



E90217Ra 96 Tests

Enzyme-linked Immunosorbent Assay Kit

For Alpha 1 Microglobulin/Bikunin Precursor (a1M)

Organism: *Rattus norvegicus* (Rat)

Instruction manual

FOR IN VITRO USE AND RESEARCH USE ONLY

NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES

[INTENDED USE]

The kit is a competitive inhibition enzyme immunoassay technique for the in vitro quantitative measurement of a1M in rat serum, plasma, urine and other biological fluids.

[REAGENTS AND MATERIALS PROVIDED]

Reagents	Quantity	Reagents	Quantity
Pre-coated, ready to use 96-well strip plate	1	Plate sealer for 96 wells	4
Standard (liquid)	2	Standard Diluent	1×20mL
Detection Reagent A (green)	1×120μL	Assay Diluent A (2 × concentrate)	1×6mL
TMB Substrate	1×9mL	Stop Solution	1×6mL
Wash Buffer (30 × concentrate)	1×20mL	Instruction manual	1

[MATERIALS REQUIRED BUT NOT SUPPLIED]

1. Microplate reader with 450 ± 10 nm filter.
2. Precision single or multi-channel pipettes and pipette tips with disposable tips.
3. Eppendorf Tubes for diluting samples.
4. Deionized or distilled water.
5. Absorbent paper for blotting the microtiter plate.
6. Container for Wash Solution

[STORAGE OF THE KITS]

All the reagents should be kept according to the labels on vials. The **Standard**, **Detection Reagent A** and the **96-well strip plate** should be stored at -20°C upon being received. The unused strips should be kept in a sealed bag with the desiccant provided to minimize exposure to damp air. The test kit may be used throughout the expiration date of the kit (six months from the date of manufacture). Opened test kits will remain stable until the expiring date shown, provided it is stored as prescribed above.

[TEST PRINCIPLE]

This assay employs the competitive inhibition enzyme immunoassay technique. A monoclonal antibody specific for rat a1M has been pre-coated onto a microplate. A competitive inhibition reaction is launched between Horseradish Peroxidase (HRP) labeled rat a1M and unlabeled rat a1M (Standards or samples) with the pre-coated antibody specific for rat a1M. After incubation the unbound conjugate is washed off. The amount of bound HRP conjugate is reverse proportional to the concentration of a1M in the sample. After addition of the substrate solution, the intensity of color developed is reverse proportional to the concentration of a1M in the sample.

[SAMPLE COLLECTION AND STORAGE]

Serum - Use a serum separator tube and allow samples to clot for two hours at room temperature or overnight at 4°C before centrifugation for 20 minutes at approximately 1000×g. Assay freshly prepared serum immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.

Plasma - Collect plasma using EDTA or heparin as an anticoagulant. Centrifuge samples for 15 minutes at 1000×g at 2 - 8°C within 30 minutes of collection. Remove plasma and assay immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.

Urine - Aseptically collect the first urine of the day (mid-stream), voided directly into a sterile container. Centrifuge to remove particulate matter, assay immediately or aliquot and store at ≤-20°C. Avoid repeated freeze-thaw cycles.

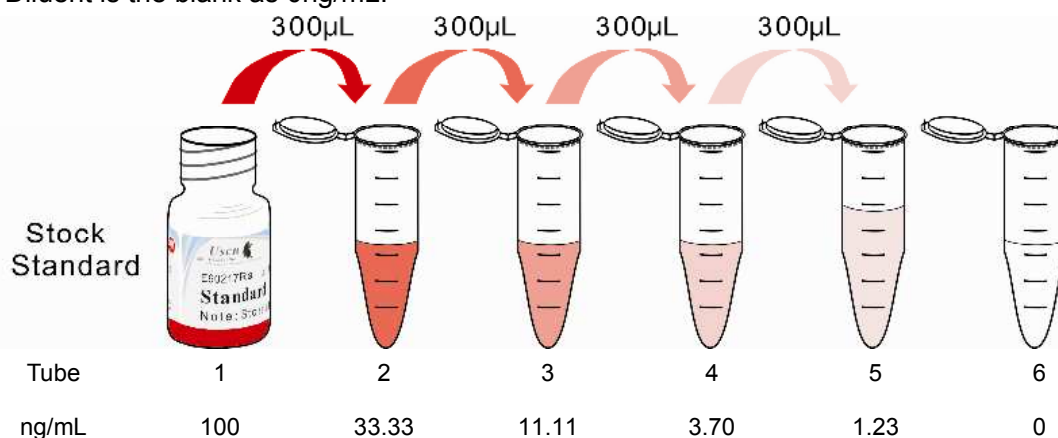
Other biological fluids - Centrifuge samples for 20 minutes at 1000×g. Remove particulates and assay immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.

