Rat Activin A ELISA Kit

Catalog No.: BEK1004

Size: 96T

Range: 15.6 pg/ml - 1000 pg/ml

Sensitivity < 7.8 pg/ml

Storage and Expiration: Store at 2-8℃ for 6 months, or at -20℃ for 12 months.

Application: For quantitative detection of Activin A in rat serum, plasma, body fluids, tissue lysates or cell culture supernatants.

Introduction

Activin A, the homodimer of the beta-A subunit, is a cytokine member of the transforming growth factor-beta superfamily. It is produced in the gonads, pituitary gland, placenta, and other organs, and is expressed locally by the mesenchymal component of the hemopoietic microenvironment. It had a mitogenic effect on rat osteoblastic cells and suppressed their alkaline phosphatase activity. It also has an important role in the inflammatory response and that FST may have significant therapeutic potential to reduce the severity of inflammatory diseases.

Principle of the Assay

This kit was based on sandwich enzyme-linked immune-sorbent assay technology. Anti- Activin A polyclonal antibody was pre-coated onto 96-well plates. And the biotin conjugated anti- Activin A polyclonal antibody was used as detection antibodies. The standards, test samples and biotin conjugated detection antibody were added to the wells subsequently, and wash with wash buffer. Avidin-Biotin-Peroxidase Complex was added and unbound conjugates were washed away with wash buffer. TMB substrates were used to visualize HRP enzymatic reaction. TMB was catalyzed by HRP to produce a blue color product that changed into yellow after adding acidic stop solution. The density of yellow is proportional to the Activin A amount of sample captured in plate. Read the O.D. absorbance at 450nm in a microplate reader, and then the concentration of Activin A can be calculated.

Kit components

1. One 96-well plate pre-coated with anti-rat Activin A antibody
2. Lyophilized rat Activin A standards: 2 tubes (10ng / tube)
3. Sample / Standard diluent buffer: 30ml
4. Biotin conjugated anti-rat Activin A antibody (Concentrated): 130μl. Dilution: 1:100
5. Antibody diluent buffer: 12ml
6. Avidin-Biotin-Peroxidase Complex (ABC) (Concentrated): 130μl. Dilution: 1:100
7. ABC diluent buffer: 12ml
8. TMB substrate: 10ml
9. Stop solution: 10ml
10. Wash buffer (25X): 30ml

Note: Reconstitute standards and test samples with Kit Component 3.

Material Required But Not Provided

1. 37℃ incubator
2. Microplate reader (wavelength: 450nm)
3. Precise pipette and disposable pipette tips
4. Automated plate washer
5. ELISA shaker
6. 1.5ml of Eppendorf tubes
7. Plate cover
8. Absorbent filter papers
9. Plastic or glass container with volume of above 1L

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Protocol

- **Preparation of sample and reagents**

1. Sample

Isolate the test samples soon after collecting, then, analyze immediately (within 2 hours). Or aliquot and store at -20℃ for long term. Avoid multiple freeze-thaw cycles.

✧ **Body fluids, tissue lysates and cell culture supernatants:** Centrifuge to remove precipitate, analyze immediately or aliquot and store at -20℃.

✧ **Serum:** Coagulate the serum at room temperature (about 2 hours). Centrifuge at approximately 1000-2000 × g for 10 min. Analyze the serum immediately or aliquot and store at -20℃.

✧ **Plasma:** Collect plasma using EDTA as an anticoagulant, and mix for 10-20 min, Centrifuge at approximately 1000-2000 × g for 10 min of collection. If precipitation appeared, centrifuge again.

Note: 1. Coagulate blood samples completely, then, centrifuge, and avoid hemolysis and particle.
2. NaN_3 can not be used as test sample preservative, since it is the inhibitor for HRP.
3. After collecting samples, analyze immediately or aliquot and store frozen at -20°C. Avoid repeated freeze-thaw cycles.

>> Sample Dilution Guideline

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 falls the optimal detection range of the kit. Dilute the sample with the provided diluent buffer, and several trials may be necessary in practice. The test sample must be well mixed with the diluent buffer.

✧ **High target protein concentration (10-100 ng/ml)**: Dilution: 1:100. i.e. Add 3 µl of sample into 297 µl of Sample / Standard diluent buffer (Kit Component 3).

✧ **Medium target protein concentration (1-10 ng/ml)**: Dilution: 1:10. i.e. Add 25 µl of sample into 225 µl of Sample / Standard diluent buffer (Kit Component 3).

✧ **Low target protein concentration (15.6-1000 pg/ml)**: Dilution: 1:2. i.e. Add 100 µl of sample into 100 µl of Sample / Standard diluent buffer (Kit Component 3).

✧ **Very low target protein concentration (≤15.6 pg/ml)**: Unnecessary to dilute.

2. Wash buffer

Dilute the concentrated Wash buffer 25-fold (1:25) with distilled water (i.e. add 30ml of concentrated wash buffer into 720ml of distilled water).

