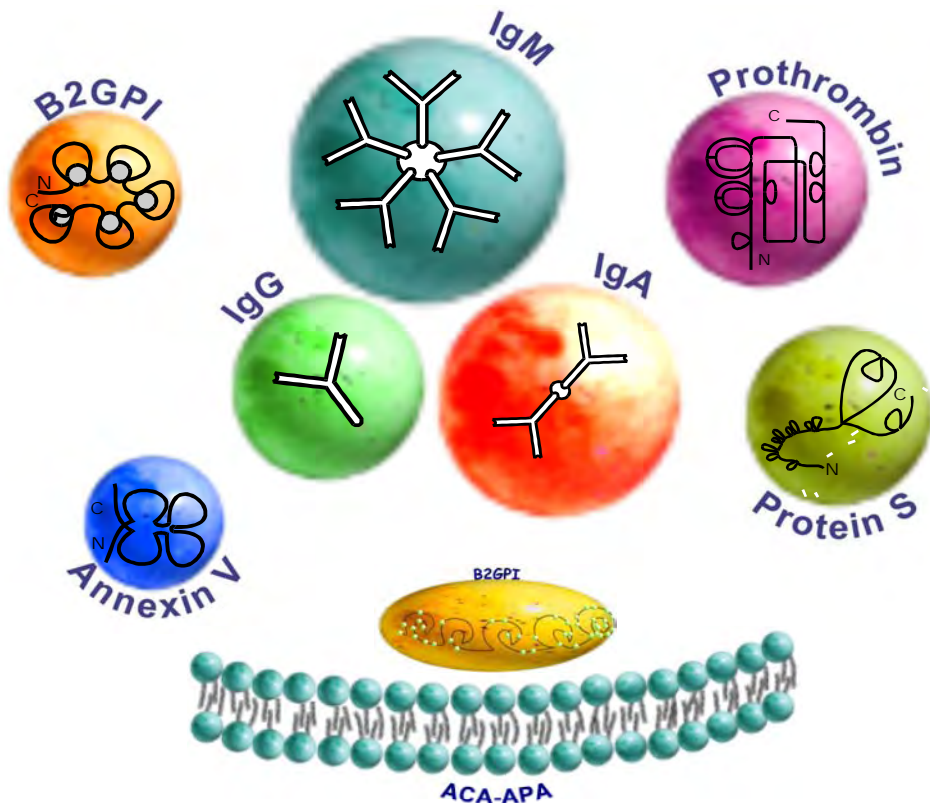




# NEW ASSAYS FOR ANTI -CARDIOLIPIN/ANTI -PHOSPHOLIPID ANTIBODIES (ACA-APA)

The updated solutions for your laboratory testing issues



The ZYMUTEST line offers optimized assays with improved performances

- Series to series
- Lot to lot homogeneity of results
- Reproducibility

- Reliability
- Well defined target antigens
- Low background

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# OPTIMIZED TESTING OF ANTI PHOSPHOLIPID ANTIBODIES AND ANTIBODIES TO PHOSPHOLIPID COFACTORS

Use now assays offering a high discriminating efficacy between samples with or without antibodies: measure all, and only the "true", phospholipid dependent antibodies.

## ACA-APA kits (IgG, IgM or IgA)

### Capture antigen

- Actually ACA-APA are targeted to  $\beta$ 2GPI-anionic phospholipid complexes, exposing the cryptic epitopes of  $\beta$ 2GPI. Whether the anionic phospholipid used (PS, cardiolipin, phosphatidic acid, etc...), antibodies bind to complexes of anionic phospholipids and  $\beta$ 2GPI. The different assay reactivities mainly objectivate the capacity of the anionic phospholipid used to bind  $\beta$ 2GPI, empirically supplied by the diluent (animal serum) or by the tested specimen itself.
- ZYMUTEST ACA/APA kits use a synthetic anionic phospholipid (cardiolipin), non oxidized, complexed with an optimized concentration of human  $\beta$ 2GPI, as capture antigen.

### Clinical applications

- Antiphospholipid syndrome (APS), thrombotic diseases, recurrent abortions.
- Follow-up of pathogenicity, which is associated with the time of exposure to antibodies, the IgG isotype, ACA-APA concentration and affinity.
- Follow-up of patients with APS.

### Assay characteristics

- High sensitive and specific assays, measuring specifically the  $\beta$ 2GPI dependent Anti-Cardiolipin/Anti-Phospholipid Antibodies, which allows obtaining a higher clinical significance.

## Anti-Protein S / Anti-Protein C Anti-Protein Z Assays (IgG or IgM)

### Characteristics

- Antibodies targeted to phospholipid dependent proteins.
- Protein S: MW: 75,000 Da - 25 mg/L in plasma.
- Protein C: MW: 62,000 Da - 4 mg/L in plasma.
- Protein Z: MW: 62,000 Da - 2.5 mg/L in plasma.

### Clinical applications

- Complementary exploration of atypical APS, or unexplained thrombosis: miscarriages; autoimmune disorders.
- Anti-Protein S antibodies have been observed in some cases of chicken pox, associated with thrombotic disorders.

