

For the quantitative determination of human β2M concentrations in cell culture supernates, serum, and plasma.

INTRODUCTION

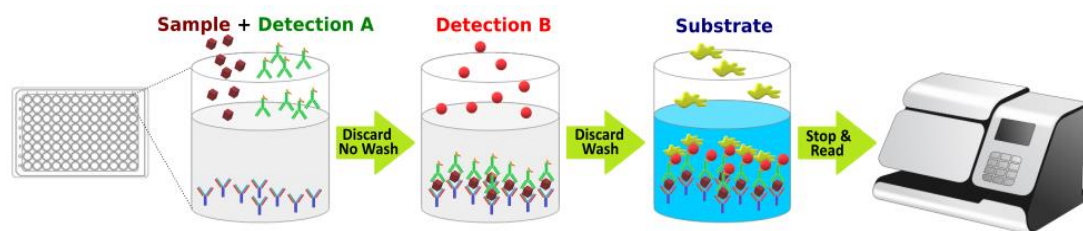
Beta 2-microglobulin (β2M) is a 12 kDa secreted polypeptide and a low molecular weight protein consisting of a single chain of 100 amino acids. It is expressed on the membrane of almost all nucleated cells and is detectable in all body fluids as a shedding product of the cell membrane. Elevated β2M levels have been observed in certain cancers and autoimmune diseases, including multiple myeloma, breast, thyroid, liver and oral squamous cell carcinomas, rheumatoid arthritis, and systemic lupus erythematosus. Therefore, β2-microglobulin is an important tool for diagnosis, prediction, and monitoring of various diseases in research and clinical settings.

The Tribio™ Fast Human β2M ELISA is designed to quantitatively detect Human β2M levels in different tissues including skin, muscle, neural, serum, and other biological samples. The main feature is that the kit uses our novel proprietary approaches to combine samples and detections into a one-step instead of the complicated traditional methods. It makes the assay simple, easy, accurate and fast. The measurement can be finished in 3 hours, not needing 4-5 hours (Fig. 1). The detection range is from 15 to 1000 pg/mL. The levels of human β2M samples are parallel to the standard curves obtained using the kit standards linearly. These results indicate that this kit can be used to determine relative mass values for natural human β2M protein.

PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique (See Fig. 1). A monoclonal antibody specific for human β2M was pre-coated onto a microplate. Standards or samples are pipetted into the wells and incubated with biotin-conjugated detection antibody specific for human β2M, and streptavidin-HRP. Following a wash to remove any unbound antibody and samples, an ultra-sensitive TMB substrate solution is added to the wells for color development. The color intensity is in proportion to the amount of β2M bound in the initial step. The intensity of the color is measured by plate read at 450 nm.

Fig. 1: Assay Principle:



KIT CONTENT AND STORAGE CONDITIONS

PART	PART#	DESCRIPTION	STORAGE OF OPENED/ RECONSTITUTED
Human β2M Microplate	TBS3218A	96 well polystyrene microplate (12 strips of 8 wells) coated with a polyclonal antibody specific for human β2M.	Return unused wells to the foil pouch. Reseal along the entire edge of the zip-seal. May be stored for up to 1 month at 2-8 °C.
Human β2M Standard	TBS3218B	30 µl of Recombinant human β2M protein (50ng/mL).	Aliquot and store at -20 °C for up to 1 month in a manual defrost the freezer. Avoid repeated freeze-thaw cycles.
Detection A	TBS3218C	2.1 ml of Biotin-Human β2M antibody.	May be stored for up to 3 months at 2-8 °C.*
Detection B	TBS3218D	300 µl of Streptavidin-HRP.	
Assay Diluent	TBS3218E	25 ml of a buffered protein base with preservatives.	
Wash Buffer	TBS3000W	12 ml of concentrated solution (10x).	
TMB Substrate	TBS3000T	12 ml of ultra-sensitive TMB substrate.	
Stop Solution	TBS3000S	6ml of 2 N sulfuric acid.	

