Human Prostaglandin E2 ELISA Kit

Instructions for Use | Cat. No.: ARE6653

I. INTRODUCTION

Prostaglandin E2 (PGE2), a principal mediator of inflammation, plays a critical role in cervical ripening. Its biosynthesis in the cervix involves conversion of arachidonic acid to prostaglandin H2 (PGH2) by PGH2 synthase (PTGS2) and conversion of PGH2 to PGE2 by prostaglandin E synthase 2 (PTGES2). In preterm cervix, 15-hydroxyprostaglandin dehydrogenase (HPGD) is highly expressed repressing tissue PGE2 levels by converting PGE2 to inactive 15-keto PGE2. When term approaches, up-regulation of PTGS2 and down-regulation of HPGE concomitantly occur, increasing the local concentration of PGE2 in the cervix. PGE2 has been used as an effective medication to induce cervical ripening and labor.

II. ASSAY PRINCIPLES

AREX Biosciences Prostaglandin E2 ELISA Kit (Competitive Inhibition Enzyme Immunoassay) is a competitive inhibition enzyme immunoassay technique for the in vitro quantitative measurement of Prostaglandin E2 in Serum, Plasma, Tissue Homogenates, Cell Lysates, Cell Culture Supernates or Other Biological Fluids. This assay employs the competitive inhibition enzyme immunoassay technique. A monoclonal antibody specific to Prostaglandin E2 has been pre-coated onto a microplate. A competitive inhibition reaction is launched between biotin labeled Prostaglandin E2 and unlabeled Prostaglandin E2 (standards or samples) with the pre-coated antibody specific to Prostaglandin E2. After incubation the unbound conjugate is washed off. Next, Avidin conjugated to Horseradish Peroxidase (HRP) is added to each microplate well and incubated. The amount of bound HRP conjugate is reverse proportional to the concentration of Prostaglandin E2 in the sample. After addition of the substrate solution, the intensity of color developed is reverse proportional to the concentration of Prostaglandin E2 in the sample.

III. KIT COMPONENTS

Component	Volume
96-well Plate Pre-coated with Anti-Prostaglandin E2 Antibody	8 wells x 12 Strips
Prostaglandin E2 Standard	0.3 ng x 2
Biotin-Labeled Competitive Inhibitor (100X)	60 µl
Streptavidin-HRP (100X)	120 µl
Standard/Sample Diluent	30 ml
Biotin-Labeled Competitive Inhibitor Diluent	12 ml
Streptavidin-HRP Diluent	12 ml
Wash Buffer (20X)	30 ml
TMB Substrate Solution	12 ml
Stop Solution	12 ml
Plate Adhesive Strips	3 Strips
Technical Manual	1 Manual

IV. STORAGE AND STABILITY

All kit components are stable at 2 to 8 °C. Standard (recombinant protein) should be stored at -20 °C or -80 °C (recommended at -80 °C) after reconstitution. Opened Microplate Wells or reagents may be store for up to 1 month at 2 to 8 °C. Return unused wells to the pouch containing desiccant pack, reseal along entire edge.

Note: the kit can be used within one year if the whole kit is stored at -20 °C. Avoid repeated freeze-thaw cycles.

V. MATERIALS REQUIRED BUT NOT PROVIDED

1. Microplate reader capable of measuring absorbance at 450 nm.
2. Adjustable pipettes and pipette tips to deliver 2 µl to 1 ml volumes.
3. Adjustable 1-25 ml pipettes for reagent preparation.
4. 100 ml and 1 liter graduated cylinders.
5. Absorbent paper.
6. Distilled or deionized water.
7. Computer and software for ELISA data analysis.
8. Tubes to prepare standard or sample dilutions.

VI. HEALTH AND SAFETY PRECAUTIONS

1. Reagents provided in this kit may be harmful if ingested, inhaled or absorbed through the skin. Please carefully review the MSDS for each reagent before conducting the experiment.

2. Stop Solution contains 2 N Sulfuric Acid (H2SO4) and is an extremely corrosive agent. Please wear proper eye, hand and face protection when handling this material. When the experiment is finished, be sure to rinse the plate with copious amounts of running water to dilute the Stop Solution prior to disposing the plate.

VII. REAGENT PREPARATION

1. Sample Preparation

Store samples to be assayed within 24 hours at 2-8°C. For long-term storage, aliquot and freeze samples at -20°C. Avoid repeated freeze-thaw cycles.

Cell culture supernates: Remove particulates by centrifugation, assay immediately or aliquot and store samples at -20°C.

