

# Adrenaline/Epinephrine (EPI) ELISA Kit

rev 02/21

(Catalog # E4359-100, 100 assays, Store at 4°C)

## I. Introduction:

Epinephrine, also known as adrenalin or adrenaline, is a hormone, neurotransmitter and medication. Epinephrine is normally produced by both the adrenal glands and certain neurons. It plays an important role in the fight-or-flight response by increasing blood flow to muscles, output of the heart, pupil dilation, and blood sugar. It does this by binding to alpha and beta receptors. It is found in many animals and some single cell organisms. BioVision's Adrenaline/Epinephrine ELISA kit is a competitive ELISA assay for the quantitative measurement of Adrenaline in serum, plasma and cell culture supernatants. The density of color is inversely proportional to the amount of Adrenaline captured from the samples.

## II. Application:

This ELISA kit is used for *in vitro* quantitative determination of Adrenaline/Epinephrine in serum, plasma, and other biological fluids

Detection Range: 7.813 - 500 pg/ml

Sensitivity: < 4.688 pg/ml

Assay Precision: Intra-Assay: CV < 8%; Inter-Assay: CV < 10% (CV (%) = SD/mean X 100)

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

## III. Sample Type:

Serum, plasma, tissue homogenates and other biological fluids

## IV. Kit Contents:

Components	E4359-100	Part No.
Micro ELISA Plate	8 X 12 strips	E4359-100-1
Lyophilized Standard	2 vials	E4359-100-2
Sample / Standard dilution buffer	20 ml	E4359-100-3
Biotin- detection antibody (Concentrated)	60 µl	E4359-100-4
Antibody dilution buffer	10 ml	E4359-100-5
HRP-Streptavidin Conjugate (SABC) (Avoid light)	120 µl	E4359-100-6
SABC dilution buffer	10 ml	E4359-100-7
TMB substrate (Avoid light)	10 ml	E4359-100-8
Stop Solution	10 ml	E4359-100-9
Wash buffer (25X)	30 ml	E4359-100-10
Plate sealers	5	E4359-100-11

## V. User Supplied Reagents and Equipment:

- Microplate reader capable of measuring absorbance at 450 nm
- 37°C incubator
- Precision pipettes with disposable tips
- Clean eppendorf tubes for preparing standards or sample dilutions
- Absorbent paper

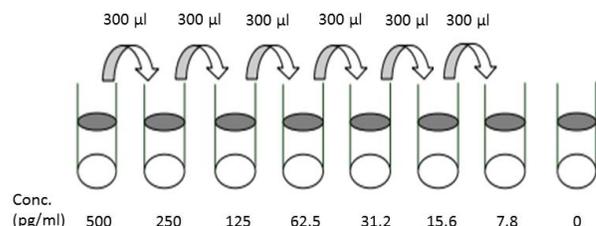
## VI. Storage and Handling:

The entire kit may be stored at 4°C for up to 6 months from the date of shipment.

## VII. Reagent and Sample Preparation:

**Note:** Prepare reagents within 30 minutes before the experiment. Before using the kit, spin tubes and bring down all components to the bottom of tubes.

1. **Biotin- detection antibody working solution:** Calculate the total volume of the working solution: 0.05 ml / well x quantity of wells with additional 0.1 - 0.2 ml of the total volume. Dilute the Biotin- detection antibody with Antibody dilution buffer at 1:100 and mix thoroughly.
2. **HRP-Streptavidin Conjugate (SABC):** Calculate the total volume of the working solution: 0.1 ml / well x quantity of wells with additional 0.1 - 0.2 ml of the total volume. Dilute the SABC with SABC dilution buffer at 1:100 and mix thoroughly.
3. **Wash Buffer:** Dilute 30 mL of Concentrated Wash Buffer into 750 mL of Wash Buffer with deionized or distilled water. Put unused solution back at 4°C. If crystals have formed in the concentrate, warm it with 40°C water bath and mix it gently until the crystals have completely dissolved. The solution should be cooled to room temperature before use.
4. **Standard Preparation:**
  - Reconstitute the lyophilized Adrenaline standard by adding 1 ml of Standard/Sample Dilution Buffer to make the 500 pg/ml standard stock solution. Use within 2 hours after reconstituting.



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- Allow solution to sit at room temperature for 10 minutes, then gently vortex to mix completely.
- Label 6 tubes as 250, 125, 62.5, 31.25, 15.625, and 7.813 pg/ml. Add 0.3 ml of Standard/Sample Dilution Buffer in each tube. Add 0.3 ml of 500 pg/ml in Tube 1 (250 pg/ml) and mix thoroughly. Transfer 0.3 ml from Tube 1 to Tube 2 and mix thoroughly. Transfer 0.3 ml from Tube 2 to Tube 3 and mix thoroughly and so on. Add only Standard/Sample Dilution Buffer to 0 pg/ml Standard tube.