3. Standard

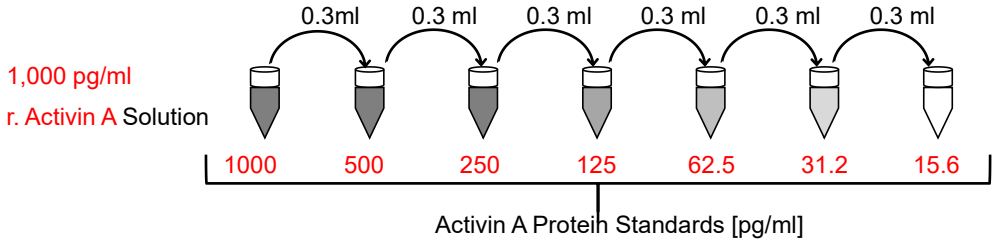
Reconstitution of the Lyophilized rat Activin A standard (Kit Component 2): standard solution should be prepared no more than 2 hours prior to the experiment. Two tubes of standard are included in each kit. Use one tube for each experiment. **(Note: Do not dilute the standard directly in the plate)**

a. 10,000 pg/ml of standard solution: Add **1 ml** of Sample / Standard diluent buffer (Kit Component 3) into one Standard (Kit Component 2) tube, keep the tube at room temperature for 15 min and mix thoroughly.

b. 1000 pg/ml of standard solution: Add **0.1 ml** of the above 10 ng/ml standard solution into **0.9 ml** sample diluent buffer (Kit Component 3) and mix thoroughly.

c. 500 pg/ml → 15.6 pg/ml of standard solutions: Label 6 Eppendorf tubes with 500 pg/ml, 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.2 pg/ml, 15.6 pg/ml, respectively. Aliquot **0.3 ml** of the Sample / Standard diluent buffer (Kit Component 3) into each tube. Add **0.3 ml** of the above 1,000 pg/ml standard solution

into 1st tube and mix thoroughly. Transfer **0.3 ml** from 1st tube to 2nd tube and mix thoroughly. Transfer **0.3 ml** from 2nd tube to 3rd tube and mix thoroughly, and so on.



Note: The standard solutions are best used within 2 hours. The 10,000 pg/ml standard solution should be used within 12 hours. Or store at -20℃ for up to 48 hours. Avoid repeated freeze-thaw cycles.

4. Preparation of Biotin conjugated anti-rat Activin A antibody (Kit Component 4) working solution: prepare no more than 2 hours before the experiment.

a. Calculate the total volume of the working solution: 0.1 ml / well × quantity of wells. (Allow 0.1-0.2 ml more than the total volume)

b. Dilute the Biotin conjugated anti-rat Activin A antibody (Kit Component 4) with Antibody diluent buffer (Kit Component 5) at 1:100 and mix thoroughly. i.e. Add 1 μl of Biotin conjugated anti-rat Activin A antibody into 99 μl of Antibody diluent buffer.

5. Preparation of Avidin-Biotin-Peroxidase Complex (ABC) (Kit Component 6) working solution: prepare no more than 1 hour before the experiment.

a. Calculate the total volume of the working solution: 0.1 ml / well × quantity of wells. (Allow 0.1-0.2 ml more than the total volume)

b. Dilute the Avidin-Biotin-Peroxidase Complex (ABC) (Kit Component 6) with ABC diluent buffer (Kit Component 7) at 1:100 and mix thoroughly. i.e. Add 1 μl of Avidin-Biotin-Peroxidase Complex (ABC) into 99 μl of ABC diluent buffer.

- **Assay procedure**

Before adding to wells, equilibrate the ABC working solution and TMB substrate (Kit Component 8) for at least 30 min at room temperature (37℃). It is recommend to plot a standard curve for each test.

1. Set standard, test sample and control (zero) wells on the pre-coated plate respectively, and then, record their positions. It is recommend to measure each standard and sample in duplicate.
2. Aliquot 0.1 ml of 1000 pg/ml, 500 pg/ml, 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.2 pg/ml, 15.6 pg/ml standard solutions into the standard wells.
3. Add 0.1 ml of Sample / Standard diluent buffer (Kit Component 3) into the control (zero) well.
4. Add 0.1 ml of properly diluted sample (rat serum, body fluids, tissue lysates or cell culture supernatants) into test sample wells.
5. Seal the plate with a cover and incubate at 37℃ for 90 min.
6. Remove the cover and discard the plate content, clap the plate on the absorbent filter papers or other absorbent material. **Do NOT let the wells completely dry at any time. Do not wash plate!**
7. Add 0.1 ml of Biotin conjugated anti-rat Activin A antibody work solution into the above wells (standard, test sample & zero wells). Add the solution at the bottom of each well without touching

the side wall.

8. Seal the plate with a cover and incubate at 37℃ for 60 min.
9. Remove the cover, and wash plate 3 times with Wash buffer (Kit Component 10) using one of the following methods:

   Manual Washing: Discard the solution in the plate without touching the side walls. Clap the plate on absorbent filter papers or other absorbent material. Fill each well completely with Wash buffer (Kit Component 10) and vortex mildly on ELISA shaker for 2 min, then aspirate contents from the plate, and clap the plate on absorbent filter papers or other absorbent material. Repeat this procedure two more times for a **total of THREE washes**.

