

Human Vitamin D BP ELISA Kit

[Catalog No] EK1145

[SIZE] 48T/96T

[INTENDED USE] For the quantitative determination of human Vitamin D Binding Protein (Vitamin D BP) concentrations in cell culture supernates, serum and plasma.

[INTRODUCTION]

Vitamin D-binding protein (Vitamin D BP), also known as gc-globulin (group-specific component) belongs to the albumin gene family, together with human serum albumin and alpha-fetoprotein. It is a multifunctional protein found in plasma, ascitic fluid, cerebrospinal fluid and on the surface of many cell types. It binds to vitamin D and its plasma metabolites and transports them to target tissues. As Gc protein-derived macrophage activating factor it is a Macrophage Activating Factor (MAF) that has been tested for use as a cancer treatment that would activate macrophages against cancer cells.

[PRINCIPLE OF THE ASSAY]

This assay employs the quantitative sandwich enzyme immunoassay technique. A monoclonal antibody specific for human Vitamin D BP has been pre-coated onto a microplate. Standard, samples and biotin-linked detect antibody specific for Vitamin D BP are pipetted into the wells and Vitamin D BP present is bound by the immobilized antibody and detect antibody following incubation. After washing away any unbound substances, streptavidin-HRP is added. After washing, substrate solution is added to the wells and color develops in proportion to the amount of Vitamin D BP bound in the initial step. The color development is stopped and the intensity of the color is measured.

[MATERIALS PROVIDED]

| PART | PART # | EK1145-48 | EK1145-96 |
|----------------------|---------|-----------|-----------|
| Coated Microplate | EK1145P | 48T | 96T |
| Standard | EK1145S | 1 vial | 2 vials |
| Detect antibody | EK1145D | 1 vial | 1 vial |
| Streptavidin-HRP | E0290 | 1 vial | 1 vial |
| Assay Buffer (10×) | E0310 | 20ml | 20ml |
| TMB | E0230 | 6ml | 11ml |
| Stop Solution | E0300 | 11ml | 11ml |
| Washing Buffer (20×) | E0281 | 50ml | 50ml |
| Adhesive Film | E0200 | 6 | 6 |

Note: Components from reagent kits of different batch numbers must not be used interchangeably.

OTHER SUPPLIES REQUIRED

- 1) Microplate reader capable of measuring absorbance at 450 nm, with correction wavelength set at 570 nm or 630 nm.
- 2) Pipettes and pipette tips.
- 3) 50 µl to 300 µl adjustable multichannel micropipette with disposable tips.
- 4) Multichannel micropipette reservoir.
- 5) Beakers, flasks, cylinders necessary for preparation of reagents.
- 6) Deionized or distilled water.
- 7) Polypropylene test tubes for dilution.

[STORAGE]

Store at 2-8°C; refer to the kit label for expiration date.

For opened kits:

Pre-coated microplate: Can be stored at 2-8°C for approximately 1 month (return unused strips to the aluminum foil bag and reseal).

Standard: Can be stored at -20°C for approximately 1 month (discard after single-use reconstitution).

Other components: Can be stored at 2-8°C for approximately 1 month.

[SAMPLE COLLECTION AND STORAGE]

- 1) **Cell Culture Supernates** – Remove particulates by centrifugation and assay freshly prepared samples immediately or aliquot and store samples at ≤ -20°C for later use. Avoid repeated freeze-thaw cycles.
- 2) **Serum** – Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 10 minutes at 1,000 × g. Remove serum and assay freshly prepared samples immediately or aliquot and store samples at ≤ -20°C for later use. Avoid repeated freeze-thaw cycles.
- 3) **Plasma** – Collect plasma using EDTA, citrate or heparin as anticoagulant. Centrifuge at 1,000 × g within 30 minutes of collection. Assay freshly prepared samples immediately or aliquot and store samples at ≤ -20°C for later use. Avoid repeated freeze-thaw cycles.
- 4) Other biological samples might be suitable for use in the assay. Cell culture supernates, serum and plasma were tested with this assay. Dilution with Assay Buffer may be needed.

