



EGF (rat) ELISA Kit

(Catalog # K4024-100, 100 assays; Store at -20 °C)

Rev 6/21

I. Introduction:

BioVision's rat EGF (Epidermal Growth Factor) ELISA Kit is based on the standard sandwich enzyme-linked immunosorbent assay technology. This assay employs a monoclonal antibody from mouse specific for EGF coated on a 96-well plate. Standards (*E. coli*, N974-R1026) and test samples are added to the wells and EGF present in a sample is bound to the wells by the immobilized antibody. A biotinylated detection polyclonal antibody from goat specific for EGF is added subsequently. After washing away the unbound biotinylated antibody with wash buffer, avidin-Biotin-Peroxidase Complex is added to the wells. The wells are again washed with buffer to remove the unbound conjugates. HRP substrate TMB is used to visualize the HRP enzymatic reaction. TMB is catalyzed by HRP to produce a blue color product that changes into yellow after adding acidic stop solution. The density of yellow color is proportional to the rat EGF captured onto the plate. This ELISA kit shows no cross-reactivity with other relevant proteins.

II. Applications:

- For the quantitation of Rat EGF in various sample types.
- Detection Range: 7.8 pg/ml – 500 pg/ml
- Sensitivity: < 1 pg/ml.

III. Specificity:

- Natural and recombinant rat EGF.

IV. Sample Types:

- Serum & plasma (heparin, EDTA)
- Cell culture supernatants
- Urine

V. Kit Contents:

| Components | K4024-100 | Part No. |
|---|---------------------|--------------|
| EGF Microplate coated with anti-rat monoclonal Ab against EGF, 96 wells | 12 strips x 8 wells | K4024-100-1 |
| Lyophilized recombinant rat EGF standard (10 ng/vial) | 2 vials | K4024-100-2 |
| Biotinylated anti-rat EGF antibody | 130 µl | K4024-100-3 |
| Avidin-Biotin-Peroxidase Complex (ABC) | 130 µl | K4024-100-4 |
| Sample diluent buffer | 30 ml | K4024-100-5 |
| Antibody diluent buffer | 12 ml | K4024-100-6 |
| ABC diluent buffer | 12 ml | K4024-100-7 |
| TMB color developing agent (Colorless) | 10 ml | K4024-100-8 |
| TMB stop solution | 10 ml | K4024-100-9 |
| Wash buffer (25X) | 20 ml | K4024-100-10 |
| Plate sealers | 4 | K4024-100-11 |

VI. User Supplied Reagents and Equipment:

- Microplate reader capable of measuring absorbance at 450 nm.
- Absorbent paper.
- Adjustable pipettes and pipette tips. Multichannel pipettes are recommended in the condition of large amount of samples in the detection.
- **Wash buffer working solution:** Prepare 500 ml of Wash buffer working solution by diluting the supplied 20 ml of Wash buffer (25X) with 480 ml of deionized or distilled water. If crystals have formed in the concentrate, warm to room temperature (RT) and mix it gently until crystals have completely dissolved.

VII. Storage Conditions and Reagent Preparation:

Store the kit at 4 °C for 6 months or at -20 °C for 12 months. Avoid repeated freeze-thaw cycles. Spin tubes briefly to bring down all components to the bottom of tubes.

- **Reconstitution of the recombinant rat EGF standard:** Two vials of EGF standard (10 ng per vial) are included in each kit. Use one vial for each experiment. Prepare 10,000 pg/ml of rat EGF standard solution by adding 1ml of sample diluent buffer into one of the vials. Keep the tube at RT for 10 min and mix thoroughly. Add 0.05 ml of the above 10 ng/ml EGF standard solution into 0.95 ml sample diluent buffer to make **500 pg/ml Standard** and mix thoroughly. **Label 6 Eppendorf tubes** with 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.25 pg/ml, 15.63 pg/ml & 7.81 pg/ml respectively. Aliquot 0.3 ml of the sample diluent buffer into each tube. Add 0.3 ml of the 500 pg/ml EGF standard solution into 1st tube and mix. Transfer 0.3 ml from 1st tube to 2nd tube and mix. Transfer 0.3 ml from 2nd tube to 3rd tube and mix, and so on. **Note:** The standard solutions are best used within 2 hrs. The 10 ng/ml standard solution should be stored at 4 °C for up to 12 hr, or at -20 °C for up to 48 hrs. Avoid repeated freeze-thaw cycles. Sample diluent serves as the **0 Standard**.
- **Preparation of biotinylated anti-rat EGF antibody working solution:** Dilute 1:100 with the antibody diluent buffer and mix thoroughly. Prepare 0.1 ml of EGF antibody working solution for each well. Solution should be prepared no more than 2 hrs. prior to the experiment.
- **Preparation of Avidin-Biotin-Peroxidase Complex (ABC) working solution:** Dilute 1:100 with the ABC dilution buffer and mix thoroughly. Prepare 0.1 ml of ABC working solution for each well. Solution should be prepared no more than 1 hr. prior to the experiment.

VIII. Sample Preparation and Storage:

Centrifuge cell culture supernates to remove particulates, assay immediately or aliquot and store at -20 °C. Allow the serum to clot in a serum separator tube (about 4 hrs) at RT. Centrifuge at approximately 1000 x g for 15 min. Analyze the serum immediately or aliquot and store at -20 °C. Collect plasma using heparin or EDTA as an anticoagulant. Centrifuge for 15 min. at 1500 x g within 30 min. of collection. Analyze immediately or aliquot and store frozen at -20 °C. Aseptically collect the first urine of the day, micturate directly into a sterile



...amples at -20 °C. Rinse tissue with PBS to remove excess blood, chop into 1-2mm pieces, and homogenize with a tissue homogenizer in PBS. Centrifuge at approximately 5000 x g for 5 min. Assay immediately or aliquot and store homogenate at -20 °C. Avoid repeated freeze-thaw cycles.

