

ASCA IgG ELISA

Catalog Number:
ASG31-K01

Enzyme immunoassay for the determination
of IgG antibodies to *Saccharomyces cerevisiae*
in human serum



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v. 1.0*

The Eagle Biosciences ASCA IgG ELISA Assay Kit is used for the qualitative and quantitative determination of IgG antibodies to *Saccharomyces cerevisiae* in human serum.

Non-specific inflammatory bowel diseases including Crohn's disease (Enteritis regionalis) and ulcerative colitis (UC) are characterized by unknown etiology as well as chronic-remitting inflammatory processes of the intestine. Whereas the inflammation of ulcerative colitis is restricted to the mucosa and submucosa of colon and rectum, Crohn's disease (CD) shows a wide spread inflammation of the gastrointestinal tract with granuloma formation.

The risk developing one of these diseases is strongly influenced by immunologic, genetic, infectious and environmental factors.

The differential diagnosis of inflammatory bowel diseases to chronic diarrhea, recurrent abdominal dolor, infectious colitis, anorexia as well as the differentiation of CD to ulcerative colitis is still a high challenge.

The determination of IgA and IgG antibodies to *Saccharomyces cerevisiae* (baker's yeast) has been described as one important serological marker for the differential diagnosis of Crohn's disease recently. Up to 70 % of patients with CD show antibody levels to *Saccharomyces cerevisiae*. Although the cause for their occurrence has been unclear, antibodies to *Saccharomyces cerevisiae* (ASCA) are strongly associated with inflammatory processes of the intestine.

In combination with the detection of autoantibodies to atypical anti-neutrophil cytoplasmic antigens (aANCA) which are mainly found in patients with ulcerative colitis, ASCA are a valid parameter for the differentiation of Crohn's disease and ulcerative colitis.

Eagle Biosciences offers two innovative serological markers for inflammatory bowel diseases **ASCA IgA** and **ASCA IgG**. Both assays employ the same assay scheme and predilution maximizing laboratory efficiency.

Conrad K, Schmechta H, Klafki A, Lobeck G, Uhlig HH, Gerdi S, Henker J: Serological differentiation of inflammatory bowel diseases. *Eur J Gastrol & Hepatol.* 2002 14:129-135

Vermeire S: Serological Diagnosis in IBD. *IBDM* 2002 3:82-89

PRINCIPLE OF THE TEST

The Eagle Biosciences ASCA IgG ELISA Assay Kit is an enzyme immunoassay for the qualitative and quantitative determination of IgG antibodies to *Saccharomyces cerevisiae* in human serum.

Autoantibodies of the diluted patient samples, calibrators, and the control react with mannan (cell surface component of baker's yeast) immobilized on the solid phase of a microtiter plate. ASCA IgG guarantees the specific binding of anti-*Saccharomyces cerevisiae* IgG antibodies of the specimen under investigation by employing purified mannan of *Saccharomyces cerevisiae* for coating. Following an incubation period of 60 min at room temperature, 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 standard curve is established by plotting the antibody concentrations of the calibrators (x-axis) and their corresponding OD values (y-axis) measured. The concentration of antibodies of the specimen is directly read off the standard curve. Evaluating the test by a semi-quantitative method is also possible.

PATIENT SAMPLES

Specimen collection and storage

Blood is taken by venipuncture. Serum is separated after clotting by centrifugation. Lipaemic, hemolytic and contaminated samples should not be used.

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 serum samples gently in order to ensure homogeneity.

Note: Patient samples have to be diluted 1 + 100 (v/v), e.g. 10 µl sample + 1.0 ml sample diluent (C), prior to assay.

