

For the quantitation of human TSH β concentrations in cell culture supernatants, serum, and plasma.

INTRODUCTION

Human Thyroid-Stimulating Hormone Beta (TSH β) is a subunit of Thyroid-Stimulating Hormone (TSH), a glycoprotein hormone produced by the anterior pituitary gland. The TSH β subunit contains 138 amino acids, including a 20-amino-acid signaling peptide and 118 amino acids that make up the mature protein. Abnormal TSH β levels have important clinical implications, particularly in thyroid hormone regulation and related disorders. For example, abnormal TSH β levels can disrupt the hypothalamic-pituitary-thyroid (HPT) axis, leading to conditions such as hyperthyroidism or hypothyroidism.

The Fast Human TSH β ELISA is a solid phase ELISA designed to measure human TSH β levels in cell culture supernatants, serum, and plasma. 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 1 hour, with no need for 5-6 hours (Fig. 1). The detection range is from 31 to 2000 pg/mL. The levels of human TSH β 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 TSH β protein.

PRINCIPLE OF THE ASSAY

This assay employs our novel proprietary sandwich enzyme immunoassay techniques (see Fig. 1). A monoclonal antibody specific for human TSH β is pre-coated onto a microplate. Standards or samples and a biotin conjugated detection antibody are pipetted into the wells and concurrently incubated to form a sandwich complex in one step. Simply aspirate each well without washing and directly add Streptavidin-HRP into the complex. Following a wash, an **ultra-sensitive TMB substrate solution** is added to the wells for color development. The color intensity is proportional to the amount of TSH β bound in the initial step. The intensity of the color is measured by plate reading at 450 nm.

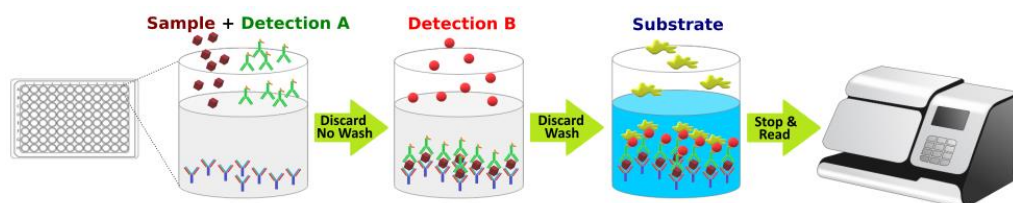


Fig.1: Simple ELISA procedure

KIT CONTENT AND STORAGE CONDITIONS

| PART | PART# | DESCRIPTION | STORAGE OF OPENED/ RECONSTITUTED |
|------------------------------|----------|---|--|
| Human TSH β Microplate | TBS3273A | 96 well microplate (12 strips of 8 wells) coated with a Capture Antibody specific for human TSH β . | The unused wells can be stored in the sealed foil pouch containing the desiccant pack for up to 1 month at 2-8 °C. |
| Human TSH β Standard | TBS3273B | 30 μ L of Recombinant human TSH β protein (100ng/mL). | Aliquot and store at -20 °C for up to 1 month in a manual defrost freezer. Avoid repeated freeze-thaw cycles. |
| Detection A | TBS3273C | 2.1 mL of human TSH β antibody. | May be stored for up to 3 months at 2-8 °C. |
| Detection B | TBS3273D | 12 mL of Streptavidin-HRP | |
| Assay Diluent | TBS3273E | 12 mL of a buffered protein base with preservatives. | |
| 10x Wash Buffer | TBS3000W | 12 mL of concentrated solution (10x). | |
| TMB Substrate | TBS3000T | 12 mL of ultra-sensitive TMB substrate. | |
| Stop Solution | TBS3000S | 6 mL 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

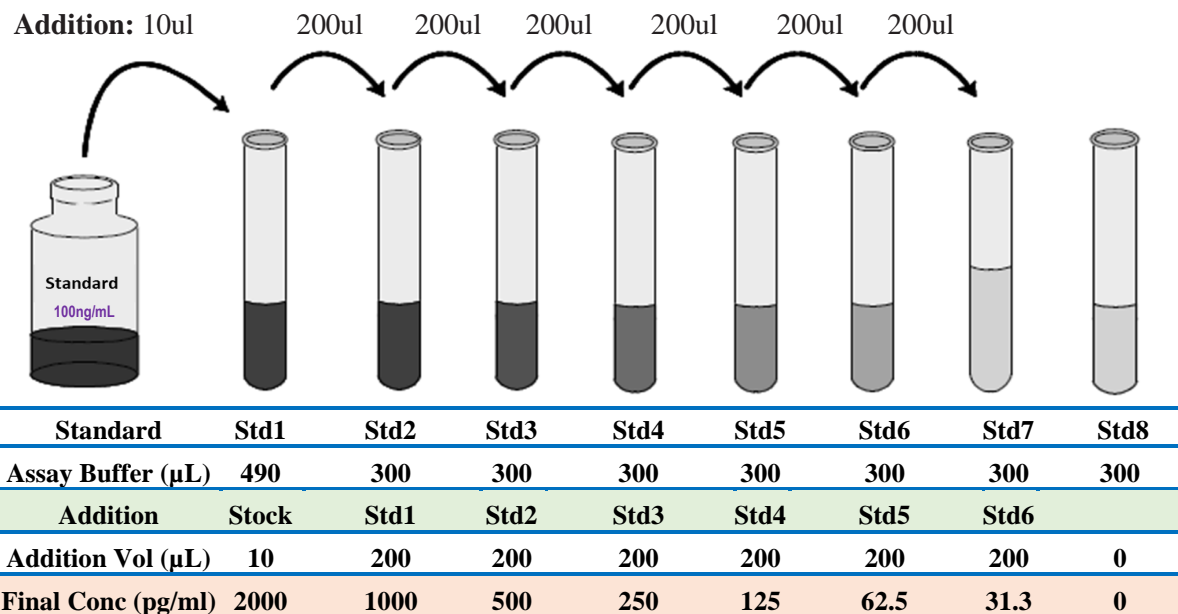
Bring all reagents to room temperature before use.