Note:

1. Samples to be used within 5 days may be stored at 2-8°C, otherwise samples must stored at -20°C (≤1 month) or -80°C (≤2 months) to avoid loss of bioactivity and contamination.
2. Sample hemolysis will influence the result, so hemolytic specimen can not be detected.
3. When performing the assay slowly bring samples to room temperature.

[REAGENT PREPARATION]

1. Bring all kit components and samples to room temperature (18-25°C) before use.
2. **Standard** - Reconstitute the Standard with 0.4mL of Standard Diluent, kept for 10 minutes at room temperature, shake gently (not to foam). The concentration of the standard in the stock solution is 100ng/mL. Please prepare 5 tubes containing 0.6mL Standard Diluent and produce a triple dilution series according to the picture shown below. Mix each tube thoroughly before the next transfer. Set up 5 points of diluted standard such as 100ng/mL, 33.33ng/mL, 11.11ng/mL, 3.70ng/mL, 1.23ng/mL, and the last EP tubes with Standard Diluent is the blank as 0ng/mL.



3. **Assay Diluent A** - Dilute 6mL of Assay Diluent A Concentrate (2×) with 6mL of deionized or distilled water to prepare 12 mL of Assay Diluent A. **The prepared working dilution can't be frozen.**
4. **Detection Reagent A** - Briefly spin or centrifuge the stock Detection A before use. Dilute to the working concentration with working **Assay Diluent A** (1:100).
5. **Wash Solution** - Dilute 20mL of Wash Solution concentrate (30×) with 580mL of deionized or distilled water to prepare 600 mL of Wash Solution (1×).
6. **TMB substrate** - Aspirate the needed dosage of the solution with sterilized tips and do not dump the residual solution into the vial again.

Note:

1. Making serial dilution in the wells directly is not permitted.
2. Prepare standard within 15 minutes before assay. Please do not dissolve the reagents at 37°C directly.
3. Please carefully reconstitute Standards or working Detection Reagent A according to the instruction, and avoid foaming and mix gently until the crystals have completely dissolved. To minimize imprecision caused by pipetting, use small volumes and ensure that pipettors are calibrated. It is recommended to suck more than 10µL for once pipetting.
4. The reconstituted Standards and Detection Reagent A can be **used only once**.
5. If crystals have formed in the Wash Solution concentrate (30×), warm to room temperature and mix gently until the crystals have completely dissolved.
6. Distilled water is recommended to be used to make the preparation for reagents or samples. Contaminated water or container for reagent preparation will influence the detection result.

[SAMPLE PREPARATION]

1. Uscn, Inc. is only responsible for the kit itself, but not for the samples consumed during the assay. The user should calculate the possible amount of the samples used in the whole test. Please reserve sufficient samples in advance.
2. Please predict the concentration before assaying. If values for these are not within the range of the standard curve, users must determine the optimal sample dilutions for their particular experiments.
3. Serum/plasma samples require about a 4,000 fold dilution. For example, to prepare a 1:4,000 dilution of sample, transfer 10µL of sample to 390µL PBS. This yields a 1:40 dilution. Next, dilute the 1:40 sample by transferring 10µL to 990µL PBS. You now have a 1:4,000 dilution of your sample. Mix thoroughly at each stage. Sample should be diluted by 0.02mol/L PBS(PH=7.0-7.2).
4. If the samples are not indicated in the manual, a preliminary experiment to determine the validity of the kit is necessary.
5. Tissue or cell extraction samples prepared by chemical lysis buffer may cause unexpected ELISA results due to the impacts of certain chemicals.
6. Owing to the possibility of mismatching between antigen from other resource and antibody used in our kits (e.g., antibody targets conformational epitope rather than linear epitope), some native or recombinant proteins from other manufacturers may not be recognized by our products.
7. Influenced by the factors including cell viability, cell number and also sampling time, samples from cell culture supernatant may not be detected by the kit.
8. Fresh samples without long time storage is recommended for the test. Otherwise, protein degradation and denaturalization may occur in those samples and finally lead to wrong results.
9. If the humidity level in the laboratory does not reach 60%, a humidifier is recommended to be used.