Note: Samples containing a visible precipitate must be clarified prior to use in the assay. Do not use grossly hemolyzed or lipemic specimens.

If samples are to be run within 24 hours, they may be stored at 2 to 8°C. For longer storage, aliquot samples and store frozen at -20°C. Avoid repeated freeze-thaw cycles.

[SAMPLE PREPARATION]

Normal serum and plasma samples require a 40,000-fold dilution. A suggested 10,000-fold dilution is two-step dilution: first, 5 µl sample + 995 µl Assay Buffer (1×); next, 5 µl Mix I + 995 µl Assay Buffer (1×).

[REAGENT PREPARATION]

Bring all reagents and samples to room temperature before use.

If crystals form in the Buffer Concentrates, warm and gently stir them until completely dissolved.

Washing Buffer (1×)

Pour entire contents (50 ml) of the **Washing Buffer (20×)** into a clean 1,000 ml graduated cylinder. Bring to final volume of 1,000 ml with pure or deionized water.

Mix gently to avoid foaming.

Transfer to a clean wash bottle and store at 2 to 25°C. Washing Buffer (1×) is stable for 30 days.

Assay Buffer (1×)

Pour the entire contents (5 ml) of the **Assay Buffer (10×)** into a clean 100 ml graduated cylinder. Bring to final volume of 50 ml with distilled water. Mix gently to avoid foaming.

Store at 2 to 8°C. Assay Buffer (1×) is stable for 30 days.

Detect Antibody

Mix well prior to making dilutions.

Make a **1: 100** dilution of the concentrated **Detect Antibody** solution with Assay Buffer (1×) in a clean plastic tube.

The diluted Detect Antibody should be used within 30 minutes after dilution.

Streptavidin-HRP

Mix well prior to making dilutions.

Make a **1: 100** dilution of the concentrated **Streptavidin-HRP** solution with Assay Buffer (1×) in a clean plastic tube as needed.

The diluted Streptavidin-HRP should be used within 30 minutes after dilution.

Sample Dilution: If your samples have high **Vitamin D BP** content, dilute serum/plasma samples with Assay Buffer (1×). For cell culture

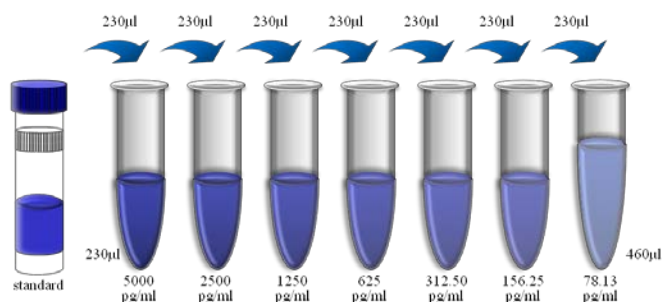
supernates, dilute with cell culture medium.

Human Vitamin D BP Standard: Reconstitute **Human Vitamin D BP Standard** by addition of distilled water. Reconstitution volume is stated on the label of the standard vial. Swirl or mix gently to insure complete and homogeneous solubilization (concentration of reconstituted standard = 10,000 pg/ml).

Allow the standard to reconstitute for 10 - 30 minutes. Mix well prior to making dilutions.

Use polypropylene tubes.

- **For serum/plasma samples**, mixing concentrated human Vitamin D BP standard (230 μ l) with 230 μ l of Assay Buffer (1 \times) creates the high standard (5,000 pg/ml). Pipette 230 μ l of Assay Buffer (1 \times) into each tube. Use the high standard to produce a 1:1 dilution series (scheme below). Mix each tube thoroughly before the next transfer. Assay Buffer (1 \times) serves as the zero standard (0 pg/ml).
- **For cell culture supernates**, mixing concentrated human Vitamin D BP standard (230 μ l) with 230 μ l of cell culture medium creates the high standard (5,000 pg/ml). Pipette 230 μ l of cell culture medium into each tube. Use the high standard to produce a 1:1 dilution series. Mix each tube thoroughly before the next transfer. Cell culture medium serves as the zero standard (0 pg/ml).