Serum: Allow the serum to clot in a serum separator tube (about 4 hours) at room temperature. Centrifuge at approximately 1000 X g for 15 minutes. Analyze the serum immediately or aliquot and store samples at -20°C.

Plasma: Collect plasma using heparin or EDTA as an anticoagulant. Centrifuge for 15 minutes at 1500 X g within 30 minutes of collection. Assay immediately or aliquot and store samples at -20°C.

Cell Lysates: Collect cells and rinse cells with PBS. Homogenize and lyse cells throughly in lysate solution. Centrifuge cell lysates at approximately 10000 X g for 5 minutes to remove debris. Aliquots of the cell lysates were removed and assayed.

Bone Tissue: Extract demineralized bone samples in 4 M Guanidine-HCl and protease inhibitors. Dissolve the final sample in 2 M Guanidine-HCl.

Tissue Homogenates: Rinse tissue with PBS to remove excess blood, chopped into 1-2 mm pieces, and homogenize with a tissue homogenizer in PBS or in lysate solution, lysate solution: tissue net weight = 10ml : 1g (i.e. Add 10ml lysate solution to 1g tissue). Centrifuge at approximately 5000 X g for 5 minutes. Assay immediately or aliquot and store homogenates at -20°C. Avoid repeated freeze-thaw cycles.

Urine: Urinary samples should be cleared by centrifugation and then can be used directly without dilution. Storage at -20°C.

2. Standard Preparation

Reconstitute the lyophilized Prostaglandin E2 Standard by adding 1 ml of Standard/Sample Diluent to make the 300 pg/ml standard stock solution. Allow solution to sit at room temperature for 5 minutes, then gently vortex to mix completely. Use within one hour of reconstituting. Two tubes of the standard (0.3 ng per tube) are included in each kit. Use one tube for each experiment.

Perform 2-fold serial dilutions of the top standards to make the standard curve within the range of this assay (4.68 pg/ml - 300 pg/ml) as below. Standard/Sample Dilution Buffer serves as the zero standard (0 ng/ml).

Standard	Add	Into
300 pg/ml	-	-
150 pg/ml	500 µl of the Standard (300 pg/ml)	500 µl of the Standard/Sample Diluent
75 pg/ml	500 µl of the Standard (150 pg/ml)	500 µl of the Standard/Sample Diluent
37.5 pg/ml	500 µl of the Standard (75 pg/ml)	500 µl of the Standard/Sample Diluent
18.7 pg/ml	500 µl of the Standard (37.5 pg/ml)	500 µl of the Standard/Sample Diluent
9.37 pg/ml	500 µl of the Standard (18.7 pg/ml)	500 µl of the Standard/Sample Diluent
4.68 pg/ml	500 µl of the Standard (9.37 pg/ml)	500 µl of the Standard/Sample Diluent
0 pg/ml	1 ml of the Standard/Sample Diluent	-

Note: The standard solutions are best used within 2 hours. The 300 pg/ml standard solution should be stored at 4°C for up to 12 hours, or at -20°C for up to 48 hours. Avoid repeated freeze-thaw cycles.

3. Biotin-Labeled Competitive Inhibitor Working Solution Preparation

The Biotin-Labeled Competitive Inhibitor should be diluted in 1:100 with the Biotin-Labeled Competitive Inhibitor Diluent and mixed thoroughly. The solution should be prepared no more than 2 hours prior to the experiment.

4. Streptavidin-HRP Working Solution Preparation

The Streptavidin-HRP should be diluted in 1:100 with the Streptavidin-HRP Diluent and mixed thoroughly. The solution should be prepared no more than 1 hour prior to the experiment.

5. Wash Buffer Working Solution Preparation

Pour entire contents (30 ml) of the Wash Buffer Concentrate into a clean 1,000 ml graduated cylinder. Bring final volume to 600 ml with glass-distilled or deionized water (1:20).

VIII. ASSAY PROCEDURE

The Streptavidin-HRP Working Solution and TMB Substrate Solution must be kept warm at 37°C for 30 minutes before use. When diluting samples and reagents, they must be mixed completely and evenly. Standard detection curve should be prepared for each experiment. The user will decide sample dilution fold by crude estimation of protein amount in samples.

1. Prepare 7 wells for standard, 1 well for blank. Add 50 µl of each standard and samples into appropriate wells. Then add 50 µl of Biotin-Labeled Competitive Inhibitor Working Solution to each well immediately.

2. Cover well and incubate for 60 minutes at room temperature with gentle shaking (using a microplate shaker is recommended).

3. Remove the cover, discard the solution and wash plate 3 times with Wash Buffer Working Solution, and each time let Wash Buffer Working Solution stay in the wells for 1 - 2 minutes. Blot the plate onto paper towels or other absorbent material. Do NOT let the wells completely dry at any time.

