For the quantitative determination concentrations of CHO Host Cell Protein concentrations in samples

INTRODUCTION

Host Cell Proteins (HCPs) are proteins expressed by the host cell line used in biopharmaceutical manufacturing. Chinese Hamster Ovary (CHO) cells are mammalian epithelial cells derived from the ovary of the Chinese hamster. They are widely used for recombinant therapeutic protein production, such as monoclonal antibodies and Fc-fusion proteins, due to their ability to perform complex post-translational modifications like glycosylation and protein folding, similar to human cells.

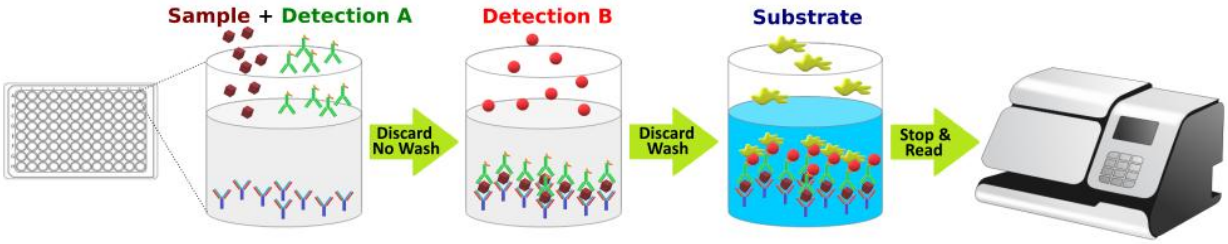
Tribioscience's CHO Host Cell Protein ELISA is designed to quantitatively detect CHO HCP levels in samples. The main feature is that the kit uses our novel proprietary approaches to combine samples and detections into a one-step instead of the complicated traditional methods. It makes the assay simple, easy, accurate, and fast (Fig. 1). The detection range is from 1 to 810 ng/mL. The levels of HCP samples are parallel to the standard curves obtained using the kit standards linearly. Therefore, the kit can be used to determine relative mass values for CHO protein.

Synonyms: Chinese Hamster Ovary Host Cell Protein; CHO HCP

PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique (See Fig. 1). A monoclonal antibody specific for CHO HCP was pre-coated onto a microplate. Standards and samples are pipetted into the wells, and then incubated with a Biotin-conjugated detection antibody specific for CHO HCP. Following streptavidin-HRP binding and a wash to remove any unbound antibodies 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 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
CHO HCP Microplate	TBS31004A	96 well polystyrene microplate (12 strips of 8 wells) coated with a monoclonal antibody specific for CHO HCP.	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.
CHO HCP Standard	TBS31004B	50 µl of Recombinant CHO HCP (8.1 µg/mL).	Aliquot and store at -20 °C for up to 1 month in a manual defrost freezer. Avoid repeated freeze-thaw cycles.
Detection A	TBS31004C	2.1 mL of biotin-CHO HCP antibody.	May be stored for up to 3 months at 2-8 °C.
Detection B	TBS31004D	200 µL of streptavidin HRP.	
Assay Diluent	TBS31004E	25 mL of a bufferedprotein base with preservatives.	
Wash Buffer	TBS3000W	12mL 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, eyes, and face protection. Wash hands thoroughly after handling.

REAGENT PREPARATION

Bring all reagents to room temperature before use.

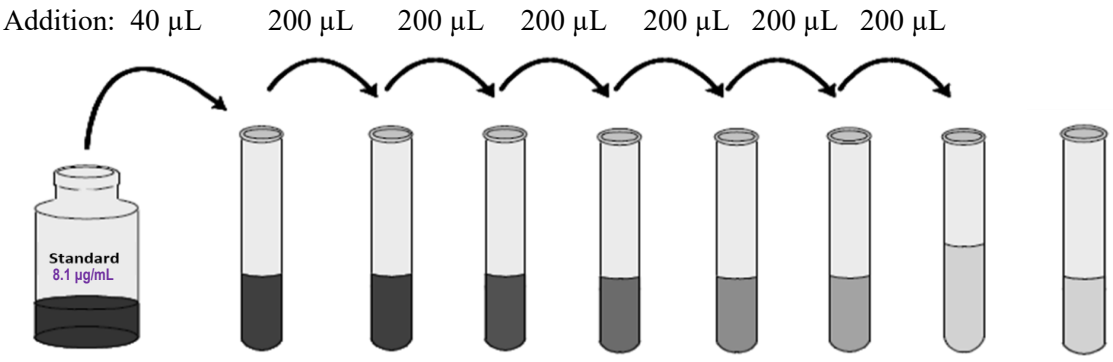
Wash Buffer: Add 12 mL of Wash Buffer Concentrate (10x) to 108 mL of deionized distilled water to prepare 120 mL of Wash Buffer (*If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved).*

Detection B working solution preparation: Add 150 µL of **Detection B** streptavidin-HRP to 12 mL Assay Diluent (TBS31004E) to prepare Detection B working solution.

