Application Note 1.0

Adherent Growth of CHO cells in Thermo Scientific HyClone SFM4CHO-A medium using Corning® CellBIND® Surface Culture Flasks

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Key Words
- CHO
- Adherent
- Serum-Free
- Cell Culture

Introduction

One of the most important cell lines used in the production of recombinant proteins is the Chinese Hamster Ovary (CHO) cell line. CHO cell lines can be cultured adherently to a substrate or in suspension. Traditionally, the adherent culture of CHO cells has required serum-containing medium. Regulatory concerns surrounding the use of animal-derived components in the production of therapeutic proteins is driving improvements in culturing parameters of adherent CHO cell lines. Standard CHO serum-free media formulations have failed to equal serum-containing medium in adherence, spreading and growth using standard tissue-culture surfaces.

Thermo Scientific HyClone SFM4CHO-A, was developed for culturing adherent CHO cells using the Corning® CellBIND® surface, which shows superior adherence, spreading and growth compared to standard Tissue Culture Treated (TCT) culture surfaces.

Materials and Methods

Cell Line:	CHO-K1 Chinese Hamster Ovary Cell Line
Medium:	HyClone SFM4CHO-A Ham's F12 with 10% FBS Competitor CHO Attachment Medium
Culture Flask:	Standard Flask: TCT25 Corning® Tissue Culture Treated 25 cm^2 Loose lid during culture Corning® CellBIND® surface flask: 25 cm^2 vent cap Tight lid during culture
Incubator:	37°C; 5% CO_2
Culture:	6 mL per flask batch culture

Discussion

Typically CHO cell lines can achieve between 200,000-400,000 cells/cm^2 in serum-containing medium using standard TCT cell culture surfaces. HyClone® SFM4CHO-A™, serum-free medium developed for adherent culture, when combined with the Corning® CellBIND® surface improved cell densities into the 400,000-600,000 cells/cm^2 range (Figure 1). Improvements in growth can be observed when comparing standard TCT and Corning® CellBIND® surface flasks in serum-free culture in SFM4CHO-A medium (Figure 2). Improvements can also be observed in attachment and spreading as seen in the example photomicrographs (Figure 3). Exceptional growth is also seen when comparing serum-free growth of CHO cells in SFM4CHO-A and a competitor serum-free medium (Figure 4).

Conclusion

CHO cells were successfully grown adherently in serum-free SFM4CHO-A on both standard TCT and Corning® CellBIND® surfaces. Using HyClone SFM4CHO-A and the Corning® CellBIND® surface, CHO cells significantly improved adhesion, spreading and growth compared to serum-free culture on standard TCT surfaces. This combination also exceeded the performance of serum containing medium when culturing CHO cells.

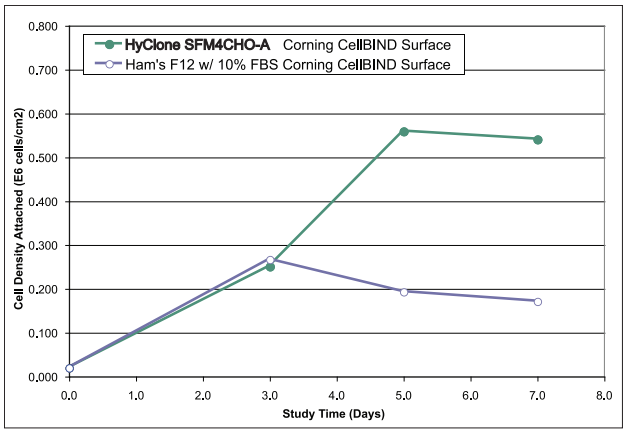

Figure 1 Growth study of CHO-K1 cells in HyClone SFM4CHO-A and Ham's F12 with 10% FBS using the Corning® CellBIND® surface.

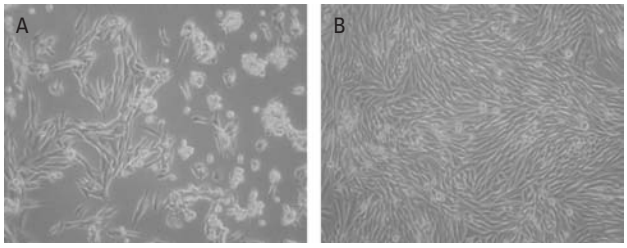

Figure 3 Example photomicrographs (200X) of CHO-K1 cell day 4 post-seeding; cultured in HyClone SFM4CHO-A medium in (A) standard Tissue Culture Treated surface and (B) Corning® CellBIND® Surface culture surfaces. No feeds or media exchanges.