   Automated Washing: Aspirate all wells, then wash plate **THREE times** with Wash buffer (Kit Component 10) (overfilling wells with the buffer). After the final wash, invert plate, and clap the plate on absorbent filter papers or other absorbent material. It is recommended that the washer be set for a soaking time of 1 min or shaking.
10. Add 0.1 ml of ABC working solution into each well, cover the plate and incubate at 37℃ for 30 min.
11. Remove the cover and wash plate 5 times with Wash buffer (Kit Component 10), and each time let the wash buffer stay in the wells for 1-2 min. (See Step 9 for plate wash method).
12. Add 0.1 ml of TMB substrate (Kit Component 8) into each well, cover the plate and incubate at 37℃ in dark within 30 min. (**Note:** This incubation time is for reference use only, the optimal time should be determined by end user.) And the shades of blue can be seen in the first 3-4 wells (with most concentrated rat Activin A standard solutions), the other wells show no obvious color.
13. Add 0.1 ml of Stop solution (Kit Component 9) into each well and mix thoroughly. The color changes into yellow immediately.
14. Read the O.D. absorbance at 450 nm in a microplate reader within 30 min after adding the stop solution.

For calculation, (the relative $O.D._{450}$) = (the $O.D._{450}$ of each well) – (the $O.D._{450}$ 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 Activin A concentration of the samples can be interpolated from the standard curve.

Note: If the samples measured were diluted, multiply the dilution factor to the concentrations from interpolation to obtain the concentration before dilution.

Precautions

10. Before the experiment, centrifuge each kit component for several minutes to bring down all reagents to the bottom of tubes.
11. It is recommend to measure each standard and sample in duplicate.
12. Do NOT let the plate completely dry at any time! Since the dry condition can inactivate the biological material on the plate.
13. Do not reuse pipette tips and tubes to avoid cross contamination.
14. Do not use the expired components and the components from different batches.
15. To avoid the marginal effect of plate incubation for temperature differences (the marginal wells always get stronger reaction), it is recommend to equilibrate the ABC working solution and TMB substrate for at least 30 min at room temperature (37℃) before adding to wells.
16. The TMB substrate (Kit Component 8) is colorless and transparent before use, if not, please

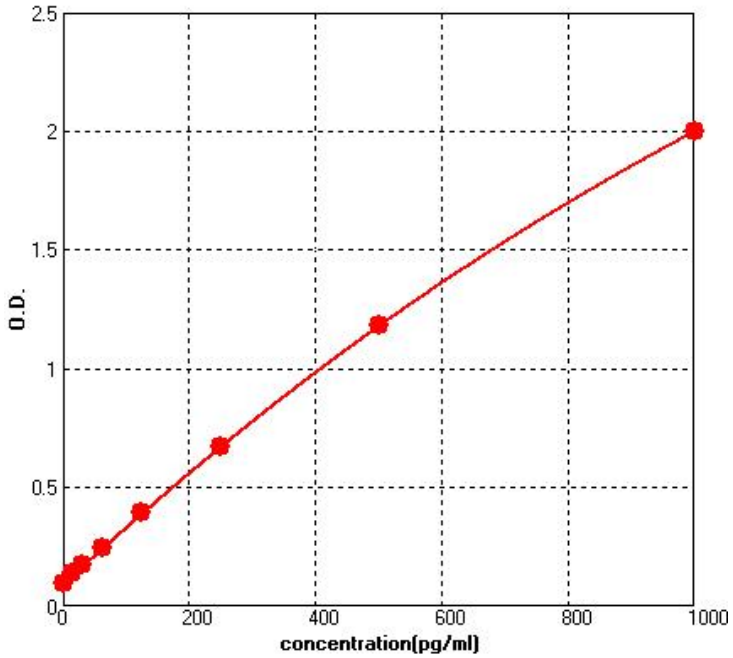
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contact us for replacement.

Typical Data & Standard Curve

Results of a typical standard run of a rat Activin A ELISA Kit are shown below. This standard curve was generated at our lab for demonstration purpose only. Each user should obtain their own standard curve as per experiment. (N/A=not applicable)

X	Pg/ml	0	15.6	31.2	62.5	125	250	500	1000
Y	OD450	0.097	0.138	0.174	0.246	0.391	0.673	1.184	2.002



Reference

1. Archambeault, D. R., Yao, H. H.-C. Activin A, a product of fetal Leydig cells, is a unique paracrine regulator of Sertoli cell proliferation and fetal testis cord expansion. Proc. Nat. Acad. Sci. 107: 10526-10531, 2010.

2. Jones, K. L., Mansell, A., Patella, S., Scott, B. J., Hedger, M. P., de Kretser, D. M., Phillips, D. J. Activin A is a critical component of the inflammatory response, and its binding protein, follistatin, reduces mortality in endotoxemia. Proc. Nat. Acad. Sci. 104: 16239-16244, 2007.

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