## ZYMUTEST line uses well characterised auto-antigens for antibody capture



## Anti-Prothrombin assays (IgG or IgM)

### Characteristics

- Antibodies targeted to human prothrombin.
- Human Prothrombin (or Factor II) is a 72,000 Da vitamin K dependent protein, which is part of the prothrombinase complex with FVa, FXa and phosphatidyl serine, in presence of calcium (Ca<sup>2+</sup>).
- The anionic phospholipid binding site is located on the N-terminal part of Prothrombin (Gla domain).

### Clinical applications

- Complementary exploration of APS, miscarriages and unexplained thrombotic events.
- Anti-Prothrombin antibodies may be observed following some viral infections of childhood, frequently associated with LA.

Assays designed using highly functional, and active, non denatured, capture antigen (human  $\beta$ 2GPI) for a complete and ultra-specific testing of the "true" anti- $\beta$ 2GPI auto-antibodies.

## Anti- $\beta$ 2GPI assays (IgG, IgM or IgA)

### $\beta$ 2GPI characteristics

- 326 aminoacid polypeptide synthesized in liver.
- Highly glycosylated.
- Molecular weight: 50 kd.
- 5 "sushi" domains, high inter-species cross reactivity (especially for the phospholipid bound  $\beta$ 2GPI or the "coated" protein).
- Plasmatic concentration of 200  $\pm$  50 mg/L.

### Properties

- High binding affinity for negatively charged molecules : anionic phospholipids, DNA, Heparin.

### Clinical applications

- In association with ACA-APA evaluation, anti- $\beta$ 2GPI antibodies could be a marker of advanced disease and pathogenicity (worsening with elevated concentrations).
- Rare isolated anti- $\beta$ 2GPI antibody positive patients, negative for ACA-APA, have been reported.
- Testing anti- $\beta$ 2GPI antibodies, whilst less sensitive than ACA-APA, could be more specific for their association with the clinical manifestations of APS.

## Anti-Annexin V assays (IgG or IgM)

### Characteristics

- Antibodies to Annexin V.
- Annexin V is a 35,000 Da, Ca<sup>2+</sup> dependent protein present at low concentration in plasma (< 5 ng/mL).
- Present in many tissues (endothelial cells, placenta, ...).
- Present in platelets (5.9 10<sup>16</sup> g/cell) and, at higher concentrations, in red blood cells and leukocytes.

### In-vivo functions of Annexin V

- Binds to anionic phospholipids via Ca<sup>2+</sup>.
- Inhibits blood coagulation and phospholipase A<sub>2</sub>.
- Regulates exocytosis and interacts with cytoskeletal proteins.
- Inhibits pro-coagulant and pro-inflammatory activities of dying cells during apoptosis.

### Clinical applications

- Atypical APS, miscarriages, infections.
- The clinical associations or pathological risk of anti-Annexin V antibodies are still discussed.

## Characteristics:

- Use of precoated auto-antigens, highly purified, prepared using non denaturing fractionation methods, and preserving the native protein structure and affinity for phospholipids (high specificity, high sensitivity, high reactivity with autoantibodies, improved clinical significance).
- Use of goat serum for saturation of the precoated plate, and for sample diluent, and use of a second antibody obtained in goats, which allows obtaining a low background and a high specificity.
- Reproducibility and reliability of assays, from run to run, and from lot to lot, warranted by the quality control system. Each lot is tested with a panel of normal and pathological samples. An internal reference calibrator is used.
- Disposable assays.
- Total assay time from 1 to 2 hours (according to the assay and the protocol used).

## Each kit contains:

- 1 (12 strips of 8 wells) micro ELI SA plate.
- 3 vials of calibrator standardised with international references, when available (lyophilised).
- 3 vials of negative control plasmas (lyophilised).
- 3 vials of immunoconjugate (stability > 4 weeks after reconstitution) (lyophilised).
- 1 vial of 20 fold concentrated wash solution.
- 1 vial of sample diluent (ready to use).
- 1 vial of conjugate diluent (ready to use).
- 1 vial of peroxidase substrate 3,3',5,5' Tetra-Methyl-Benzidine (TMB) (ready to use).
- 1 vial of stop solution (0.45M sulfuric acid) (ready to use).

And various additional and specific reagents or control vials, according to the assay concerned.

### Available kits for Autoimmunity

ZYMUTEST anti-Annexin V, IgG .....	ARK005A	ZYMUTEST anti-Protein S, IgM .....	ARK020B
ZYMUTEST anti-Annexin V, IgM .....	ARK005B	ZYMUTEST anti-Protein Z, IgA .....	ARK025A
ZYMUTEST anti-Prothrombin, IgG .....	ARK007A	ZYMUTEST anti-Protein Z, IgM .....	ARK025B
ZYMUTEST anti-Prothrombin, IgM .....	ARK007B	ZYMUTEST anti-Protein C, IgG .....	ARK026A
ZYMUTEST anti-B2GPI, IgG .....	ARK014A	ZYMUTEST anti-Protein C, IgM .....	ARK026B
ZYMUTEST anti-B2GPI, IgM .....	ARK014B	ZYMUTEST ACA-APA, IgG .....	ARK029A
ZYMUTEST anti-B2GPI, IgA .....	ARK014C	ZYMUTEST ACA-APA, IgM .....	ARK029B
ZYMUTEST anti-Protein S, IgG .....	ARK020A	ZYMUTEST ACA-APA, IgA .....	ARK029C

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