PicoKine™ ELISA

Catalog number: EK0515

For the quantitation of Mouse Tgfb1 concentrations in cell culture supernates, serum, plasma(EDTA) and urine.

This package insert must be read in its entirety before using this product. For research use only. Not for use in diagnostic procedures.
Mouse TGF Beta 1 PicoKine™ ELISA Kit

Catalog Number: EK0515

Assay Principle

The Boster Picokine™ Mouse Tgfb1 Pre-Coated ELISA (Enzyme-Linked Immunosorbent Assay) kit is a solid phase immunoassay specially designed to measure Mouse Tgfb1 with a 96-well strip plate that is pre-coated with antibody specific for Tgfb1. The detection antibody is a biotinylated antibody specific for Tgfb1. The capture antibody is monoclonal antibody from rat, the detection antibody is polyclonal antibody from goat. The kit contains recombinant Mouse Tgfb1 with immunogen: Expression system for standard: CHO; Immunogen sequence: A279-S390. The kit is analytically validated with ready to use reagents.

To measure Mouse Tgfb1, add standards and samples to the wells, then add the biotinylated detection antibody. Wash the wells with PBS or TBS buffer, and add Avidin-Biotin-Peroxidase Complex (ABC-HRP). Wash away the unbounded ABC-HRP with PBS or TBS buffer and add TMB. TMB is substrate to HRP and will be catalyzed to produce a blue color product, which changes into yellow after adding acidic stop solution. The density of the yellow product is linearly propotional to Mouse Tgfb1 in the sample. Read the density of the yellow product in each well using a plate reader, and benchmark the sample wells' readings against the standard curve to determine the concentration of Mouse Tgfb1 in the sample. For more information on assay principle, protocols, and troubleshooting tips, see Boster's ELISA Resource Center at https://www.bosterbio.com/elisa-technical-resource-center.

Overview

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Mouse TGF Beta 1 PicoKine™ ELISA Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactive Species</td>
<td>Mouse</td>
</tr>
<tr>
<td>Size</td>
<td>96wells/kit, with removable strips.</td>
</tr>
<tr>
<td>Description</td>
<td>Sandwich High Sensitivity ELISA kit for Quantitative Detection of activated Mouse TGF beta 1. 96wells/kit, with removable strips.</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>&lt;2pg/ml</td>
</tr>
<tr>
<td></td>
<td>*The sensitivity or the minimum detectable dose (MDD) is the lower limit of target protein that can be detected by the kit. It is determined by adding two standard deviations to the mean O.D. value of twenty (20) blank wells and calculating the corresponding concentration.</td>
</tr>
<tr>
<td>Detection Range</td>
<td>15.6pg/ml-1000pg/ml</td>
</tr>
<tr>
<td>Storage Instructions</td>
<td>Store at 4°C for 6 months, at -20°C for 12 months. Avoid multiple freeze-thaw cycles(Shipped with wet ice.)</td>
</tr>
<tr>
<td>Uniprot ID</td>
<td>PO4202</td>
</tr>
</tbody>
</table>
Technical Details

<table>
<thead>
<tr>
<th>Capture/Detection Antibodies</th>
<th>The capture antibody is monoclonal antibody from rat, the detection antibody is polyclonal antibody from goat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specificity</td>
<td>Natural and recombinant Mouse Tgfb1</td>
</tr>
<tr>
<td>Immunogen</td>
<td>Expression system for standard: CHO; Immunogen sequence: A279-S390</td>
</tr>
<tr>
<td>Cross Reactivity</td>
<td>There is no detectable cross-reactivity with other relevant proteins.</td>
</tr>
</tbody>
</table>