[**ASSAY PROCEDURE**]

1. Determine wells for diluted standard, blank and sample. Prepare 5 wells for standard, 1 well for blank. Add 50µL each of dilutions of standard (read Reagent Preparation), blank and samples into the appropriate wells, respectively. And then add 50µL of Detection Reagent A to each tube immediately.
Shake the plate gently. Cover with a Plate sealer. Incubate for 1 hour at 37°C. Detection Reagent A may appear cloudy. Warm to room temperature and mix gently until solution appears uniform.
2. Aspirate the solution and wash with 350µL of 1X Wash Solution to each well using a squirt bottle, multi-channel pipette, manifold dispenser or autowasher, and let it sit for 1-2 minutes. Remove the remaining liquid from all wells completely by snapping the plate onto absorbent paper. Repeat 5 times. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against absorbent paper.
3. Add 90µL of Substrate Solution to each well. Cover with a new Plate sealer. Incubate for 15 - 25 minutes at 37°C (Don't exceed 30 minutes). Protect from light. The liquid will turn blue by the addition of Substrate Solution.
4. Add 50µL of Stop Solution to each well. The liquid will turn yellow by the addition of Stop solution. Mix the liquid by tapping the side of the plate. If color change does not appear uniform, gently tap the plate to ensure thorough mixing.
5. Remove any drop of water and fingerprint on the bottom of the plate and confirm there is no bubble on the surface of the liquid. Then, run the microplate reader and conduct measurement at 450nm immediately.

Note:

1. **Assay preparation:** Keep appropriate numbers of strips for 1 experiment and remove extra strips from microtiter plate. Removed strips should be resealed and stored at -20°C until the kits expiry date.
2. **Samples or reagents addition: Please use the freshly prepared Standard.** Please carefully add samples to wells and mix gently to avoid foaming. Do not touch the well wall as possible. For each step in the procedure, total dispensing time for addition of reagents or samples to the assay plate should not exceed 10 minutes. This will ensure equal elapsed time for each pipetting step, without interruption. Duplication of all standards and specimens, although not required, is recommended. 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.
3. **Incubation:** To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary. Do not allow wells to sit uncovered for extended periods between incubation steps. Once reagents have been added to the well strips, DO NOT let the strips DRY at any time during the assay. Incubation time and temperature must be observed.
4. **Washing:** The wash procedure is critical. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Solution by aspirating or decanting and remove any drop of water and fingerprint on the bottom of the plate. Insufficient washing will result in poor precision and falsely elevated absorbance reading.
5. **Controlling of reaction time:** Observe the change of color after adding **TMB Substrate** (e.g. observation once every 10 minutes), if the color is too deep, add **Stop Solution** in advance to avoid excessively strong reaction which will result in inaccurate absorbance reading.
6. **TMB Substrate** is easily contaminated. Please protect it from light.

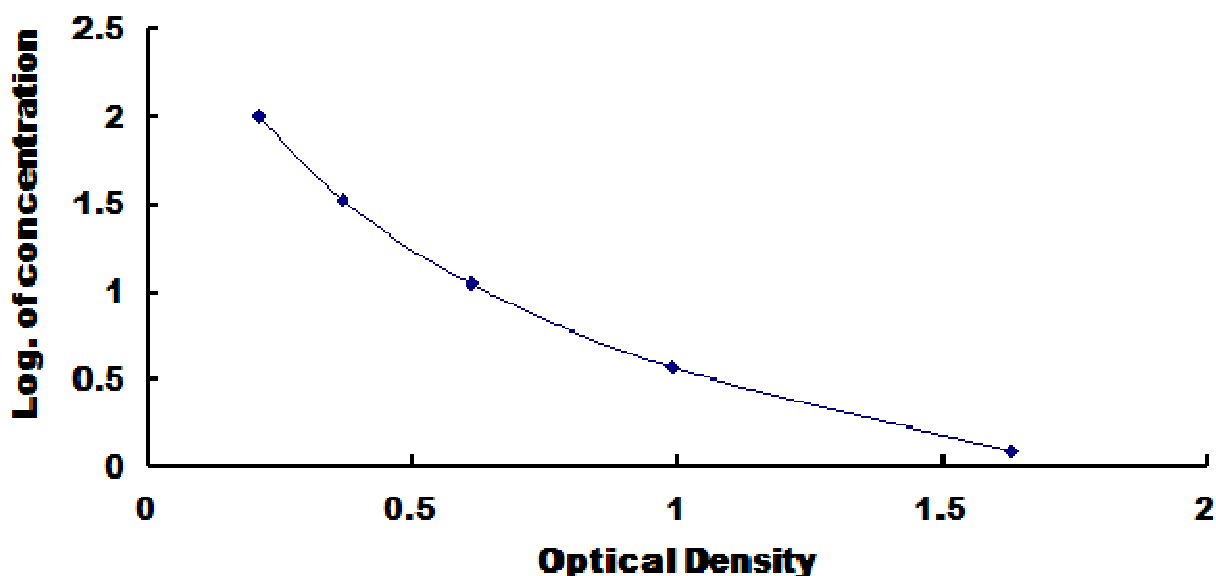
[CALCULATION OF RESULTS]

This assay employs the competitive inhibition enzyme immunoassay technique, so there is an inverse correlation between a1M concentration in the sample and the assay signal intensity. Low levels of a1M result in a high O.D value, while a high concentration of a1M results in a low signal.