TEST COMPONENTS FOR 96 DETERMINATIONS

A Ag 96	Microtiter plate 12 breakable strips per 8 wells (total 96 individual wells) coated with mannan (<i>Saccharomyces cerevisiae</i>)	1 vacuum sealed with desiccant; 2 foils
B BUF WASH 10x	Concentrated wash buffer sufficient for 1000 ml solution each	100 ml concentrate capped white
C DIL	Sample diluent	100 ml ready for use capped black
D CONJ	Conjugate containing anti-human-IgG - (sheep) coupled with horse radish peroxidase	15 ml ready for use capped red
E SOLN TMB	Substrate 3,3',5,5'-tetramethylbenzidine in citrate buffer containing hydrogen peroxide	15 ml ready for use capped blue
F H2SO4 0.25M	Stop solution 0.25 M sulfuric acid	15 ml ready for use capped yellow
0 - 4 CAL	Calibrators (diluted serum) conc.: 1, 10, 30, 100, 300 U/ml	1 ml each ready for use capped white
P CONTROL	Positive control (diluted serum) conc.: see leaflet enclosed	1 ml ready for use capped red +
N CONTROL	Negative control (diluted serum) conc.: see leaflet enclosed	1 ml ready for use capped green -

Materials required in addition

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

Size and storage

The Eagle Biosciences ASCA IgG ELISA Assay Kit 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 ASCA IgG 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 re-sealed.

Prepare a sufficient amount of wash solution by diluting the concentrated wash buffer 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 up to 30 days at 2 - 8 °C.

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

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 μ l serum + 1.0 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 μ l calibrators 1 – 4 (CAL 0 optionally, quantitative) or
100 μ l calibrator 1 (semi-quantitative)
100 μ l control P (N optional)
100 μ l 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 μ l** wash solution (made of B).
5. Add **100 μ l** 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 μ l** wash solution (made of B).
8. Add **100 μ l** of substrate (E) to each well.
9. Cover plate, incubate **15 min protected from light** at room temperature (18...25°C).
10. Add **100 μ l** 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

ASCA IgG allows both the quantitative and semi-quantitative evaluation of the results.

Quantitative evaluation

We recommend log / lin processing for best results.

The standard curve is established by plotting the mean OD-values of the calibrators 1 - 4 (CAL 0 optionally) on the ordinate, y-axis, (lin. scale) versus their respective ASCA IgG-concentrations on the abscissa, x-axis, (log. scale).

Anti-Saccharomyces cerevisiae concentrations of the unknown samples are directly read off in U/ml against the respective OD values.

Using the recommended dilution of 1 + 100 (v/v) for patient's sera, no correction factor is necessary, as all other components of the kit are supplied accordingly.

Semi-quantitative evaluation

Results can be calculated semi-quantitatively calculating the binding index BI (ratio) between the optical density of an unknown sample and the optical density of calibrator 1 (**10 U/ml**) multiplied by a **factor 2**.

$$BI = OD_{\text{sample}} / (OD_{\text{calibrator 1 (10 U/ml)}} \times 2)$$

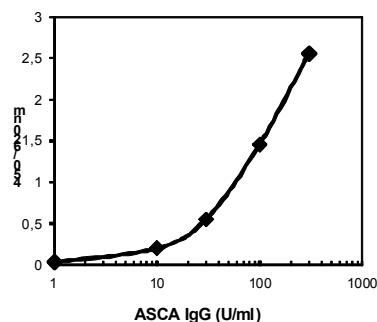
Both evaluation variants of ASCA IgG may be achieved also with computer assisted analysis software intergrated in the photometers.

Example of typical assay results (quantitative)

well	OD (a)	OD (b)	OD (mean)	U/ml
Calibrator 0	0.038	0.033	0.036	1
Calibrator 1	0.207	0.200	0.204	10
Calibrator 2	0.571	0.539	0.555	30
Calibrator 3	1.451	1.462	1.457	100
Calibrator 4	2.526	2.594	2.560	300
Patient 1	1.192	1.204	1.198	70

The above mentioned calibrator concentrations are only an example for a typical standard curve. They can change from lot to lot.

TYPICAL STANDARD CURVE (example)



Specimens with an OD > calibrator 4 should be re-tested in a greater sample dilution. The results have to be multiplied with the chosen dilution factor.

Test validity

The test run is valid if:

- the mean OD of the calibrator 1 is ≤ 0.5
- the mean OD of the calibrator 4 is ≥ 1.2

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.

