KAMIYA BIOMEDICAL COMPANY

Rat Melatonin (MT) ELISA

For the quantitative determination of rat MT in serum, plasma and other biological fluids

Cat. No. KT-21919

For Research Use Only. Not for use in diagnostic procedures.

Product Information

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INTENDED USE

This ELISA kit is a competitive inhibition enzyme immunoassay for the *in vitro* quantitative measurement of rat MT in serum, plasma and other biological fluids. For research use only. Not for use in diagnostic procedures.

COMPONENTS

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

MATERIALS REQUIRED BUT NOT SUPPLIED

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

STORAGE

All reagents should be stored according to their label. The **Calibrator**, **Detection Reagent A, Detection Reagent B** and the **96-well plate** should be stored at -20°C upon receipt. The unused strips should be kept in a sealed bag with the desiccant provided to minimize exposure to damp air. Opened test kits will remain stable until the expiration date, provided they are stored as prescribed above.

PRINCIPLE

This assay employs the competitive inhibition enzyme immunoassay technique. A polyclonal antibody specific for rat MT has been pre-coated onto a microplate. A competitive inhibition reaction is launched between HRP labeled rat MT and unlabeled rat MT (Calibrators or samples) with the pre-coated antibody specific for rat MT. The more the amount of rat MT in samples, the less the HRP labeled rat MT bound by pre-coated antibody. The substrate solution are added to the wells, respectively. And the color develops

in opposite to the amount of rat MT bound in the initial step. The color development is stopped and the intensity of the color is measured.

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℃ before centrifugation for 20 minutes at approximately 1,000 x g. Assay freshly prepared serum immediately or store samples in aliquots at -20℃ or -80℃ for later use. Avoid repeated freeze/thaw cycles.

Plasma

Collect plasma using EDTA or heparin as an anticoagulant. Centrifuge samples for 15 minutes at 1,000 x g at 4℃ within 30 minutes of collection. Remove plasma and assay immediately or store samples in aliquots at -20℃ or -80℃ for later use. Avoid repeated freeze/thaw cycles.

Other Biological Fluids

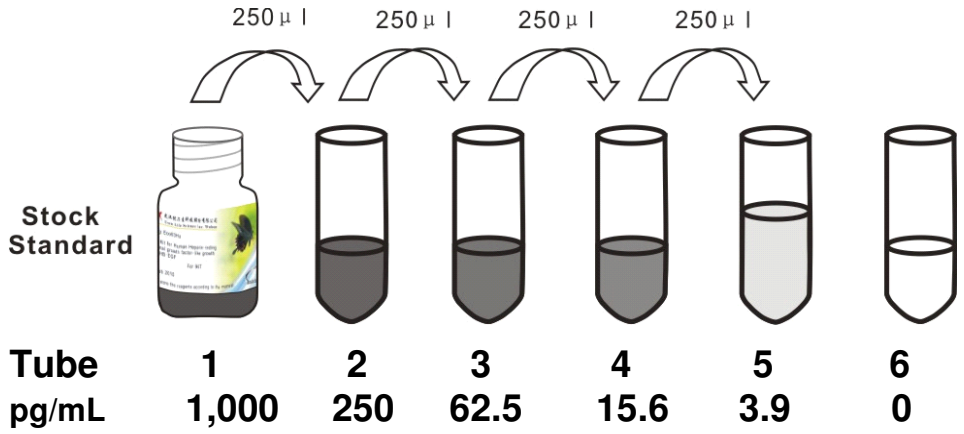
Centrifuge samples for 20 minutes at 1,000 x g. Remove particulates and assay immediately or aliquot samples and store at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.

Note:

1. Samples to be used within 5 days may be stored at 4°C, otherwise samples must be stored at -20°C (≤1 month) or -80°C (≤2 months) to avoid loss of bioactivity and contamination.
2. When performing the assay slowly bring samples to room temperature.
3. Sample hemolysis will influence the result, so hemolytic specimen cannot be detected.

REAGENT PREPARATION

1. Bring all kit components and samples to room temperature (18-25°C) before use.
2. **Calibrator -** Reconstitute the **Calibrator** with 0.8 mL of **Calibrator Diluent,** kept for 10 minutes at room temperature, shake gently (not to foam). The concentration of the calibrator in the stock solution is 1,000 pg/mL. Please prepare 5 tubes containing 0.75 mL Calibrator 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 calibrator such as 1,000 pg/mL, 250 pg/mL, 62.5 pg/mL, 15.6 pg/mL, 3.9 pg/mL, and the last EP tubes with **Calibrator Diluent** is the blank as 0 pg/mL.



3. **Assay Diluent A and B** - Dilute 6 mL of Assay Diluent A or B Concentrate (2X) with 6 mL of de-ionized or distilled water to prepare 12 mL of Assay Diluent A or B. The prepared working dilution can't be frozen**.**
4. **Detection Reagent A and B -** Briefly spin or centrifuge the stock Detection Reagent A and Detection Reagent B before use. Dilute to the working concentration with working **Assay Diluent A or B,** respectively (1:100).
5. **Wash Solution** - Dilute 20 mL of Wash Solution Concentrate (30X) with 580 mL of de-ionized or distilled water to prepare 600 mL of Wash Solution (1X).
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. Prepare the calibrators within 15 minutes before assay. Please do not dissolve the reagents at 37°C directly.
2. Making serial dilution in the wells directly is not permitted.
3. Please carefully reconstitute Calibrators or working Detection Reagent A and B according to the instruction. 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 10 µL for once pipetting.
4. The reconstituted Calibrators, Detection Reagent A and Detection Reagent B can be **used only once**.
5. If crystals have formed in the Wash Solution concentrate (30X), warm to room temperature and mix gently until the crystals have completely dissolved.