Store the unopened kit at 2-8 °C. Do not use past kit expiration date. The kit contains sufficient materials to run an ELISA on one 96 well plate.

PRECAUTIONS

Wear protective gloves, clothing, eye, and face protection. Wash hands thoroughly after handling.

REAGENT PREPARATION

Bring all reagents to room temperature before use.

Wash Buffer: Add 12 mL of Wash Buffer Concentrate (10x) to 108 mL of deionized distilled water to prepare 120 mL of Wash Buffer (If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved.).

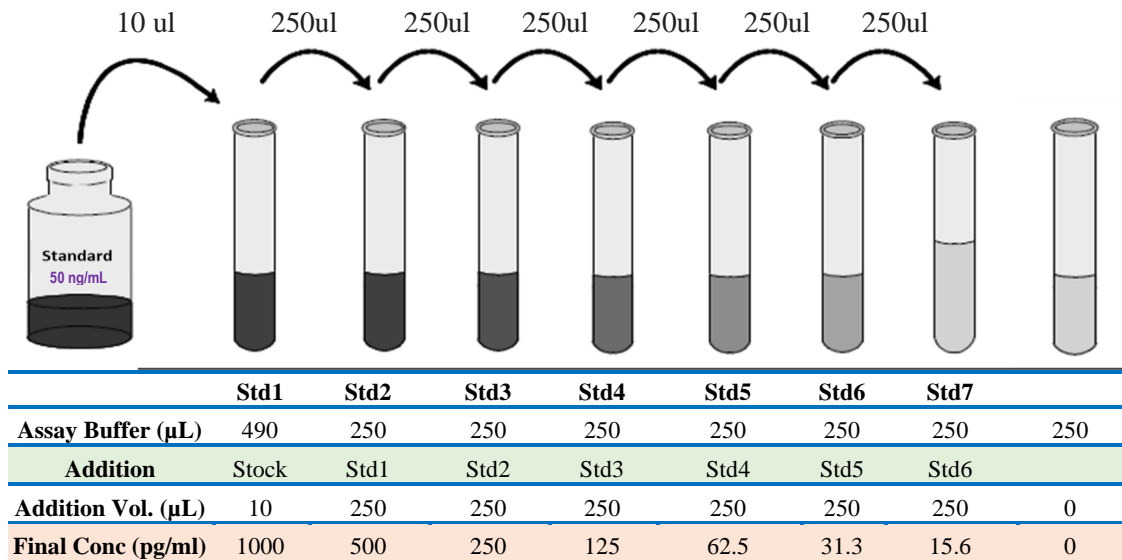
Detection B working solution preparation: Add 240 μL of **Detection B** streptavidin-HRP to 12 mL Assay Diluent to prepare Detection B working solution.

Human β2M Standard Preparation:

Label test tubes as #1 through #8. Pipet 490 μL of 1x Assay Diluent into tube #1, and 250 μL into tubes #2 to #8 as diagram below (Fig.2).

1. Add 10 μL of the Human β2M Standard stock solution (50ng/mL) by dilution of 50X to tube #1 (1000pg/mL), and mix.
2. Make 2x serial dilutions of the standard using the 250pg/mL standard solution (tube #1) from tube #2 through #7 with sequential transfer of 250 μL to the next concentration. Mix each tube thoroughly before the next transfer. The standard concentration in tube 1 through 7 will be 1000, 500, 250, 125, 62.5, 31.3, and 15.6pg/mL. Tube# 8 is Standard 0.

Fig.2 Diagram for Human β2M standard preparation



ASSAY PROCEDURE

Bring all reagents and samples to room temperature before use. It is recommended that all standards, controls, and samples be assayed in duplicate.