#### 5. Sample Preparation:

**Note:** 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. Avoid multiple freeze-thaw cycles.

- **Serum:** Coagulate the serum for 2 hour at room temperature or overnight at 4°C. Centrifuge at approximately 1000 × g for 20 min. Collect the supernatant and carry out the assay immediately. Blood collection tubes should be disposable, non-pyrogenic, and non-endotoxin.
- **Plasma:** Collect plasma using EDTA-Na<sub>2</sub> as an anticoagulant. Centrifuge samples for 15 minutes at 1000×g at 2 - 8°C within 30 minutes of collection. Collect the supernatant and carry out the assay immediately. Avoid hemolysis, high cholesterol samples.
- **Tissue homogenates:** Rinse the tissues with ice-cold PBS (0.01 M, pH=7.4) to remove excess hemolysis blood thoroughly. Tissue pieces should be weighed and then minced to small pieces which will be homogenized in PBS (the volume depends on the weight of the tissue. 9 mL PBS would be appropriate for 1 g of tissue. Some protease inhibitor is recommended to add into the PBS.) with a glass homogenizer on ice. To further break the cells, sonicate the suspension with an ultrasonic cell disrupter or subject it to freeze-thaw cycles. The homogenates are then centrifuged for 5 minutes at 5000×g to retrieve the supernatant.
- **Cell culture supernatant:** Centrifuge supernatant for 20 minutes to remove insoluble impurity and cell debris at 1000×g at 2 - 8°C. Collect the clear supernatant and carry out the assay immediately or aliquot and store at -20°C.
- **Other biological fluids:** Centrifuge samples for 20 min at 1000×g at 4°C. Collect the supernatant and carry out the assay immediately.
- End user should estimate the concentration of the target protein in the test sample first, and select a proper dilution factor to make the diluted target protein concentration fall in the optimal detection range of the kit.

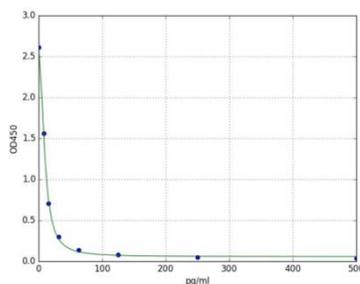
#### VIII. Assay Protocol:

**Note:** Bring all reagents and samples to room temperature 30 minutes prior to the assay. It is recommended that all standards and samples be run at least in duplicate. A standard curve must be run with each assay.

1. Prepare all reagents, samples and standards as instructed in **section VII**.
2. Wash plate 2 times with **1X Wash Solution** before adding **standards** and **samples**.
3. Add 50 µl of each **standards** or **samples** into appropriate wells. Immediately add 50 µl of **Biotin-detection antibody** work solution into the above wells. Seal the plate and incubate at 37°C for 45 min.
4. Discard the solution and wash 3 times with **1X Wash Solution**. Wash by filling each well with Wash Buffer (350 µl) using a multi-channel pipette or autowasher. Let it soak for 1-2 minutes, and then remove all residual wash-liquid from the wells by aspiration. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Clap the plate on absorbent filter papers or other absorbent materials.
5. Add 100 µl of **SABC working solution** into each well, cover the plate and incubate at 37°C for 30 min.
6. Discard the solution and wash 5 times with **1X Wash Solution** as **step 4**.
7. Add 90 µl of **TMB substrate** into each well, cover the plate and incubate at 37 °C in dark within 15-20 min. The shades of blue should be seen in the first 3-4 wells by the end of incubation.
8. Add 50 µl of **Stop Solution** to each well. Read result at 450 nm within 20 minutes.

#### IX. CALCULATION:

If standards and samples were run in duplicates, average the duplicate readings. Prepare the standard curve by plotting the mean O.D. of each standard solution (Y-axis) vs. the respective concentration of the standard solution (X-axis). The Adrenaline/Epinephrine concentration of the samples can be interpolated from the standard curve. If the samples were diluted, multiply the dilution factor with the concentrations interpolated from the standard curve to obtain the actual concentration.



**Figure:** Typical Standard Curve: These standard curves are for demonstration only. A standard curve must be run with each assay.

<b>X-axis</b>	<b>pg/ml</b>	0	7.812	15.625	31.25	62.5	125	250	500
<b>Y-axis</b>	<b>OD 450 nm</b>	2.611	1.561	0.706	0.302	0.14	0.079	0.05	0.037

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**X. RECOVERY:**

Matrix	Recovery range (%)	Average(%)
serum(n=5)	85-105	94
EDTA plasma(n=5)	89-105	96
heparin plasma(n=5)	95-100	98

**XI. LINEARITY:**

Sample	1:2	1:4	1:8	1:16
serum(n=5)	85-100%	87-102%	88-103%	91-103%
EDTA plasma(n=5)	83-94%	85-96%	87-100%	88-98%
heparin plasma(n=5)	82-93%	83-98%	85-100%	86-97%

**XII. RELATED PRODUCTS:**

- Norepinephrine (NE) (Human) ELISA Kit (Cat. No. E4360)
- Beta3-AR Antibody (Cat. No. 3939)
- Anti-BAR2 Antibody (Cat. No. A1057)