Human ENG ELISA Kit

Cat#: orb546924 (ELISA Manual)

Assay Principle

The Biorbyt Human ENG Pre-Coated ELISA (Enzyme-Linked Immunosorbent Assay) kit is a solid phase immunoassay specially designed to measure Human ENG with a 96-well strip plate that is pre-coated with antibody specific for ENG. The detection antibody is a biotinylated antibody specific for ENG. The capture antibody is monoclonal antibody from mouse and the detection antibody is polyclonal antibody from goat. The kit contains recombinant Human ENG with immunogen: Expression system for standard: CHO; Immunogen sequence: E26-G586. The kit is analytically validated with ready to use reagents.
To measure Human ENG, 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 Human ENG 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 Human ENG in the sample.

Overview

Product Name Human Endoglin/CD105/ENG Quick ELISA Kit
Reactive Species Human
Size 96 wells/kit, with removable strips.
Description Human CD105 Quick ELISA Kit (90 minutes, 96 Tests). Quantitate Human ENG in cell culture supernatants, cell lysates, serum and plasma (heparin, EDTA). Sensitivity: 15pg/ml.
Sensitivity <15 pg/ml
*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.
Detection Range 156 pg/ml - 10,000 pg/ml
Storage Instructions Store at 4°C for 6 months, at -20°C for 12 months. Avoid multiple freeze-thaw cycles (Ships with gel ice, can store for up to 3 days in room temperature. Freeze upon receiving.)
Uniprot ID P17813

Technical Details

Capture/Detection Antibodies
The capture antibody is monoclonal antibody from mouse and the detection antibody is polyclonal antibody from goat.

Specificity
Natural and recombinant Human ENG

Immunogen
Expression system for standard: CHO; Immunogen sequence: E26-G586

Cross Reactivity
There is no detectable cross-reactivity with other relevant proteins.

Kit Components/Materials Provided

Description	Quantity	Volume
Anti-Human ENG Pre-coated 96-well strip microplate	1	12 strips of 8 wells
Human ENG Standard	2	10 ng/tube
Human ENG Biotinylated antibody (50x)	1	100 µl
Avidin-Biotin-Peroxidase Complex (30x)	1	400 µl
Sample Diluent	1	30 ml
Antibody Diluent	1	12 ml
Avidin-Biotin-Peroxidase Diluent	1	12 ml
Wash Buffer (25x)	1	20 ml
Color Developing Reagent (TMB)	1	10 ml
Stop Solution	1	10 ml
Plate Sealers	4	Piece

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.

Notice Before Application

Please read the following instructions before starting the experiment.
1. To inspect the validity of experiment operation and the appropriateness of sample dilution proportion, pilot experiment using standards and a small number of samples is recommended.

2. Before using the Kit, spin tubes and bring down all components to the bottom of tubes.
3. Don't let 96-well plate dry, for dry plate will inactivate active components on plate.
4. Don't reuse tips and tubes to avoid cross contamination.
5. Avoid using the reagents from different batches together.

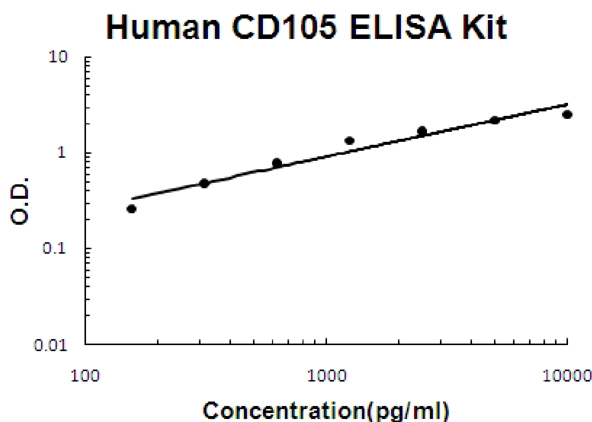
Human Endoglin/CD105/ENG Quick ELISA Kit (FEK0644) Standard Curve Example

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.

Concentration (pg/ml)	0	156	312	625	125000	25000	5000	10000
O.D.	0.011	0.258	0.471	0.766	1.312	1.658	2.122	2.480

Human CD105 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

Biorbyt 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.

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	Intra-Assay Precision			Inter-Assay Precision		
Sample	1	2	3	1	2	3
n	16	16	16	24	24	24
Mean (pg/ml)	312	1384	4821	316	1275	4955
Standard deviation	16.22	74.73	318.18	17.38	72.67	386.49
CV (%)	5.2%	5.4%	6.6%	5.5%	5.7%	7.8%

Reproducibility

We ensure reproducibility by testing three samples with differing concentrations of Bdnf in ELISA kits from four different production batches/lots.

