Corning® hybrigro SF™ Medium for High Density Hybridoma Culture and Increased Production

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SnAPPShots
A brief technical report from the Corning Applications Group

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Introduction

There is potential that the use of antibodies as therapeutic candidates will increase significantly over the next few years. With this increase, more efficient and cost effective methods for manufacturing antibodies will become necessary. Corning® hybrigro SF™ medium aims to solve this problem by increasing hybridoma yields and production efficiency without the use of costly serum. In this paper we demonstrate how hybrigro SF outperforms two commercially available serum-free hybridoma media, as well as a commonly used serum-containing formulation resulting in higher cell density and protein production using two different hybridoma cell lines.

Method and Materials

MH677 (proprietary hybridoma cell line) and AE1 (ATCC Cat. No. HB-72) cells were cultured in Dulbecco's Modification of Eagle's medium (DMEM) (Corning Cat. No. 10-013-CM) supplemented with 10% fetal bovine serum (FBS) (Corning Cat. No. 35-010-CV) and enumerated using the BioProfile® Flex analyzer (Nova Biomedical). MH677 cells were resuspended in either hybrigro SF medium (Corning Cat. No. 40-215-CV) or competitor serum-free hybridoma media. AE1 cells were resuspended in either hybrigro SF medium, DMEM supplemented with 10% FBS, or competitor serum-free hybridoma medium. Cells were seeded into 125 mL Erlenmeyer flasks (Corning Cat. No. 431405) at a concentration of 5 x 10^4 cells/mL. Cells were grown for 4 days in a humidified incubator at 5% CO_2 and 37°C at 90 rpm. Daily culture samples were assessed for cell viability, nutrient, and metabolite analysis on the BioProfile Flex. Samples were also collected from each vessel for protein production (Mouse IgG2a), which was assessed by following the IgG2a ELISA protocol provided by Alpha Diagnostic International (Alpha Diagnostic International Cat. No. 6340) for MH677 or the Easy Titer IgG Assay kit from Pierce (ThermoFisher Cat. No. 23300).

Results

MH677 Cell Growth and Function

MH677 cells cultured in the hybrigro SF medium exhibited higher cell density than cultured in either of the two serum-free hybridoma media tested. The analysis shows the results on the fourth day of growth to be statistically significant (ANOVA Newman-Keuls Post Test) (Figure 1). Additionally, MH677 cells grown in hybrigro SF medium had statistically higher IgG2a production as compared to both competitor serum-free hybridoma media (ANOVA Newman-Keuls Post Test) (Figure 2).

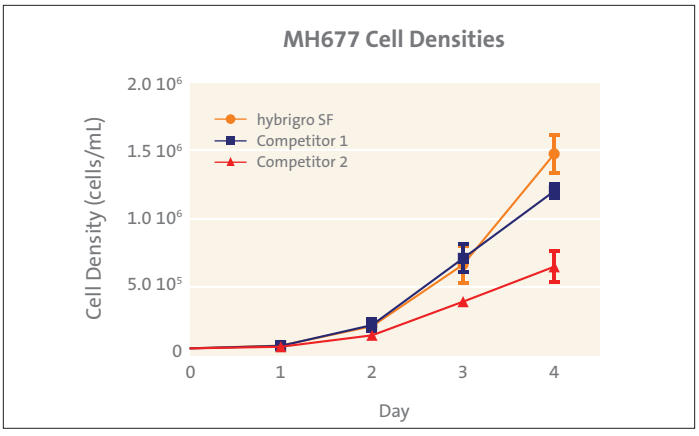

Figure 1. MH677 cells showed significantly increased cell densities by day four compared to competitor serum-free hybridoma media (n=9 ANOVA Newman-Keuls Post Test).

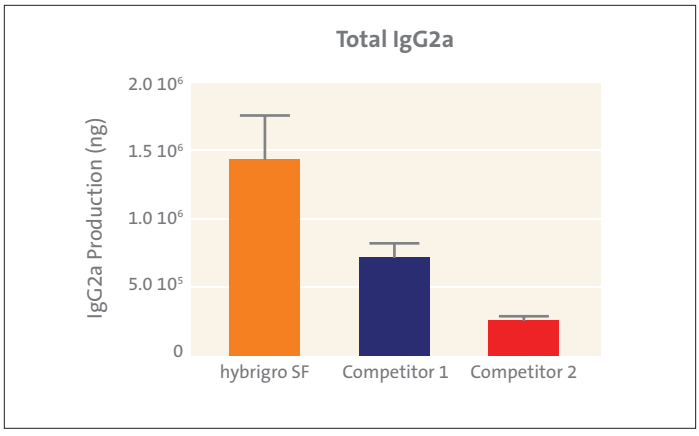

Figure 2. MH677 cultured in Corning hybrigro SF showed statistically higher levels of IgG2a production compared to both competitor serum-free media (n=9 ANOVA Newman-Keuls Post Test).