4. Add 100 µl of Streptavidin-HRP Working Solution into each well and incubate the plate at 37°C for 45 minutes.

5. Wash plate 5 times with Wash Buffer Working Solution, and each time let wash buffer stay in the wells for 1 - 2 minutes. Discard the wash buffer and blot the plate onto paper towels or other absorbent material.

6. Add 100 µl of TMB Substrate Solution into each well and incubate plate at 37°C in dark for 10 - 20 minutes.

7. Add 100 µl of Stop Solution into each well. The color changes into yellow immediately.

8. Read the O.D. absorbance at 450nm in a microplate reader within 30 minutes 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 concentration of the samples can be interpolated from the standard curve.

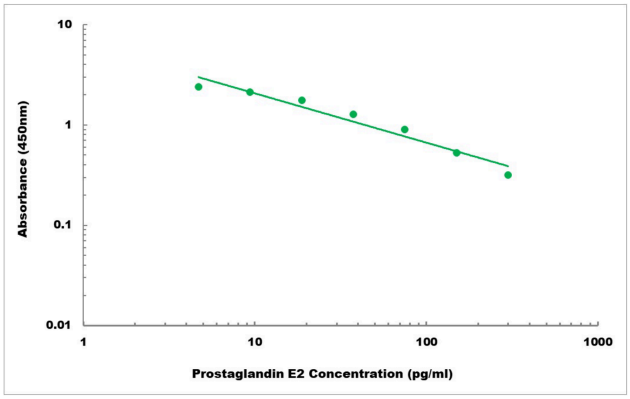
Note: If the samples measured were diluted, multiply the dilution factor to the concentrations from interpolation to obtain the concentration before dilution.

IX. ASSAY PROCEDURE SUMMARY

1. Prepare 7 wells for standard, 1 well for blank
2. Add 50 µl Standard or Sample, then 50 µl Biotin-Labeled Competitive Inhibitor
3. Incubate 60 minutes at room temperature with gentle shaking
4. Wash plate 3 times with Wash Buffer Working Solution
5. Add 100 µl Streptavidin-HRP Working Solution, incubate 45 minutes at 37°C
6. Wash plate 5 times with Wash Buffer Working Solution
7. Add 100 µl TMB Substrate Solution, incubate 10 - 20 minutes at 37°C in dark
8. Add 100 µl Stop Solution and read the plate at 450nm

X. TYPICAL DATA

The standard curve is for demonstration only. A standard curve must be run with each assay.



XI. SENSITIVITY

The minimum detectable dose of Prostaglandin E2 is typically less than 1.36 pg/ml.

XII. SPECIFICITY

Prostaglandin E2 ELISA Kit has high sensitivity and excellent specificity for detection of Prostaglandin E2.

The detection range is 4.68 pg/ml - 300 pg/ml.

XIII. CROSS REACTIVITY

No significant cross-reactivity or interference between Prostaglandin E2 and analogues was observed.

XIV. TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
High signal and background in all wells	Insufficient washing Too much Streptavidin-HRP Incubation time too long Development time too long	Increase number of washes Increase time of soaking between in wash Check dilution, titration Reduce incubation time Decrease the incubation time before the stop solution is added
No signal	Reagent added in incorrect order, or incorrectly prepared Standard has gone bad (If there is a signal in the sample wells) Assay was conducted from an incorrect starting point	Review protocol Check the condition of stored standard Reagents allows to come to 20 - 30 °C before performing assay
Too much signal-whole plate turned uniformly blue	Insufficient washing-unbound Streptavidin-HRP remaining Too much Streptavidin-HRP Plate sealer or reservoir reused, resulting in presence of residual Streptavidin-HRP	Increase number of washes Carefully Check dilution Use fresh plate sealer and reagent reservoir for each step
Standard curve achieved but poor discrimination between point	Plate not developed long enough Improper calculation of standard curve dilution	Increase substrate solution incubation time Check dilution, make new standard curve
No signal when a signal is expected, but standard curve looks fine	Sample matrix is masking detection	More diluted sample Recommended
Samples are reading too high, but standard curve is fine	Samples contain protein levels above assay range	Dilute samples and run Again
Edge effect	Uneven temperature around work surface	Avoid incubating plate in areas where environmental conditions vary Use plate sealer

XV. TECHNICAL SUPPORT

For troubleshooting, information or assistance, please contact us at info@arexbio.com.

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XVI. NOTES

For research use only. Not for diagnostic or therapeutic procedures.