Notes:

- a. Store samples to be assayed within 24 hrs. at 2-8 °C. For long-term storage, aliquot and freeze samples at -20 °C. Avoid repeated freeze-thaw cycles.
- b. Sample dilution guidelines: The user needs to estimate the concentration of the target protein in the sample and select a proper dilution factor so that the diluted target protein concentration falls near the middle of the linear regime in the standard curve. Dilute the sample using the provided diluent buffer. The sample must be well mixed with the diluents buffer. The following is a guideline for sample dilution. Several trials may be necessary in practice. For high target protein concentration (5-50 ng/ml): dilute 1:100. For medium target protein concentration (0.5-5 ng/ml): dilute 1:10. For low target protein concentration (7.8-500 pg/ml): dilute 1:2. For very low target protein concentration (≤ 7.8 pg/ml). No dilution necessary or dilute 1:2.

IX. Assay Protocol:

The ABC working solution and TMB color developing agent must be kept warm at 37°C for 30 min. before use. When diluting samples and reagents, they must be mixed completely and evenly. Don't let 96-well plate dry, as it will inactivate active components on plate.

1. Aliquot 0.1 ml per well of the 500 pg/ml, 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.25 pg/ml, 15.63 pg/ml & 7.81 pg/ml **rat EGF standard solutions** into the precoated 96-well plate. Add 0.1 ml of the **sample diluent buffer** into the control well (Zero well). Add 0.1 ml of each properly diluted sample of rat cell culture supernatant, serum or plasma (heparin, EDTA), tissue homogenates or urine to each empty well. See "Sample Dilution Guideline" for details.

Notes:

- a. We recommend that each rat EGF standard solution and each sample is measured in duplicates.
 - b. We recommend doing a pilot experiment using standards and a small number of samples to inspect the validity of experiment operation and the appropriateness of sample dilution proportion.
2. Seal the plate with the cover and incubate at 37 °C for 90 min. Remove the cover, discard plate content, and blot the plate onto paper towels or other absorbent material. Do not let the wells completely dry at any time.
 3. Add 0.1 ml of **biotinylated anti-rat EGF antibody working solution** into each well and incubate the plate at 37 °C for 60 min. Wash plate 3 times with **Wash buffer working solution**, and each time let washing buffer stay in the wells for 1 min. Discard the washing buffer and blot the plate onto paper towels or other absorbent material. (**Plate Washing Method:** Discard the solution in the plate without touching the side walls. Blot the plate onto paper towels or other absorbent material. Soak each well with at least 0.3 ml wash buffer for 1~2 min. Repeat this process two additional times for a total of three washes. **Note:** For automated washing, aspirate all wells and wash three times with wash buffer, overfilling wells with wash buffer. Blot the plate onto paper towels or other absorbent material.)
 4. Add 0.1 ml of prepared **ABC working solution** into each well and incubate the plate at 37°C for 30 min. Wash plate 5 times with **Wash buffer working solution**, and each time let washing buffer stay in the wells for 1-2 min. Discard the washing buffer and blot the plate onto paper towels or other absorbent material. (See Step 3 for plate washing method).
 5. Add 90µl of **prepared TMB color developing agent** into each well and incubate plate at 37 °C in dark for 20-25 min. **Note:** For reference only, the optimal incubation time should be determined by end user. The shades of blue can be seen in the wells with the four most concentrated rat EGF standard solutions; the other wells show no obvious color.
 6. Add 0.1ml of prepared **TMB stop solution** into each well. The color changes into yellow immediately.
 7. Read the O.D. absorbance at 450 nm in a microplate reader within 30 min. after adding the stop solution.
 8. Calculation: $Relative\ O.D._{450\ nm} = O.D._{450\ nm}$ of each well – $O.D._{450\ nm}$ of Zero well. The Standard Curve can be plotted as the relative $O.D._{450}$ of each standard solution (Y) vs. the respective concentration of the standard solution (X). The rat EGF concentration of the samples can be interpolated from the Standard Curve. **Note:** if the samples were diluted, multiply the dilution factor to the concentrations from interpolation to obtain the concentration before dilution.

Typical Data Obtained from Rat EGF
(TMB reaction incubated at 37 °C for 20 min.)

| Concentration(pg/ml) | 0 | 7.8 | 15.6 | 31.2 | 62.5 | 125 | 250 | 500 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| O.D. | 0.024 | 0.060 | 0.115 | 0.200 | 0.384 | 0.777 | 1.422 | 2.495 |

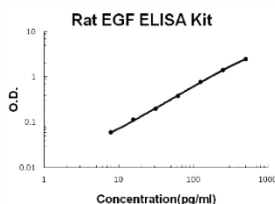


Figure: Standard Curve: This standard curves is for demonstration only. A standard curve must be run with each assay.

X. RELATED PRODUCTS:

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| Human CellExp™ EGF, human recombinant (7228) | EGF Antibody (5022, 5023R, 5023) |
| EGF (mouse) ELISA Kit (K4023) | EGF (human) ELISA Kit (K4022) |
| EGF, human recombinant (4022) | EGF, mouse recombinant (4023), EGF, rat recombinant (4024) |