Custom Production and Packaging

When you need a unique formulation or special packaging, our Custom Product Services team can modify GIBCO™ catalogue media formulations and packaging to meet your particular requirements.

The Custom Product Services team can also assess feasibility and provide options for formulation design, testing, and packaging for your proprietary formulations. We can process volumes as small as one liter or, with our unique integrated media preparation system, produce homogenous lots of up to 50,000 liters for production use.

Product	Cat. No.	Size
New CD Hybridoma Medium (1X), liquid	11279-015	500 ml
	11279-023	1,000 ml
Hybridoma-SFM (1X), liquid	12045-076	1,000 ml
eRDF, powder	custom	•
OPTIMAb® Monoclonal Antibody Production Enhancer (100X), liquid	11910-031	100 ml
HAT Supplement (100X), lyophilized	31062-011	10 x 10 ml
HT Supplement (100X), liquid	11067-030	50 ml
L-Glutamine-200 mM (100X), liquid	25030-149	20 ml
	25030-081	100 ml
GLUTAMAX™ -I Supplement	35050-061	100 ml
Chemically Defined Lipid Concentrate	11905-031	100 ml

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GIBCO™ Invitrogen Corporation

Innovations in Hybridoma Culture

Hybridomas that produce monoclonal antibodies (MAbs) for biopharmacological applications must be cultured in the purest possible nutritive environments: serum-free, protein-free or chemically defined media.

The largest manufacturer of cell culture media in the world, Invitrogen, under the GIBCO™ brand name, is at the forefront of the biotechnology revolution, providing developers of biopharmaceuticals, therapeutics and diagnostics with new nutrient media and other innovative products appropriate for the cultivation of hybridomas. These products are optimized to minimize adaptation time from existing cultures and to simplify the scale-up process.

It is estimated that as many as one-third of all biotechnology products currently in development are MAbs. Your choice of our newest generation of GIBCO™ media, combined with the use of OPTIMAb® Monoclonal Antibody Production Enhancer, will provide you with a powerful MAb-producing system that outperforms all others, offering fewer problems, greater control and growth rates, and higher yields than any other method.

CD Hybridoma Medium

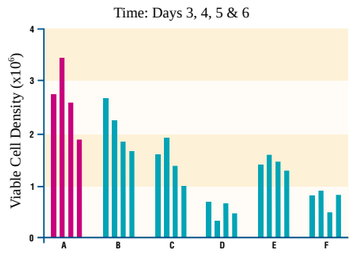
In recent years, hybridoma culture media that require serum supplementation have been replaced by a variety of serum-free formulations. Because they contain proteins, many of these formulations are now considered unacceptable for certain applications. Demand for greater levels of media definition, combined with the need to replace components of animal origin with alternatives that perform as well or better, led to the development of CD Hybridoma Medium.

CD Hybridoma Medium is unique, the first protein-free and chemically defined medium optimized for hybridoma growth and monoclonal antibody production. It contains no components of animal or human origin. It is formulated without L-glutamine, providing added stability.

CD Hybridoma Medium streamlines purification and downstream processing. Because it is manufactured without animal-derived materials, it is less likely to contain adventitious agents. Suitable for the culture of recombinant myeloma lines as well as traditional hybridomas, CD Hybridoma Medium outperforms serum-free and serum-supplemented hybridoma media (*figure 1*). It is designed for batch systems but can be modified easily for use in others (*figure 2*).

Cells growing in traditional serum-supplemented medium can be easily adapted to CD Hybridoma medium. Note: CD Hybridoma medium has not been optimized for lipid dependent cell lines such as NS0. Please inquire about options for those applications.

Growth of Hybridoma TP4-3.1



IgG Production by Hybridoma TP4-3.1

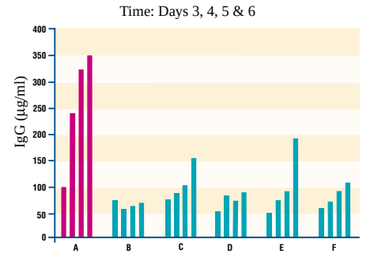


Figure 1. In comparative cell growth studies, Hybridoma TP4-3.1 (proprietary) cells growing in IMDM + 10% FBS were adapted to growth in other media through a minimum of three passages prior to evaluation of growth and monoclonal antibody production in batch culture. *CD Hybridoma Medium was supplemented with 8 mM L-glutamine prior to use. Other media were supplemented as necessary following instructions supplied by the manufacturers. Agitated small-scale suspension cultures of TP4-3.1 cells were grown in 125 mL plastic disposable shake flasks (35 mL culture volume) on an orbital shaker platform at 125–135 rpm. Cells were seeded at 1 x 10^5 viable cells/ml. All cultures were incubated in a humidified atmosphere of 8% CO_2 in air. Total cell counts were determined using an electronic particle counter; viability of cells was estimated by trypan blue dye exclusion. IgG was measured by ELISA.*

KEY: ***A*** *- GIBCO™ CD Hybridoma Medium* ***B*** *- GIBCO™ IMDM+10%FBS* ***C*** *- GIBCO™ Hybridoma-SFM* ***D, E*** *and* ***F*** *are media from other manufacturers.*