ASSAY PROCEDURE

Please predict the concentration before assaying. If values for these are not within the range of the calibration curve, users must determine the optimal sample dilutions for their particular experiments.

1. Determine wells for diluted calibrator, blank and sample. Prepare 5 wells for calibrator, 1 well for blank. Add 50 µL each of dilutions of calibrator (read Reagent Preparation), blank and samples into the appropriate wells, respectively. And then add 50 µL 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 350 µL 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 3 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 100 µL of **Detection Reagent B** working solution to each well. Incubate for 30 minutes at 37°C after covering it with the Plate sealer.

4. Repeat the aspiration/wash process for five times as conducted in step 4.

5. Add 90 µL of **Substrate Solution** to each well. Cover with a new Plate sealer. Incubate for 10 - 20 minutes at 37°C. Protect from light. The liquid will turn blue by the addition of Substrate Solution.

6. Add 50 µL 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.

7. 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 450 nm 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 4℃ until the expiration date.
2. **Sample or reagent additions: Please use the freshly prepared calibrator.** 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 calibrators and specimens, although not required, is recommended. To avoid cross-contamination, change pipette tips between additions of each calibrator 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 MT concentration in the sample and the assay signal intensity. Low levels of MT result in a high O.D value, while a high concentration of MT results in a low signal.

Average the duplicate readings for each calibrator, control, and samples. Create a calibration curve by using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, the data may be linearized by plotting the log of the MT concentrations versus the O.D. of the calibrator and the best fit line can be determined by regression analysis. If samples have been diluted, the concentration read from the calibration curve must be multiplied by the dilution factor.

PERFORMANCE

Detection Range

3.9–1,000 pg/mL. The calibration curve concentrations used for the ELISA's were 1,000 pg/mL, 250 pg/mL, 62.5 pg/mL, 15.6 pg/mL, 3.9 pg/mL.

Sensitivity

The minimum detectable dose of rat MT is typically less than 1.02 pg/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 calibrator plus three standard deviations.

Specificity

This assay has high sensitivity and excellent specificity for detection of rat MT. No significant cross-reactivity or interference was observed.

TYPICAL DATA

In order to make the calculation easier, we plot the O.D. value of the calibrator (X-axis) against the known log of concentration of the calibrator (Y-axis), although concentration is indeed the independent variable while O.D. value is the dependent variable. The O.D. values of the calibration 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 calibration curve for each test conducted.

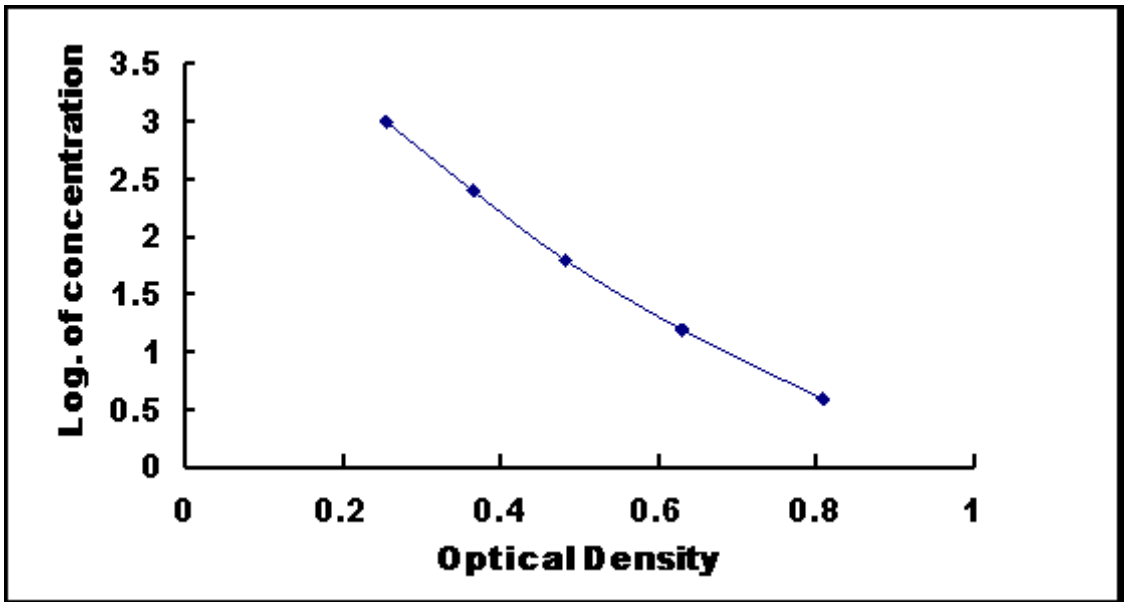


Figure 1: Typical Standard Curve for Rat MT ELISA.

IMPORTANT NOTE

1. The final experimental results will be closely related to operation skills of the end users and the experimental environments. Please make sure that sufficient samples are available.
2. This assay is designed to eliminate interference by soluble receptors, ligands, binding proteins, and other factors present in biological samples. Until all factors have been tested in the assay, the possibility of interference cannot be excluded.
3. Do not mix or substitute reagents from one kit lot to another. Use only the reagents supplied by manufacturer.
4. 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.
5. 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.
6. A microtiter plate reader with a bandwidth of 10 nm or less and an optical density range of 0-3 O.D. or greater at 450 nm wavelength is acceptable for use in absorbance measurement.

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.

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