

### INTENDED USE

This human  $\alpha$ 2-antiplasmin assay is for the quantitative determination of total  $\alpha$ 2-antiplasmin in human plasma.

**For research use only.**

### BACKGROUND

$\alpha$ 2-antiplasmin is the major circulating inhibitor of plasmin. It plays a role in the regulation of intravascular fibrinolysis [1,2]. Decreased levels of  $\alpha$ 2-antiplasmin may play an important role in the increased capacity of the fibrinolytic function and may be beneficial in the treatment of thrombotic diseases, acute pulmonary embolism, and hepatic repair [3,4,6,7].

### ASSAY PRINCIPLE

Total human  $\alpha$ 2-antiplasmin will bind to the affinity purified capture antibody coated on the microtiter plate. Complexed and free  $\alpha$ 2-antiplasmin will react with the antibody on the plate. After appropriate washing steps, polyclonal anti-human  $\alpha$ 2-antiplasmin primary antibody binds to the captured protein. Excess primary antibody is washed away and bound antibody, which is proportional to the total  $\alpha$ 2-antiplasmin present in the samples, is reacted with horseradish peroxidase conjugated streptavidin. Following an additional washing step, TMB substrate is used for color development at 450nm. A standard calibration curve is prepared along with the samples to be measured using dilutions of human  $\alpha$ 2-antiplasmin. Color development is proportional to the concentration of  $\alpha$ 2-antiplasmin in the samples.

### REAGENTS PROVIDED

- **96-well antibody coated microtiter strip plate** (removable wells 8x12) containing anti-human  $\alpha$ 2-antiplasmin antibody, blocked and dried.
- **10X Wash buffer:** 1 bottle of 50ml
- **Human  $\alpha$ 2-antiplasmin standard:** 1 vial lyophilized standard
- **Anti-human  $\alpha$ 2-antiplasmin primary antibody:** 1 vial lyophilized polyclonal antibody
- **Horseradish peroxidase-conjugated streptavidin:** 1 vial concentrated HRP labeled streptavidin
- **TMB substrate solution:** 1 bottle of 10ml solution

### STORAGE AND STABILITY

Store all kit components at 4°C upon arrival. Return any unused microplate strips to the plate pouch with desiccant. Reconstituted standard and primary may be stored at -80°C for later use. Do not freeze-thaw the standard and primary antibody more than once. Store all other unused kit components at 4°C. This kit should not be used beyond the expiration date.

### OTHER REAGENTS AND SUPPLIES REQUIRED

- Microtiter plate shaker capable of 300 rpm uniform horizontally circular movement
- Manifold dispenser/aspirator or automated microplate washer
- Microplate reader capable of measuring absorbance at 450 nm
- Pipettes and Pipette tips
- Deionized or distilled water
- Polypropylene tubes for dilution of standard
- Paper towels or laboratory wipes
- 1N H<sub>2</sub>SO<sub>4</sub> or 1N HCl
- Bovine Serum Albumin Fraction V (BSA)
- Tris(hydroxymethyl)aminomethane (Tris)
- Sodium Chloride (NaCl)

## PRECAUTIONS

- FOR LABORATORY RESEARCH USE ONLY. NOT FOR DIAGNOSTIC USE.
- Do not mix any reagents or components of this kit with any reagents or components of any other kit. This kit is designed to work properly as provided.
- Always pour peroxidase substrate out of the bottle into a clean test tube. Do not pipette out of the bottle as contamination could result.
- Keep plate covered except when adding reagents, washing, or reading.
- DO NOT pipette reagents by mouth and avoid contact of reagents and specimens with skin.
- DO NOT smoke, drink, or eat in areas where specimens or reagents are being handled.

## PREPARATION OF REAGENTS

- **TBS buffer:** 0.1M Tris, 0.15M NaCl, pH 7.4
- **Blocking buffer (BB):** 3% BSA (w/v) in TBS
- **1X Wash buffer:** Dilute 50ml of 10X wash buffer concentrate with 450ml of deionized water

## SAMPLE COLLECTION

Collect plasma using EDTA or citrate as an anticoagulant. Centrifuge for 15 minutes at 1000xg within 30 minutes of collection. Assay immediately or aliquot and store at  $\leq -20^{\circ}\text{C}$ . Avoid repeated freeze-thaw cycles.

## ASSAY PROCEDURE

Perform assay at room temperature. Vigorously shake plate (300rpm) at each step of the assay.

