



# Rabbit retinol binding protein 4 (RBP-4) ELISA Kit

Catalog No. CSB-E07044Rb

(96 tests)

- This immunoassay kit allows for the in vitro rapid detection of rabbit RBP-4 concentrations in **serum, plasma** and other biological fluids.
- **Expiration date** six months from the date of manufacture
- **FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.**

## **INTRODUCTION**

Retinol binding protein 4, plasma, also known as RBP4, belongs to the lipocalin family and is the specific carrier for retinol (vitamin A alcohol) in the blood. It delivers retinol from the liver stores to the peripheral tissues. In plasma, the RBP-retinol complex interacts with transthyretin which prevents its loss by filtration through the kidney glomeruli. A deficiency of vitamin A blocks secretion of the binding protein posttranslationally and results in defective delivery and supply to the epidermal cells.

Retinol binding protein 4 has recently been described as an adipokine that contributes to insulin resistance in the AG4KO mouse model. It is secreted by adipocytes, and can act as a signal to other cells, when there is a decrease in plasma glucose concentration.

## **PRINCIPLE OF THE ASSAY**

This assay employs the competitive inhibition enzyme immunoassay technique. An antibody specific to RBP-4 has been pre-coated onto a microplate. Standards or samples are

added to the appropriate microtiter plate wells with HRP-conjugated RBP-4 and incubated. A competitive inhibition reaction is launched between RBP-4 (Standards or samples) and HRP-conjugated RBP-4 with the pre-coated antibody specific for RBP-4. The more amount of RBP-4 in samples, the less antibody bound by HRP-conjugated RBP-4. Then the substrate solutions are added to the wells, respectively. And the color develops in opposite to the amount of RBP-4 in the sample. The color development is stopped and the intensity of the color is measured.

## **DETECTION RANGE**

The standard curve concentrations used for the ELISA's were 40ng/ml, 11ng/ml, 2.7ng/ml, 1.1ng/ml, 0.55ng/ml.

## **SPECIFICITY**

This assay recognizes rabbit RBP-4. No significant cross-reactivity or interference was observed.

## **MATERIALS PROVIDED**

<b>Reagent</b>	<b>Quantity</b>
Assay plate	1
Standards (S1-S5)	5
HRP-conjugate	1 x 6 ml
Wash Buffer	1 x 15 ml (20×concentrate)
Substrate A	1 x 6 ml
Substrate B	1 x 6 ml
Stop Solution	1 x 6 ml

Standard	S1	S2	S3	S4	S5
Concentration (ng/ml)	0.55	1.1	2.7	11	40

## **STORAGE**

1. Unopened test kits should be stored at 2-8°C upon receipt and the microtiter plate should be kept in a sealed bag. The test kit may be used throughout the expiration date of the kit, provided it is stored as prescribed above. Refer to the package label for the expiration date.
2. Opened test plate should be stored at 2-8°C in the aluminum foil bag with desiccants to minimize exposure to damp air. The

kits will remain stable until the expiring date shown, provided it is stored as prescribed above.

3. A microtiter plate reader with a bandwidth of 10 nm or less and an optical density range of 0-3 OD or greater at 450nm wavelength is acceptable for use in absorbance measurement.

## **TECHNICAL HINTS**

1. Bring all reagents and plate to room temperature for at least 30 minutes before use. Unused wells need store at 2-8°C and avoid sunlight.
2. **Wash Buffer** If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Dilute 15 ml of Wash Buffer Concentrate into deionized or distilled water to prepare 300 ml of Wash Buffer.
3. To avoid cross-contamination, change pipette tips between additions of each standard level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.

4. When using an automated plate washer, adding a 30 second soak period following the addition of wash buffer, and/or rotating the plate 180 degrees between wash steps may improve assay precision.
5. Substrate Solution should remain colorless or light blue until added to the plate. Keep Substrate Solution protected from light. Substrate Solution should change from colorless or light blue to gradations of blue.
6. Stop Solution should be added to the plate in the same order as the Substrate Solution. The color developed in the wells will turn from blue to yellow upon addition of the Stop Solution. Wells that are green in color indicate that the Stop Solution has not mixed thoroughly with the Substrate Solution.

***Precaution: The Stop Solution provided with this kit is an acid solution.***

***Wear eye, hand, face, and clothing protection when using this material.***

## **OTHER SUPPLIES REQUIRED**

- Microplate reader capable of measuring absorbance at 450 nm, with the correction wavelength set at 540 nm or 570 nm.

- Pipettes and pipette tips.
- Deionized or distilled water.
- Squirt bottle, manifold dispenser, or automated microplate washer.
- An incubator which can provide stable incubation conditions up to  $37^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ .

## **SAMPLE COLLECTION AND STORAGE**

- **Serum** Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g. Remove serum and assay immediately or aliquot and store samples at  $-20^{\circ}\text{C}$ . Centrifuge the sample again after thawing before the assay. Avoid repeated freeze-thaw cycles.
- **Plasma** Collect plasma using citrate, EDTA, or heparin as an anticoagulant. Centrifuge for 15 minutes at 1000 x g within 30 minutes of collection. Assay immediately or aliquot and store samples at  $-20^{\circ}\text{C}$ . Centrifuge the sample again after thawing before the assay. Avoid repeated freeze-thaw cycles.

***Note: Grossly hemolyzed samples are not suitable for use in this assay.***

## ASSAY PROCEDURE

*Bring all reagents and samples to room temperature before use. It is recommended that all samples, standards, and controls be assayed in duplicate. All the reagents should be added directly to the liquid level in the well. The pipette should avoid contacting the inner wall of the well.*

1. Set a Blank well without any solution. Add 50µl of Standard or Sample per well. Standard need test in duplicate.
2. Add 50µl of **HRP-conjugate** to each well (not to Blank well), Mix well and then incubate for 1 hour at 37°C.
3. Fill each well with Wash Buffer (about 200µl), stay for 10 seconds and Spinning. Repeat the process for a total of three washes. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
4. Add 50µl of **Substrate A** and **Substrate B** to each well, mix well. Incubate for 15 minutes at 37°C. Keeping the plate away from drafts and other temperature fluctuations in the dark.
5. Add 50µl of **Stop Solution** to each well when the first four



wells containing the highest concentration of standards develop obvious blue color. If color change does not appear uniform, gently tap the plate to ensure thorough mixing.

6. Determine the optical density of each well within 10 minutes, using a microplate reader set to 450 nm.

## **CALCULATION OF RESULTS**

*Using the professional soft "Curve Exert 1.3" to make a standard curve is recommended, which can be downloaded from our web.*

Average the duplicate readings for each standard, Blank, and sample and subtract the optical density of Blank. Create a standard curve by reducing the data using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, construct a standard curve by plotting the mean absorbance for each standard on the y-axis against the concentration on the x-axis and draw a best fit curve through the points on the graph. The data may be linearized by plotting the log of the RBP-4 concentrations versus the log of the O.D. and the best fit line can be determined by regression analysis. This procedure will produce an adequate but less precise fit of the

data. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

## **LIMITATIONS OF THE PROCEDURE**

- The kit should not be used beyond the expiration date on the kit label.
- Do not mix or substitute reagents with those from other lots or sources.
- If samples generate values higher than the highest standard, dilute the samples with the appropriate Diluent and repeat the assay.
- Any variation in operator, pipetting technique, washing technique, incubation time or temperature, and kit age can cause variation in binding.
- This assay is designed to eliminate interference by soluble receptors, binding proteins, and other factors present in biological samples. Until all factors have been tested in the Quantikine Immunoassay, the possibility of interference cannot be excluded.