REFERENCE VALUES

ASCA IgG	U/ml	BI
positive	≥ 20	≥ 1.0
negative	< 20	< 1.0

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

Limitations of Method

Healthy individuals should be tested negative by the ASCA IgG. However, ASCA IgG antibody 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.

CHARACTERISTIC ASSAY DATA

Calibration

Due to the lack of an international reference material the ASCA IgG is calibrated in arbitrary units (U/ml).

Diagnostic sensitivity and specificity

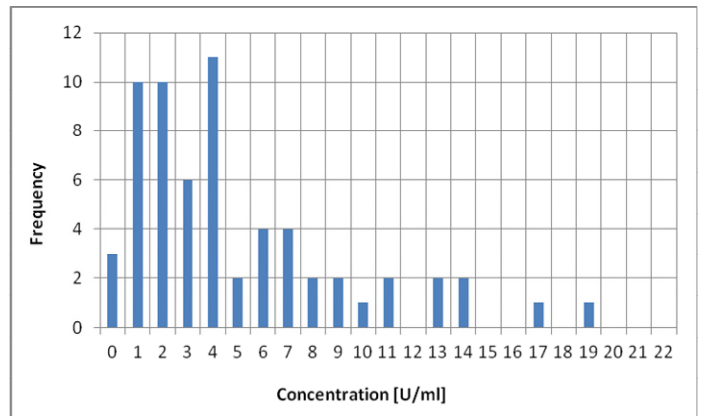
The diagnostic sensitivity and specificity of ASCA IgA for the differential diagnosis of chronic inflammatory bowel diseases have been determined by testing 116 patients with Crohn's disease and 75 patients with ulcerative colitis:

Diagnostic sensitivity: 49%

Diagnostic specificity: 92%

Frequency distribution

63 normal sera (without clinical symptoms) were tested in ASCA IgA. All sera were found with concentrations below the cut-off (20 U/ml). This corresponds to a specificity of 100 %.



Precision

Intraassay Variance (n=8)		Interassay Variance (n=3 x16)	
mean (IU/ml)	CV %	mean (IU/ml)	CV %
164	6.7	189	7.6
57	3.1	60	4.7
18	4.1	19	6.5

ASCA IgG ELISA Assay Kit

ASSAY SCHEME

Dilute patients sample★ 10 µl serum + 1.0 ml sample diluent (C)

★This dilution can also be used in the ASCA IgA ELISA Assay Kit (ASA31-K01)

1	Bring all ready for use reagents to room temperature (18...25°C) before use.				
		calibrators	controls	sera	
2	Pipette	Calibrators (0 - 4) or Calibrator 1 Controls (P, N) prediluted 1 + 100 patient sera	100 µl	100 µl	100 µl
3	Incubate	60 minutes at room temperature (18...25°C)			
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 (18...25°C)			
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 (18...25°C)			
10	Pipette stop solution (F)	100 µl	100 µl	100 µl	
11	Measure 450 nm versus 620 (690) nm				

SAFETY PRECAUTIONS

- **This ASCA IgG ELISA Assay Kit is for research use only.** Follow the working instructions carefully. 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.
- Avoid time shift during pipetting of reagents.
- All reagents should be kept at 2 - 8 °C before use in the original shipping container.
- Some of the reagents contain small amounts of Neolone M10 (1.0 % v/v) as preservative. 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 HIV as well as for 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.

Warranty Information

Eagle Biosciences, Inc. warrants its Product(s) to operate or perform substantially in conformance with its specifications, as set forth in the accompanying package insert. This warranty is expressly limited to the refund of the price of any defective Product or the replacement of any defective Product with new Product. This warranty applies only when the Buyer gives written notice to the Eagle Biosciences within the expiration period of the Product(s) by the Buyer. In addition, Eagle Biosciences has no obligation to replace Product(s) as result of a) Buyer negligence, fault, or misuse, b) improper use, c) improper storage and handling, d) intentional damage, or e) event of force majeure, acts of God, or accident.

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For further information about this kit, its application or the procedures in this kit, please contact the Technical Service Team at Eagle Biosciences, Inc. at info@eaglebio.com or at 866-411-8023.