Kit Components/Materials Provided

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-Mouse Tgfb1 Pre-coated 96-well strip microplate</td>
<td>1</td>
<td>12 strips of 8 wells</td>
</tr>
<tr>
<td>Mouse Tgfb1 Standard</td>
<td>2</td>
<td>10ng/tube</td>
</tr>
<tr>
<td>Mouse Tgfb1 Biotinylated antibody (100x)</td>
<td>1</td>
<td>130 µl</td>
</tr>
<tr>
<td>Avidin-Biotin-Peroxidase Complex (100x)</td>
<td>1</td>
<td>130 µl</td>
</tr>
<tr>
<td>Sample Diluent</td>
<td>1</td>
<td>30ml</td>
</tr>
<tr>
<td>Antibody Diluent</td>
<td>1</td>
<td>12ml</td>
</tr>
<tr>
<td>Avidin-Biotin-Peroxidase Diluent</td>
<td>1</td>
<td>12ml</td>
</tr>
<tr>
<td>Wash Buffer Concentrate (Powder for 1000ml)</td>
<td>1</td>
<td>Pack</td>
</tr>
<tr>
<td>Color Developing Reagent (TMB)</td>
<td>1</td>
<td>10ml</td>
</tr>
<tr>
<td>Stop Solution</td>
<td>1</td>
<td>10ml</td>
</tr>
<tr>
<td>Plate Sealers</td>
<td>4</td>
<td>Piece</td>
</tr>
</tbody>
</table>

Required Materials That Are Not Supplied

- Microplate Reader capable of reading absorbance at 450nm.
- Automated plate washer (optional)
- Pipettes and pipette tips capable of precisely dispensing 0.5 µl through 1 ml volumes of aqueous solutions. Multichannel pipettes are recommended for large amount of samples.
- Deionized or distilled water.
- 500ml graduated cylinders.
- Test tubes for dilution.
Mouse TGF Beta 1 PicoKine™ ELISA Kit (EK0515) Standard Curve Example

Highest O.D. value might be higher or lower than in the example. The experiment result is statistically significant if the highest O.D. value is no less than 1.0.

<table>
<thead>
<tr>
<th>Concentration(pg/ml)</th>
<th>0</th>
<th>15.6</th>
<th>31.2</th>
<th>62.5</th>
<th>125</th>
<th>250</th>
<th>500</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>O.D.</td>
<td>0.041</td>
<td>0.131</td>
<td>0.214</td>
<td>0.365</td>
<td>0.627</td>
<td>1.068</td>
<td>1.624</td>
<td>2.298</td>
</tr>
</tbody>
</table>

Mouse TGF beta 1 PicoKine ELISA Kit standard curve

A standard curve is provided for demonstration only. A standard curve should be generated for each set of samples assayed.

Intra/Inter Assay Variability

Boster spend great efforts in documenting lot to lot variability and make sure our assay kits produce robust data that are reproducible.

**Intra-Assay Precision (Precision within an assay):** Three samples of known concentration were tested on one plate to assess intra-assay precision.

**Inter-Assay Precision (Precision accross assays):** Three samples of known concentration were tested in separate assays to assess inter-assay precision.

<table>
<thead>
<tr>
<th>Sample</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>24</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Mean(pg/ml)</td>
<td>114</td>
<td>240</td>
<td>483</td>
<td>125</td>
<td>248</td>
<td>515</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>5.47</td>
<td>12</td>
<td>17.9</td>
<td>6.75</td>
<td>15.4</td>
<td>30.4</td>
</tr>
<tr>
<td>CV(%)</td>
<td>4.8</td>
<td>5</td>
<td>3.7</td>
<td>5.4</td>
<td>6.2</td>
<td>5.9</td>
</tr>
</tbody>
</table>
**Preparation Before The Experiment**