Lots	Lot 1 (pg/ml)	Lot 2 (pg/ml)	Lot 3 (pg/ml)	Lot 4 (pg/ml)	Mean (pg/ml)	Standard Deviation	CV (%)
Sample 1	312	285	280	306	295	13.53	4.5%
Sample 2	1384	1301	1412	1238	1333	68.71	5.1%
Sample 3	4821	5271	4779	5474	5086	295.48	5.8%

*number of samples for each test n=16.

Preparation Before The Experiment

All reagents
Bring all reagents to 37°C prior to use. Also the TMB incubation time estimate (20-25min) is based on 37°C.

Wash buffer
Prepare 500 ml of Working Wash Buffer by diluting the supplied 20 ml of Wash Buffer (25 x) with 480 ml of deionized or distilled water. If crystals have formed in the concentrate, warm to room temperature and mix it gently until crystals have completely dissolved.

Biotinylated Anti-Human ENG antibody
It is recommended to prepare this reagent immediately prior to use by diluting the Human ENG Biotinylated antibody (50x) 1:50 with Antibody Diluent. Prepare 50 µl by adding 1 µl of Biotinylated antibody (50x) to 49 µl of Antibody Diluent. Mix gently and thoroughly and use within 2 hours of generation.

Avidin-Biotin-Peroxidase Complex
It is recommended to prepare this reagent immediately prior to use by diluting the Avidin-Biotin-Peroxidase Complex (30x) 1:30 with Avidin-Biotin-Peroxidase Diluent. Prepare 400 µl by adding 10 µl of Avidin-Biotin-Peroxidase Complex (30x) to 390 µl of Avidin-Biotin-Peroxidase Diluent. Mix gently and thoroughly and use within 2 hours of generation.

Human ENG Standard
It is recommended that the standards be prepared no more than 2 hours prior to performing the

experiment. Use one 10 ng of lyophilized Human ENG standard for each experiment. Gently spin the vial prior to use. Reconstitute the standard to a stock concentration of 10 ng/ml using 1ml of sample diluent. Allow the standard to sit for a minimum of 10 minutes with gentle agitation prior to making dilutions.

Microplate
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.

Dilution of Human ENG Standard

1. Number tubes 1-8. Final Concentrations to be Tube # 1: 10,000.00 pg/ml, # 2: 5,000.00 pg/ml, # 3: 2,500.00 pg/ml, # 4: 1,250.00 pg/ml, # 5: 625.00 pg/ml, # 6: 312.50 pg/ml, # 7: 156.25 pg/ml, # 8: Sample Diluent serves as the zero standard (0 pg/ml).
2. For standard #1, add 1000 µl of undiluted standard stock solution to tube #1.
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.

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.

Cell culture supernatants
Clear sample of particulates by centrifugation, assay immediately, or store samples at -20°C.

Serum
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.

Plasma
Collect plasma using heparin or 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.

Cell lysates
Lyse the cells, make sure there are no visible cell sediments. Centrifuge cell lysates at approximately 10,000 x g for 5 min. Collect the supernatant.

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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 50 µl of the standard, samples, or control per well. And add 50µl of the prepared 1x Biotinylated Anti-Human ENG antibody per well. Add 50 µl of the sample diluent buffer and 50µl of the prepared 1x Biotinylated Anti-Human ENG antibody into the control well (Zero well). At least two replicates of each standard, sample, or control is recommended.
4. Cover with the plate sealer provided and incubate for 60 minutes at RT.
5. 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.
6. Add 100 µl of the prepared 1x Avidin-Biotin-Peroxidase Complex into each well. Cover with plate sealer provided and incubate for 15 minutes at RT.
7. 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.
8. 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.)
9. Add 100 µl of Stop Solution to each well. The color should immediately change to yellow.
10. Within 30 minutes of stopping the reaction, the O.D. absorbance should be read with a microplate reader at 450nm.

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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. 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 ENG

CD105, also called Endoglin, is a homodimeric membrane glycoprotein primarily associated with human vascular endothelium. It is also found on bone marrow proerythroblasts, activated monocytes, and lymphoblasts in childhood leukemia. Endoglin is a component of the transforming growth factor-beta (TGFB) receptor complex and binds TGFB1 with high affinity.1 CD105 gene is mapped to 9q34.1. The coding region of the gene contains 14 exons.2 The protein consists of a homodimer of 180 kDA with disulfide links. Endoglin has a role in the development of the cardiovascular system and in vascular remodeling. Its expression is regulated during heart development. Furthermore, it also has a role in the balance of ALK1 and ALK5 signaling to regulate endothelial cell proliferation.3 Moreover, the elevated expression of endoglin in the surgically excised CNVMs suggested a persisting postmitotic activation in an advanced stage of neovascular tissue.4 The standard product used in this kit is extracellular part of recombinant human CD105, from E26 to G586. As a result of glycosylation, the molecular mass is 75-85KDa.

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