CHO HCP Standard Preparation: Label test tubes as #1 through #8. Pipet 360 µL of 1x Assay Diluent into tube #1, and 200 µL into tubes #2 to #8 **as diagram below.**

1. Add 40 µL of the CHO HCP Standard stock solution (8.1 µg/mL) to tube #1 and mix.
2. Make 3x serial dilutions of the standard using Tube #1 (810 ng/mL standard solution) from Tube #2 through #7 with sequential transfer of 200 µL to the next concentration. Mix each tube thoroughly before the next transfer. The standard concentration in tube 1 through 7 will be 810, 270, 90, 30, 10, 3.3 and 1.1 ng/mL. Tube# 8 is Standard 8 (0 ng/mL).

Fig.2 Diagram for CHO Host Cell Protein standard preparation



	Std1	Std2	Std3	Std4	Std5	Std6	Std7	Std8
Assay Buffer (µL)	360	200	200	200	200	200	200	200
Addition	Stock	Std1	Std2	Std3	Std4	Std5	Std6	
Addition Vol. (µL)	40	200	200	200	200	200	200	0
Final Conc (ng/mL)	810	270	90	30	10	3.3	1.1	0

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 with shaking.**
3. Aspirate each well (no wash). Invert the plate and blot it against clean paper towels.
4. Add 100 µL of **Detection B working solution** to each well. Incubate at **RT for 1 hour with shaking**.
5. Aspirate each well, and wash 3 times by filling each well with 300 µL Wash Buffer (*Complete removal of the 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 minutes with shaking** (*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 542 nm or 570 nm. If wavelength correction is not available, subtract readings at 542 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 CHO HCP 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=0.9972) 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 (MDD) of CHO HCP is typically 1 ng/mL.

The Intra-assay CV is < 6.6% and the Inter-assay CV are < 9%.

SPECIFICITY

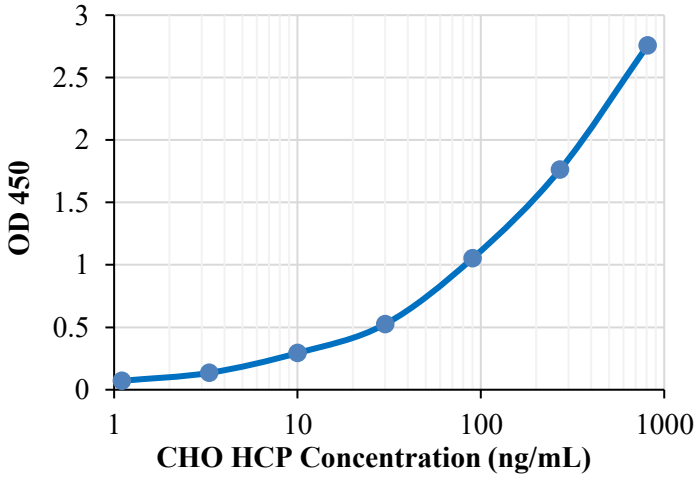
This assay recognizes natural and recombinant CHO HCP.

No cross-reactivity with others.

RELATIVE PRODUCTS

Human p-Tau-217 ELISA (TBS3293)
Human p-Tau-181 ELISA (TBS3294)
Human Total Tau ELISA (TBS3295)
Human p-Tau-231 ELISA (TBS3296)
Human AD7c NTP (TBS3297)
Human Amyloid ß40 ELISA (TBS3298)
Human NF-L ELISA (TBS32101)
Human Total Amyloid ß ELISA (TBS32104)
Human UCHL1/PGP9.5 ELISA (TBS32107)
Human Gamma H2AX ELISA (TBS3265)
Human H2AX ELISA (TBS3266)
Human IL-4 ELISA (TBS3221)
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 IL-33 ELISA (TBS4245)
Human IFN-gamma ELISA (TBS3230)
Human TGF- ß1 ELISA (TBS3232)
Human GM-CSF ELISA (TBS3233)
Botulinum Neurotoxin Type A (BoNT-A) ELISA (TBS31007)
Botulinum Neurotoxin Type B (BoNT-B) ELISA (TBS31009)

Fig.3 CHO HCP Standard Curve



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