<table>
<thead>
<tr>
<th>Item</th>
<th>Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>All reagents</td>
<td>Bring all reagents to 37°C prior to use. The assay can also be done at room temperature however we recommend doing it at 37°C for best consistency with our QC results. Also the TMB incubation time estimate (25-30min) is based on 37°C.</td>
</tr>
<tr>
<td>Wash buffer</td>
<td>Dissolve the included powder in 1000ml of deionized water. Excess wash buffer can be stored for up to one week at 4°C.</td>
</tr>
<tr>
<td>Biotinylated Anti-Mouse Tgfb1 antibody</td>
<td>It is recommended to prepare this reagent immediately prior to use by diluting the Mouse Tgfb1 Biotinylated antibody (100x) 1:100 with Antibody Diluent. Prepare 100 µl by adding 1 µl of Biotinylated antibody (100x) to 99 µl of Antibody Diluent for each well. Mix gently and thoroughly and use within 2 hours of generation.</td>
</tr>
<tr>
<td>Avidin-Biotin-Peroxidase Complex</td>
<td>It is recommended to prepare this reagent immediately prior to use by diluting the Avidin-Biotin-Peroxidase Complex (100x) 1:100 with Avidin-Biotin-Peroxidase Diluent. Prepare 100 µl by adding 1 µl of Avidin-Biotin-Peroxidase Complex (100x) to 99 µl of Avidin-Biotin-Peroxidase Diluent for each well. Mix gently and thoroughly and use within 2 hours of generation.</td>
</tr>
<tr>
<td>Mouse Tgfb1 Standard</td>
<td>It is recommended that the standards be prepared no more than 2 hours prior to performing the experiment. Use one 10ng of lyophilized Mouse Tgfb1 standard for each experiment. Gently spin the vial prior to use. Reconstitute the standard to a stock concentration of 10ng/ml using 1ml of sample diluent. Allow the standard to sit for a minimum of 10 minutes with gentle agitation prior to making dilutions.</td>
</tr>
<tr>
<td>Microplate</td>
<td>The included microplate is coated with capture antibodies and ready-to-use. It does not require additional washing or blocking. The unused well strips should be sealed and stored in the original packaging.</td>
</tr>
</tbody>
</table>

**Dilution of Mouse Tgfb1 Standard**

1. Number tubes 1-8. Final Concentrations to be Tube # 1 – 1000pg/ml, #2 – 500pg/ml, #3 – 250pg/ml, #4 – 125pg/ml, #5 – 62.5pg/ml, #6 – 31.25pg/ml, #7 – 15.625pg/ml, #8 – 0.0 (Blank).
2. To generate standard #1, add 100µl of the reconstituted standard stock solution of 10ng/ml and 900µl of sample diluent to tube #1 for a final volume of 1000µl. Mix thoroughly.
3. Add 300 µl of sample diluent to tubes # 2-7.
4. To generate standard #2, add 300 µl of standard #1 from tube #1 to tube #2 for a final volume of 600 µl. Mix thoroughly.
5. To generate standard #3, add 300 µl of standard #2 from tube #2 to tube #3 for a final volume of 600 µl. Mix thoroughly.
6. Continue the serial dilution for tube #4-7.
7. Tube #8 is a blank standard to be used with every experiment.
Sample Preparation and Storage

These sample collection instructions and storage conditions are intended as a general guideline and the sample stability has not been evaluated.

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell culture supernatants</td>
<td>Clear sample of particulates by centrifugation, assay immediately or store samples at -20°C.</td>
</tr>
<tr>
<td>Serum</td>
<td>Use a serum separator tube (SST) and allow serum to clot at room temperature for about four hours. Then, centrifuge for 15 min at approximately 1,000 x g. assay immediately or store samples at -20°C.</td>
</tr>
<tr>
<td>Plasma</td>
<td>Collect plasma using EDTA as an anticoagulant. Centrifuge for 15 min at approximately 1,000 x g. Assay immediately or store samples at -20°C. *Note: it is important to not use anticoagulants other than the ones described above to treat plasma for other anticoagulants could block the antibody binding site.</td>
</tr>
<tr>
<td>Urine</td>
<td>Collect the first urine of the day, micturate directly into a sterile container. Remove impurities by centrifugation, assay immediately or aliquot and store samples at -20°C.</td>
</tr>
</tbody>
</table>

*Note: To detect Tgfb1 in samples, you need to activate Tgfb1 in samples prior to the assay.

TGF beta 1 is mostly contained as inactive form in samples, please activate it before assay. Don't activate recombinant TGF beta 1.

Solution A: 1N HCl: add 8.33ml of 12N HCl into 91.67ml of H₂O.

Solution B: 1.2N NaOH/0.5M HEPES: add 12ml of 10N NaOH and 11.9g HEPES into 75ml of H₂O, add H₂O to adjust volume to 100ml.

Activate the sample

Cell culture supernate, urine: add activating reagent pro rata, i.e. add 20μl of Solution A into 100μl of sample, 10 min later, add 20μl of Solution B. PH 7.0-7.6.

Serum, plasma(EDTA): add activating reagent pro rata, i.e. add 20μl of Solution A into 40μl of sample, 10 min later, add 20μl of Solution B. PH 7.0-7.6.

It is unnecessary to activate the recombinant TGFβ 1.