Average the duplicate readings for each standard, control, and samples. Create a standard curve on log-log graph paper, with a1M concentration on the y-axis and absorbance on the x-axis. Draw the best fit straight line through the standard points and it can be determined by regression analysis. Using some plot software, such as curve expert 1.30, is also recommended. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.

[TYPICAL DATA]

In order to make the calculation easier, we plot the O.D. value of the standard (X-axis) against the log of concentration of the standard (Y-axis), although concentration is indeed the independent variable while O.D. value is the dependent variable. The O.D. values of the standard curve may vary according to the conditions of assay performance (e.g. operator, pipetting technique, washing technique or temperature effects). This curve is provided for demonstration only. The customers should establish their own standard curve for each test conducted.



Typical Standard Curve for Rat a1M ELISA.

[DETECTION RANGE]

1.23-100ng/mL. The standard curve concentrations used for the ELISA's were 100ng/mL, 33.33ng/mL, 11.11ng/mL, 3.70ng/mL, 1.23ng/mL.

[SENSITIVITY]

The minimum detectable dose of rat a1M is typically less than 0.47ng/mL.

The sensitivity of this assay, or Lower Limit of Detection (LLD) was defined as the lowest protein concentration that could be differentiated from zero. It was determined the mean O.D. Value of 20 replicates of the zero standard added by their three standard deviations.

[**SPECIFICITY**]

This assay has high sensitivity and excellent specificity for detection of rat a1M.

No significant cross-reactivity or interference between rat a1M and analogues was observed.

Note:

Limited by current skills and knowledge, it is impossible for us to complete the cross- reactivity detection between rat a1M and all the analogues, therefore, cross reaction may still exist.

[**ASSAY PROCEDURE SUMMARY**]

1. Prepare all reagents, samples and standards;
2. Add 50 μ L standard or sample to each well.
And then add 50 μ L prepared Detection Reagent A immediately.
Incubate 1 hour at 37 $^{\circ}$ C;
3. Aspirate and wash 5 times;
4. Add 90 μ L Substrate Solution. Incubate 15-25 minutes at 37 $^{\circ}$ C;
5. Add 50 μ L Stop Solution. Read at 450 nm immediately.

[**IMPORTANT NOTE**]

1. Limited by the current condition and scientific technology, we can't completely conduct the comprehensive identification and analysis on the raw material provided by suppliers. So there might be some qualitative and technical risks to use the kit.
2. The final experimental results will be closely related to validity of the products, operation skills of the end users and the experimental environments. Please make sure that sufficient samples are available.
3. Kits from different batches may be a little different in detection range, sensitivity and color developing time. Please perform the experiment exactly according to the instruction attached in kit while electronic ones from our website (www.uscnk.us; www.uscnk.cn; www.uscnk.com) is only for information.
4. Do not mix or substitute reagents from one kit lot to another. Use only the reagents supplied by manufacturer.
5. Protect all reagents from strong light during storage and incubation. All the bottle caps of reagents should be covered tightly to prevent the evaporation and contamination of microorganism.
6. There may be some foggy substance in the wells when the plate is opened at the first time. It will not have any effect on the final assay results. Do not remove microtiter plate from the storage bag until needed.
7. Wrong operations during the reagents preparation and loading, as well as incorrect parameter setting for the plate reader may lead to incorrect results. A microplate plate reader with a bandwidth of 10nm or less and an optical density range of 0-3 O.D. or greater at 450 \pm 10nm wavelength is acceptable for use in absorbance measurement. Please read the instruction carefully and adjust the instrument prior to the experiment. For more information, please refer to the operation video (<http://www.uscnk.com/homepage/operate-elisa.htm>).
8. Even the same operator might get different results in two separate experiments. In order to get better reproducible results, the operation of every step in the assay should be controlled. Furthermore, a preliminary experiment before assay for each batch is recommended.
9. Each kit has been strictly passed Q.C test. However, results from end users might be inconsistent with our in-house data due to some unexpected transportation conditions or different lab equipments. Intra-assay variance among kits from different batches might arise from above factors, too.

10. Kits from different manufacturers for the same item might produce different results, since we haven't compared our products with other manufacturers.
11. Valid period: six months.
12. The instruction manual also suit for the kit of 48T, but all reagents of 48T kit is reduced by half.

[PRECAUTION]

The Stop Solution suggested for use with this kit is an acid solution. Wear eye, hand, face, and clothing protection when using this material.