognition. *Am. J. Med.* 1996; 100: 3S-9S.
- Scutellari P. N., Orzincolo C. Rheumatoid arthritis: sequences. *Eur. J. Radiol.* 1998; 27 Suppl. 1: S31-S38
- Swedler W., Wallman J., Froelich C. J., Teodorescu M. Routine measurement of IgM, IgG, and IgA rheumatoid factors: high sensitivity, specificity, and predictive value for rheumatoid arthritis. *J. Rheumatol.* 1997; 24: 1037-1044.
- Winska W. H., Thompson K., Young A., Corbett M., Shipley M., Hay F. IgA and IgM rheumatoid factors as markers of later erosive changes in rheumatoid arthritis (RA). *Scand. J. Rheumatol. Suppl.* 1988; 75: 238-243.

Notice to the user (European Union):

Any serious incident that has occurred in relation to the device shall be reported to the manufacturer and the competent authority of the EU Member State in which the user and/or the patient is established .