1. Add 80 μL of standard, sample, or control per well.
2. Add 20 μL of **Detection A** to the above standard and sample of each well, thoroughly mix. Cover with the adhesive sealer. Incubate at **RT for 2 hours**.
3. Aspirate each well (no wash). Invert the plate and blot it against clean paper towels.
4. Add 100 μL of **Detection B** to each well. Incubate at **RT for 1 hour**.
5. Aspirate each well, and wash for 3 times by filling each well with 300 μL Wash Buffer (Complete removal of liquid at each step is essential to good performance). After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
6. Add 100 μL of **TMB Substrate** to each well. Incubate at **RT for 10-20 min** (Protect from light). The color becomes blue.

7. Add 50 μL of **Stop Solution** to each well. The color in the well should change from blue to yellow (gently tap the plate to ensure thorough mixing).
8. Determine the optical density of each well within 20 minutes, using a microplate reader at 450 nm. If wavelength correction is available, set to 540 nm or 570 nm. If wavelength correction is not available, subtract readings at 540 nm or 570 nm from the readings at 450 nm. This subtraction will correct for optical imperfections in the plate. Readings made directly at 450 nm without correction may be higher and less accurate.

CALCULATION OF RESULTS

Average the duplicate readings for each standard, control, and sample subtract the average zero standard optical density (O.D.).

Create a standard curve using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, construct a standard curve by plotting the mean absorbance for each standard on the Y-axis against the concentration on the X-axis and draw a best fit curve through the points on the graph. The data may be linearized by plotting the log of the human β2M concentrations versus the log of the O.D. and the best fit line can be determined by regression analysis. This procedure will produce an adequate but less precise fit of the data.

TYPICAL DATA

This standard curve ($R^2=0.9995$) is provided for demonstration only. A standard curve should be generated for each set of samples assayed. Fig. 3 is an example of typical Data.

SENSITIVITY

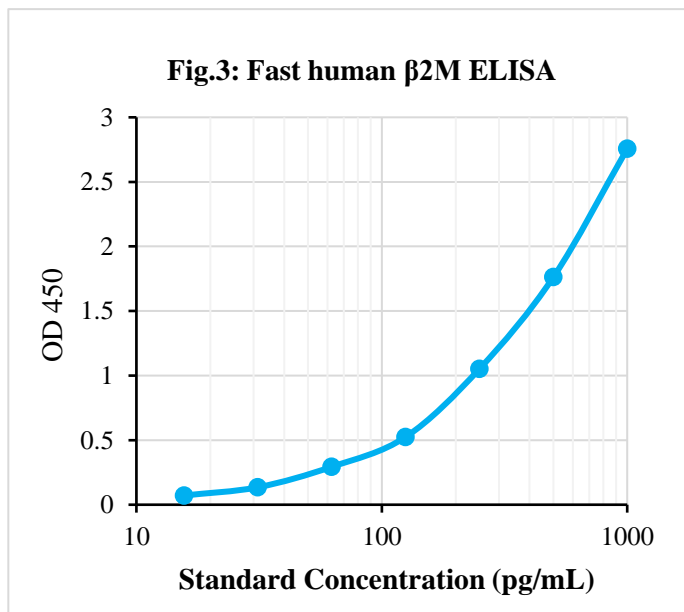
The minimum detectable dose (MOD) of human β2M is typically 10 pg/ml.
The Intra-assay CV is 3.79% the Inter-assay CV is <10%.

SPECIFICITY

This assay recognizes natural and recombinant human β2M.

RELATIVE PRODUCTS

- Human IL-1β ELISA (TBS3219)
- Human IL-2 ELISA (TBS3220)
- Human IL-4 ELISA (TBS3221)
- Human IL-6 ELISA (TBS3223)
- Human IL-7 ELISA (TBS3224)
- Human IL-8 ELISA (TBS3225)
- Human IL-10 ELISA (TBS3226)
- Human IL-13 ELISA (TBS3227)
- Human IL-17 ELISA (TBS3228)
- Human IL-22 ELISA (TBS3229)
- Human IFN-gamma ELISA (TBS3230)
- Human TGF- β1 ELISA (TBS3232)
- Human GM-CSF ELISA (TBS3233)
- Human MIP-1α ELISA (TBS3234)



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