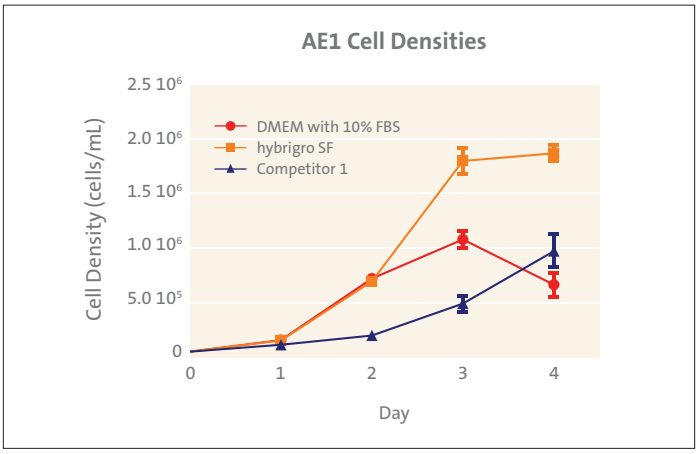

Figure 3. AE1 cells cultured in Corning hybrigro SF medium showed significantly increased cell densities by day four compared to competitor serum-free medium and a serum containing medium (n=9 ANOVA Bonferroni Post Test).

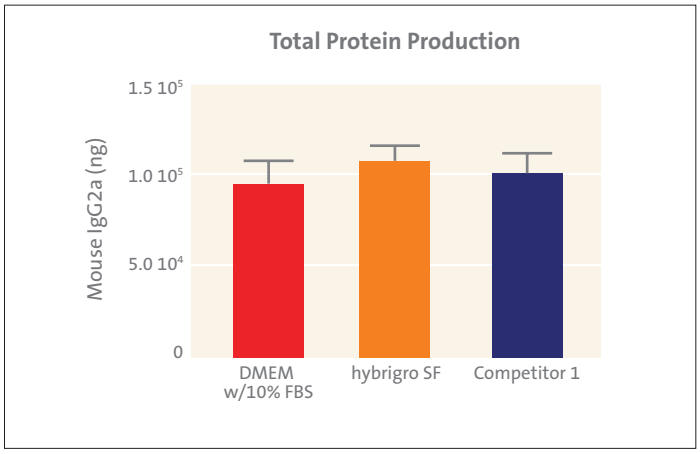

Figure 4. AE1 cells cultured in Corning hybrigro SF medium produced significantly higher protein production after four days of culture compared to a competitor serum-free medium and a serum-containing medium (n=9 ANOVA Bonferroni Post Test).

AEI Cell Growth and Function

AEI cells grown in Corning® hybrigro SF™ medium not only outperformed cells grown in a commercially available serum-free hybridoma medium, but they also outperformed cells growing in serum-containing medium in terms of cell density achieved after 4 days of growth (Figure 3). This was found to be statistically significant (ANOVA).

In addition to cell growth, AEI cells cultured in hybrigro SF medium also had statistically significant higher total protein production after 4 days of growth (ANOVA) compared to serum-containing and competitor serum-free media (Figure 4).

Conclusions

- Higher MH677 and AE1 cell densities can be achieved with hybrigro SF medium as compared to other commercially available serum-free hybridoma media.
- MH677 cells and AE1 cells produced more mouse IgG when grown in hybrigro SF medium as compared to equilavent serum-free hybridoma media.
- AE1 cells achieved higher densities and higher protein production in hybrigro SF medium as compared to DMEM containing 10% FBS.
- hybrigro SF medium is an ideal choice for proliferation of hybridoma cultures and the production of monoclonal antibodies.

For additional product or technical information, please visit **www.corning.com/lifesciences/media** or call 1.800.492.1110. Outside the United States, please call 978.442.2200.

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