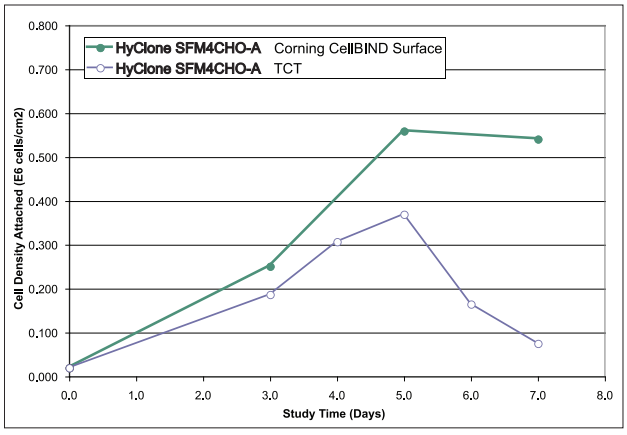

Figure 2 Growth study of CHO-K1 cells in HyClone SFM4CHO-A on Corning® CellBIND® surface and Tissue Culture Treated surfaces.

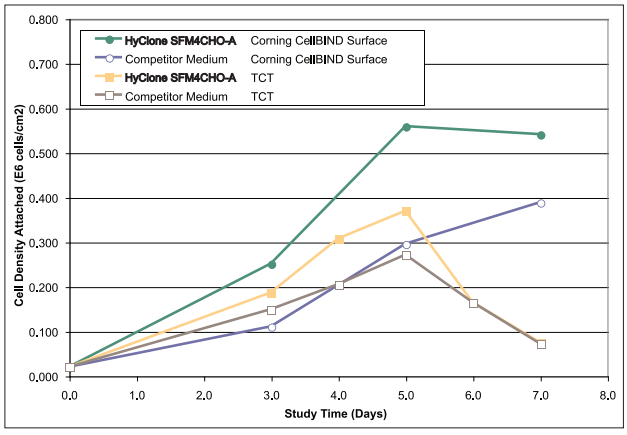

Figure 4 Growth study of CHO-K1 cells in HyClone SFM4CHO-A and a competitor medium on Corning® CellBIND® surface and Tissue Culture Treates surfaces.

Ordering Information

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f 81 (0) 3-3586 1291/1292

Latin America
t (52-81)-8158-8400
f (52-81)-8313-8589

Name	Part Number	Qty/Pk	Qty/Cs	Description
Flask	07-201-222	20	200	Flask, 25 cm², Corning® CellBIND® Surface with Vent Cap, Sterile
	05-539-104	5	100	Flask, 75 cm², Corning® CellBIND® Surface with Vent Cap, Sterile
	05-539-103	5	50	Flask, 150 cm², Corning® CellBIND® Surface with Vent Cap, Sterile
	07-201-225	5	50	Flask, 175 cm², Corning® CellBIND® Surface with Vent Cap, Sterile
	07-201-226	5	25	Flask, 225 cm², Corning® CellBIND® Surface with Vent Cap, Sterile
	08-757-212	5	50	Flask, 175 cm², Corning® CellBIND® Surface with Phenolic Cap, Sterile
	08-757-211	7	84	Flask, 175 cm², Corning® CellBIND® Surface, Barcoded with Vent Cap, Sterile
	07-203-10	7	42	Expanded Surface Flask, 235 cm², Corning® CellBIND® Surface, Bar Code, with Vent Cap, Sterile

HyClone®

Name	Part Number	L-Glutamine	Size	Description
HyClone SFM4CHO-A	SH3082001	Without L-Glutamine (Liquid)	500 mL	Protein-free medium for the adherent culture of CHO cells using a variety of culture systems including t-flasks and roller bottles.
	SH3082002	Without L-Glutamine (Liquid)	1000 mL	
	SH30820LS	Without L-Glutamine (Liquid)	6 X 1000 mL	

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