Sample was diluted partly after adding activating reagent, so please pay attention to this when calculate target protein concentration.

Sample Dilution

The target protein concentration should be estimated and appropriate sample dilutions should be selected such that the final protein concentration lies near the middle of the linear dynamic range of the assay.
It is recommended to prepare 150 µl of sample for each replicate to be assayed. The samples should be diluted with sample diluent and mixed gently.

**Assay protocol**

It is recommended that all reagents and materials be equilibrated to 37°C/room temperature prior to the experiment (see Preparation Before The Experiment if you have missed this information).

1. Prepare all reagents and working standards as directed previously.
2. Remove excess microplate strips from the plate frame and seal and store them in the original packaging.
3. Add 100 µl of the standard, samples, or control per well. At least two replicates of each standard, sample, or control is recommended.
4. Cover with the plate sealer provided and incubate for 120 minutes at RT (or 90 min. at 37 °C).
5. Remove the cover and discard the liquid in the wells into an appropriate waste receptacle. Invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
6. Add 100 µl of the prepared 1x Biotinylated Anti-Mouse Tgfb1 antibody to each well.
7. Cover with plate sealer and incubate for 90 minutes at RT (or 60 minutes at 37°C).
8. Wash the plate 3 times with the 1x wash buffer.
   a. Discard the liquid in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
   b. Add 300 µl of the 1x wash buffer to each assay well. (For cleaner background incubate for 60 seconds between each wash).
   c. Repeat steps a-b 2 additional times.
9. Add 100 µl of the prepared 1x Avidin-Biotin-Peroxidase Complex into each well and incubate for 40 minutes at RT (or 30 minutes at 37°C).
10. Wash the plate 5 times with the 1x wash buffer.
    a. Discard the liquid in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
    b. Add 300 µl of the 1x wash buffer to each assay well. (For cleaner background incubate for 60 seconds between each wash).
    c. Repeat steps a-b 4 additional times.
11. Add 90 µl of Color Developing Reagent to each well and incubate in the dark for 30 minutes at RT (or 25-30 minutes at 37°C). (The optimal incubation time must be empirically determined. A guideline to look for is blue shading the top four standard wells, while the remaining standards remain clear.)
12. Add 100 µl of Stop Solution to each well. The color should immediately change to yellow.
13. Within 30 minutes of stopping the reaction, the O.D. absorbance should be read with a microplate reader at 450nm.

**Data Analysis**

Average the duplicate readings for each standard, sample, and control. Subtract the average zero standard O.D. reading.

It is recommended that a standard curve be created using computer software to generate a four parameter logistic (4-PL) curve-fit. A free program capable of generating a four parameter logistic (4-PL) curve-fit can be found online at: www.myassays.com/four-parameter-logistic-curve.assay.

Alternatively, plot the mean absorbance for each standard against the concentration. The measured concentration in the sample can be
interpolated by using linear regression of each average relative OD against the standard curve generated using curve fitting software. This will generate an adequate but less precise fit of the data.

For diluted samples, the concentration reading from the standard curve must be multiplied by the dilution factor.

**Background on Tgfb1**

Transforming growth factor-beta1 (TGF-beta1) is a multifunctional peptide that controls proliferation, differentiation, and other functions in many cell types. Many cells synthesize TGF-beta and essentially all of them have specific receptors for this peptide. TGF-beta regulates the actions of many other peptide growth factors and determines a positive or negative direction of their effects. TGFbeta1 is known for its potent and diverse biological effects, including immune regulation, and cell growth and differentiation. TGFbeta1 is also an important mediator of bone remodeling. TGFbeta1, a potent keratinocyte growth inhibitor, has been shown to be overexpressed in keratinocytes in certain inflammatory skin diseases and has been thought to counteract the effects of other growth factors at the site of inflammation. TGF-beta1, a multifunctional cytokine with fibrogenic properties, has been implicated in the pathogenesis of the vascular and target organ complications of hypertension. TGF-beta1 may also regulate blood pressure via stimulation of endothelin-1 and/or renin secretion. TGFbeta1 is secreted as a latent form, which consists of its mature form and a latency-associated peptide (beta1-LAP) in either the presence or the absence of additional latent TGF-beta1-binding protein. The standard product used in this kit is recombinant TGFbeta1 with the molecular mass of 25KDa.