## Preparation of Standard

**Reconstitute standard according to the C of A.** Agitate gently to completely dissolve contents.

Dilution table for preparation of human  $\alpha 2$ -antiplasmin standard:

$\alpha 2$ -antiplasmin concentration (ng/ml)	Dilutions
100	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (from vial)
50	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (100ng/ml)
25	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (50ng/ml)
10	600 $\mu\text{l}$ (BB) + 400 $\mu\text{l}$ (25ng/ml)
5	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (10ng/ml)
2.5	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (5ng/ml)
1	600 $\mu\text{l}$ (BB) + 400 $\mu\text{l}$ (2.5ng/ml)
0.5	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (1ng/ml)
0.25	500 $\mu\text{l}$ (BB) + 500 $\mu\text{l}$ (0.5ng/ml)
0.1	600 $\mu\text{l}$ (BB) + 400 $\mu\text{l}$ (0.25ng/ml)
0	500 $\mu\text{l}$ (BB) Zero point to determine background

**NOTE: DILUTIONS FOR THE STANDARD CURVE AND ZERO STANDARD MUST BE MADE AND APPLIED TO THE PLATE IMMEDIATELY.**

## Standard and Unknown Addition

Remove microtiter plate from bag and add 100 $\mu\text{l}$   $\alpha 2$ -antiplasmin standards (in duplicate) and unknowns to wells. Carefully record position of standards and unknowns. Shake plate at 300rpm for 30 minutes. Wash wells three times with 300 $\mu\text{l}$  wash buffer. Remove excess wash by gently tapping plate on paper towel or kimwipe.

NOTE: The assay measures  $\alpha 2$ -antiplasmin antigen in the 0.1-100 ng/ml range. If the unknown is thought to have high  $\alpha 2$ -antiplasmin levels, dilutions may be made in blocking buffer. A 1:50,000 dilution for normal human plasma is suggested for best results.

### **Primary Antibody Addition**

Reconstitute primary antibody by adding 10ml of blocking buffer directly to the vial and agitate gently to completely dissolve contents. Add 100 $\mu$ l to all wells. Shake plate at 300rpm for 30 minutes. Wash wells three times with 300 $\mu$ l wash buffer. Remove excess wash by gently tapping plate on paper towel or kimwipe.

### **Streptavidin-HRP Addition**

Briefly centrifuge vial before opening. **See C of A for lot specific dilution instructions.** Add 100 $\mu$ l of your dilution to all wells. Shake plate at 300rpm for 30 minutes. Wash wells three times with 300 $\mu$ l wash buffer. Remove excess wash by gently tapping plate on paper towel or kimwipe.

### **Substrate Incubation**

Add 100 $\mu$ l TMB substrate to all wells and shake plate for 2-5 minutes. Substrate will change from colorless to different strengths of blue. Quench reaction by adding 50 $\mu$ l of 1N H<sub>2</sub>SO<sub>4</sub> or HCl stop solution to all wells when samples are visually in the same range as the standards. Add stop solution to wells in the same order as substrate upon which color will change from blue to yellow. Mix thoroughly by gently shaking the plate.

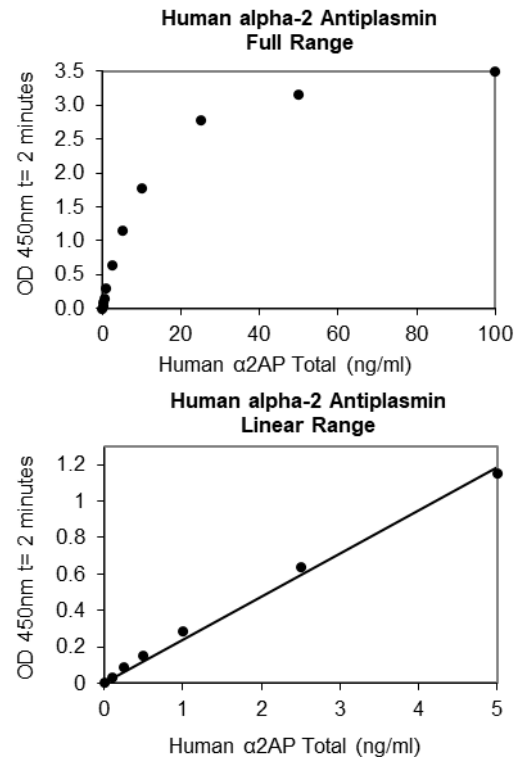
### **Measurement**

Set the absorbance at 450nm in a microtiter plate spectrophotometer. Measure the absorbance in all wells at 450nm. Subtract zero point from all standards and unknowns to determine corrected absorbance ( $A_{450}$ ).