Wash Buffer: Add 10 mL of Wash Buffer Concentrate (10x) to 90 mL of deionized distilled water to prepare 100 mL of Wash Buffer (*If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved.*).

Human TSH β Standard Preparation:

1. Label test tubes as #1 through #8. Pipet 490 μ L of 1x Assay Diluent into tube #1, and 300 μ L into tubes #2 to #8 as diagram below.
2. Add 10 μ L of the Human TSH β Standard stock solution (100ng/mL) by dilution of 50X to tube #1 and mix.
3. Make 2x serial dilutions of the standard using the 2000pg/mL standard solution from tube #2 through #7 with sequential transfer of 200 μ L to the next concentration. Mix each tube thoroughly before the next transfer. The standard concentration in tube 1 through 7 will be 2000, 1000, 500, 250, 125, 62.5 and 31.3 pg/mL. Tube# 8 is Standard 0.

Fig.2 Diagram for Human TSH β 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 μ L of standard, sample, or control per well.
2. Add 20 μ L of **Detection A** to the above standard and sample of each well, thoroughly mix. Cover with the adhesive sealer. Incubate at **RT for 60 min.**
3. Aspirate each well (*no wash*). Invert the plate and blot it against clean paper towels.
4. Add 100 μ L of **Detection B** to each well. Incubate at **RT for 30 min.**
5. Aspirate each well, and wash for 3 times by filling each well with 300 μ L 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 μ L of **TMB Substrate** to each well. Incubate at **RT for 10-20min** (*Protect from light*). The color becomes blue. If the color is light, the incubation time can be longer.

7. Add 50 μ L 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). Read plate in 5 minutes after adding Stop Solution.
8. Determine the optical density of each well within 5 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 TSH β 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 ($R^2=1.000$) is provided for demonstration only. A standard curve should be generated for each set of samples assayed.

SENSITIVITY

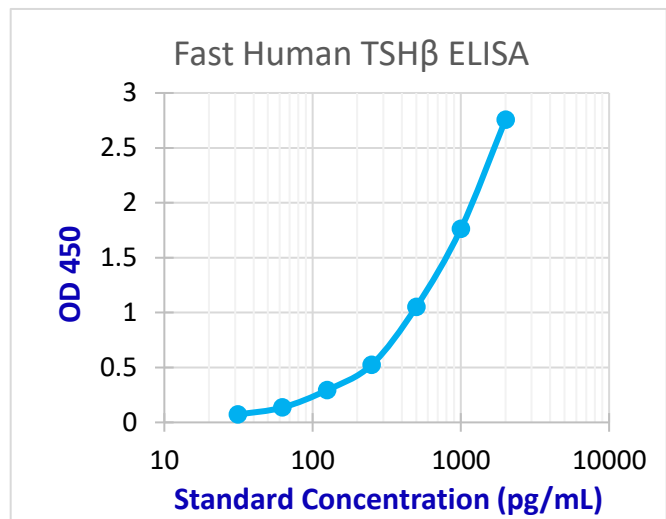
The minimum detectable dose (MOD) of human TSH β is typically 5 pg/ml.
The Intra-CV is < 10%, the Inter-CV is < 12%.

SPECIFICITY

This assay recognizes natural and recombinant human TSH β .

RELATIVE PRODUCTS

- Human CEA ELISA (TBS3210)
- Human AFP ELISA (TBS3212)
- Human HE4 ELISA (TBS3213)
- Human IL-1 β 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-13 ELISA (TBS3227)
- Human IL-17 ELISA (TBS3228)
- Human IL-22 ELISA (TBS3229)
- Human IFN-gamma ELISA (TBS3230)
- Human TGF- β 1 ELISA (TBS3232)
- Human GM-CSF ELISA (TBS3233)
- Human MIP-1 α ELISA (TBS3234)
- Human TNF- α ELISA (TBS3235)
- Human IL-18 ELISA (TBS3239)



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