Growth and IgG Production of Hybridoma TP6-25.3 in a Bioreactor Culture

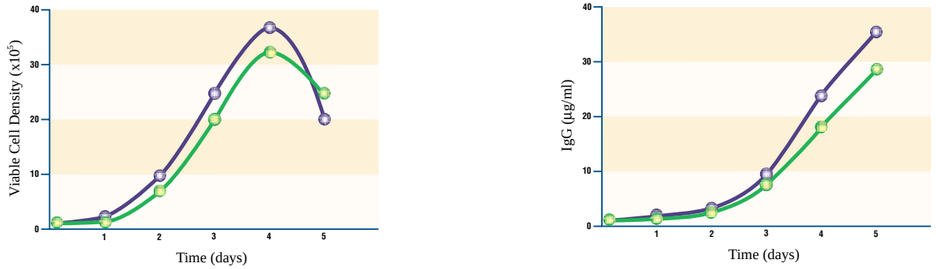


Figure 2. *Cells previously adapted to CD Hybridoma Medium were seeded at 1 x 10^5 viable cells/ml in a bioreactor ( ) or a shake flask control ( ). Growth (left panel) and MAb production (right panel) were measured for 5 days.*

Take Fewer Steps. Get Higher Yields.

TRADITIONAL GROWTH MEDIUM	% LOSS
CONCENTRATION/DIAFILTER	5
AMMONIUM SULFATE PRECIPITATION 1	10
AMMONIUM SULFATE PRECIPITATION 2	10
DIALYZE	5
ION EXCHANGE 1	5
ION EXCHANGE 2	5
PROTEIN A	5
DIAFILTER OR SIZE EXCLUSION	5
FINAL PRODUCT 50% YIELD	**50**

CD HYBRIDOMA MEDIUM	% LOSS
CONCENTRATION/DIAFILTER	5
ION EXCHANGE 1	5
ION EXCHANGE 2	5
DIAFILTER OR SIZE EXCLUSION	5
FINAL PRODUCT 80% YIELD	**20**

This diagram illustrates purification of a hybridoma supernatant containing 150 µg/ml monoclonal antibody with estimated losses at each step. When compared to traditional culture methods, the use of CD Hybridoma Medium can increase yields while simplifying purification schemes. Because the monoclonal antibody is relatively free of other protein contaminants, capture methods can be used on clarified supernatants, eliminating the need for laborious precipitation steps. As illustrated here, monoclonal antibody from highly productive cells may be isolated in high purity using ion exchange methods rather than costly and harsh elution columns such as Protein A or G. Elimination of three to four steps in purification can result in increased antibody yields of 15–20% or more.

Hybridoma-SFM

A complete, ready to use medium, Hybridoma-SFM provides excellent growth and maintenance of hybridoma cells and offers significantly higher MAb yield and simpler downstream processing than serum-supplemented medium (*figure 3*). It is derived from an optimized serum-free basal formulation supplemented with trace elements, minerals, and a low amount (20 µg/ml) of defined protein (insulin and transferrin). Unlike serum-supplemented media, Hybridoma-SFM is free of BSA, steroids, and endogenous bovine immunoglobulin, facilitating purification of specific MAbs. It is easy to use and supports a wide range of hybridoma cell lines in a variety of culture systems.

Hybridoma-SFM is the medium of choice for growing hybridomas which require insulin or transferrin.

Cumulative MAb Production and Number of Cells

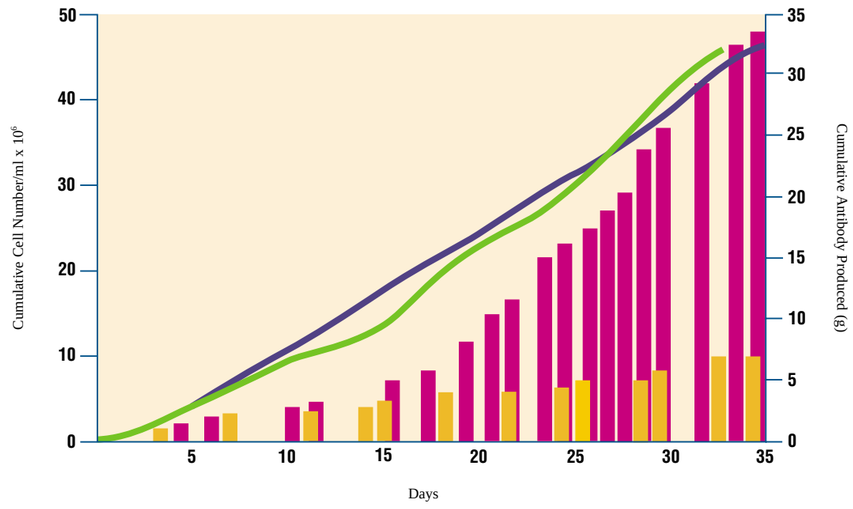


Figure 3. *Cells were cultured in Hybridoma-SFM (,) or D-MEM with FBS (,) (10% until day 10, 7.5% until day 13, and 5% from day 13). Cell number (,) and MAb production (,) were monitored. The culture with Hybridoma-SFM produced significantly more MAbs even though the number of cells was similar to serum-supplemented medium.*

OPTIMAb® Monoclonal Antibody Production Enhancer

A protein-free, 100X concentrated nutrient supplement that can be used to boost MAb production dramatically, OPTIMAb® includes an alternate carbon source, supplemental amino acids, lipids and other medium components optimized to ensure maximum MAb yield.

Adding OPTIMAb® concentrate to batch hybridoma cultures following achievement of maximum cell density, prior to decrease in cell viability, has been shown to increase MAb yields by as much as 200% over supplemented cultures. This versatile concentrate is effective with all hybridoma cell lines grown in any serum-free or serum-supplemented medium.