### **Calculation of Results**

Plot  $A_{450}$  against the amount of  $\alpha$ 2-antiplasmin in the standards. Fit a straight line through the linear points of the standard curve using a linear fit procedure if unknowns appear on the linear portion of the standard curve. Alternatively, create a standard curve by analyzing the data using a software program capable of generating a four-parameter logistic (4PL) curve fit. The amount of  $\alpha$ 2-antiplasmin in the unknowns can be determined from this curve. If samples have been diluted, the calculated concentration must be multiplied by the dilution factor.

A typical standard curve (EXAMPLE ONLY):



### **EXPECTED VALUES**

The normal human concentration of  $\alpha$ 2-antiplasmin is 70 $\mu$ g/ml or 1 $\mu$ M in plasma and 47.6  $\mu$ g/ml or 0.68 $\mu$ M in serum [8].

Abnormalities in  $\alpha$ 2-antiplasmin levels have been reported in the following conditions:

- Hemostatic Dysfunction: Low levels of  $\alpha$ 2-antiplasmin may result in hemostatic dysfunction [5].
- Thrombus Formation: Reduction of  $\alpha$ 2-antiplasmin may result in thrombus formation [9].

## PERFORMANCE CHARACTERISTICS

**Sensitivity:** The minimum detectable dose (MDD) was determined by adding two standard deviations to the mean optical density value of twenty zero standard replicates and calculating the corresponding concentration. **See C of A for lot specifications.**

**Intra-assay Precision:** These studies are currently in progress. Please contact us for more information.

**Inter-assay Precision:** These studies are currently in progress. Please contact us for more information.

**Recovery:** These studies are currently in progress. Please contact us for more information.

**Linearity:** These studies are currently in progress. Please contact us for more information.

**Specificity:** This assay recognizes total  $\alpha$ 2-antiplasmin. Pooled normal plasma from mouse, porcine, sheep, rabbit, rat, and canine were assayed, and no significant cross-reactivity was observed. Pooled normal serum from porcine and Armenian hamster was assayed and no significant cross-reactivity was observed. Pooled normal plasma from rhesus monkey and cyno monkey was assayed and significant cross-reactivity was observed.

**Sample Values:** Samples were evaluated for the presence of the antigen at varying dilutions.

Sample Type	Dilution	Mean ( $\mu$ g/mL)
Citrate Plasma	1:50,000	67.8

## DISCLAIMER

This information is believed to be correct but does not claim to be all-inclusive and should be used only as a guide. The supplier of this kit shall not be held liable for any damage resulting from handling of or contact with the above product.

## REFERENCES

1. Menoud PA, *et al.*: J Clin Invest. 1996, 97(11):2478-84.
2. Lijnen, HR: Front Biosci. 2001, 6:D239-47.
3. Butte AN, *et al.*: Circulation. 1997, 95(7):1886-91.
4. Dewerchin M, *et al.*: Thromb Haemost. 2001, 86(2):640-6.
5. Miles LA, *et al.*: Blood. 1982, 59(6):1246-51.
6. Matsuno H, *et al.*: J Thromb Haemost. 2003, 1(8):1734-9.
7. Okada K, *et al.*: J Hepatol. 2004, 40(1):110-6.
8. Cederholm-Williams, SA: J Clin Pathol. 1981, 34(9):979-981.
9. Takei M, *et al.*: J Thromb Thrombolysis. 2002, 14(3):205-11.

**Example of ELISA Plate Layout**

**96 Well Plate: 22 Standard wells, 74 Sample wells**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>A</b>	0	0.1 ng/ml	0.25 ng/ml	0.5 ng/ml	1 ng/ml	2.5 ng/ml	5 ng/ml	10 ng/ml	25 ng/ml	50 ng/ml	100 ng/ml	
<b>B</b>	0	0.1 ng/ml	0.25 ng/ml	0.5 ng/ml	1 ng/ml	2.5 ng/ml	5 ng/ml	10 ng/ml	25 ng/ml	50 ng/ml	100 ng/ml	
<b>C</b>												
<b>D</b>												
<b>E</b>												
<b>F</b>												
<b>G</b>												
<b>H</b>												