[ASSAY PROCEDURE]

Bring all reagents and samples to room temperature before use.

- 1) Prepare all reagents including microplate, samples, standards and working solution as described in the previous sections.
- 2) Remove excess microplate strips and return them to the foil pouch containing the desiccant pack, and reseal for further use.
- 3) Add 300 μ l Washing Buffer (1 \times) per well, and allow it for about 30 seconds before aspiration. Soaking is highly recommended to obtain a good test performance. Empty wells and tap microwell strips on absorbent pad or paper towel to remove excess Washing Buffer (1 \times). Use the microwell strips immediately after washing. **Do not allow wells to dry.**
- 4) Add 100 μ l 2-fold diluted Standard to Standard well. Add 100 μ l Assay Buffer (1 \times)/ culture medium to Blank well.
- 5) **Serum/Plasma:** Add 90 μ l Assay Buffer (1 \times) and 10 μ l of prediluted sample to the sample well. **Cell culture supernates:** Add 100 μ l cell culture supernates to the sample well.
- 6) Add 50 μ l of diluted Detect Antibody to each well. Ensure reagent addition in step 4, 5 and 6 is uninterrupted and completed within 15 minutes.
- 7) **Seal the plate with an adhesive film.** Incubate at room temperature (25°C \pm 3°C) for 2 hours on a microplate shaker set at 300 rpm.
- 8) Aspirate each well and wash by filling each well with 300 μ l Washing Buffer (1 \times), repeat five times for a total six washes. Complete removal of liquid at each step is essential to the best performance. After the last wash, remove any remaining Washing Buffer (1 \times) by aspirating or decanting. Invert the plate and tap it against clean paper towels.
- 9) Add 100 μ l of diluted Streptavidin-HRP to each well.

10) **Seal the plate with a fresh adhesive film.** Incubate at room temperature (25°C \pm 3°C) for 45 minutes on a microplate shaker set at 300 rpm.

11) Repeat aspiration/wash as in step 8.

12) Add 100 μ l of Substrate Solution to each well. Incubate for 5 - 30 minutes at room temperature (25°C \pm 3°C). **Protect from light.**

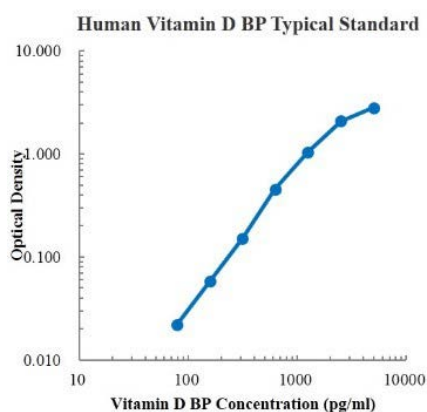
13) Add 100 μ l of Stop Solution to each well. The color will turn yellow. If the color in the well is green or if the color change does not appear uniform, gently tap the plate to ensure thorough mixing.

14) Measure the optical density value within 30 minutes by microplate reader set to 450 nm. If wavelength correction is available, set to 570 nm or 630 nm. If wavelength correction is not available, subtract readings at 570 nm or 630 nm from the readings at 450 nm. This subtraction will correct for optical imperfections in the plate. Reading directly at 450 nm without correction may generate higher concentration than true value.

[TYPICAL DATA]

A standard curve must be run within each assay. The following standard curve is provided for demonstration only.

| pg/ml | O.D. | Average | Corrected |
|---------|-------|---------|-----------|
| 0.00 | 0.027 | 0.030 | 0.029 |
| 78.13 | 0.053 | 0.048 | 0.051 |
| 156.25 | 0.089 | 0.084 | 0.087 |
| 312.50 | 0.178 | 0.183 | 0.181 |
| 625.00 | 0.488 | 0.478 | 0.483 |
| 1250.00 | 1.080 | 1.070 | 1.075 |
| 2500.00 | 2.043 | 2.167 | 2.105 |
| 5000.00 | 2.866 | 2.789 | 2.828 |
| | | 2.828 | 2.799 |



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