

# CDM4MAb

## HYCLONE MEDIA AND SUPPLEMENTS

HyClone™ CDM4MAb is a chemically defined and animal-derived component-free (ADCF) medium. This regulatory-friendly medium is developed through the HyClone Metabolic Pathway Design process (see box) to increase process yields for the manufacture of antibodies and antibody fragments for therapeutic use in a variety of engineered hybridoma and myeloma cell lines.

CDM4MAb medium has been successfully tested in a variety of culture systems, including T-flasks, shaker flasks, and bioreactors including fed-batch and perfusion cultures. CDM4MAb medium does not contain phenol red and is available with or without L-glutamine and poloxamer 188. CDM4MAb is available in liquid and powder formats in user-friendly packaging (Fig 1).

Key features of CDM4MAb medium include

- Animal-derived component-free
- Chemically defined formulation
- Designed for high cell yield and monoclonal antibody (MAb) production
- Allows for direct or sequential adaptation
- Component traceability
- Manufactured according to cGMP guidelines

## Specifications

- Does not contain phenol red
- CDM4MAb liquid medium is available with poloxamer 188, with or without L-glutamine
- CDM4MAb powder medium does not contain L-glutamine, sodium bicarbonate, or poloxamer 188
- Store medium at 2°C to 8°C, away from light
- Powder medium should be stored protected from moisture in a tightly sealed container



**Fig 1.** CDM4MAb medium is available as liquid or powder in pack sizes suitable for small-volume cell culture as well as large-scale bioprocessing applications.

### Metabolic Pathway Design process

An optimal cell culture process is dependent on a variety of factors, such as cell line, specific clones, media, and feeds, as well as processes to maximize viable cell densities and productivity. Our experts in medium design and development know and understand these factors at the metabolic level. They evaluate each metabolic profile, understanding nutritional demands and waste creation, to make sure the correct nutrient type and quantity is used to minimize waste and resultant cell toxicity. Our experts use their understanding of metabolic pathways to optimize media for enhanced viable cell densities and productivity. Once the medium has been optimized using this Metabolic Pathway Design process, our scientists can help you devise an effective cell culture strategy using a combination of media and feeds to further enrich productivity and reduce process inefficiencies.

## Suggested preparation

### Reconstitution of CDM4MAb powder medium

1. While stirring, add 19.55 g/L of CDM4MAb powder medium to cell culture-grade water at 90% of final preparation volume. If your water source is normally cool, it may be useful to adjust the water temperature. Using warmer room temperature water (22°C to 25°C) will improve solubilization time. Mix for 20 min or until dissolved.
2. Add 0.5 g/L poloxamer 188 and 3.2 g/L sodium bicarbonate. Minimum mixing time: 20 min.
3. Bring vessel to final volume with cell culture-grade water. Allow solution to mix for 10 to 20 min.
4. Check pH and osmolality. Expected values:
  - pH 7.0 to 7.4
  - Osmolality 280 to 320 mOsm/kg
5. Sterile filter into desired container using a 0.2 µm sterile filter.

### Preparation notes

CDM4MAb powder medium does not contain L-glutamine. Recommended concentration: 6 mM.

## General culture recommendations

1. Cultures should be incubated at 37°C in a 5% CO<sub>2</sub> environment.
2. The caps on culture flasks should be loosened and adequate vessel headspace should be given to provide gas exchange.
3. Seeding densities should be ~ 2.0 × 10<sup>5</sup> cells/mL. Cells should typically be subcultured every 2 to 4 days, as necessary.

### Direct adaptation

1. Transfer cells grown in current medium directly into CDM4MAb medium at 2.0 × 10<sup>5</sup> cells/mL. Note: increasing the seeding density at the onset of adaptation can improve success ratios.
2. When viable cell density reaches 1.0 to 1.5 × 10<sup>6</sup> cells/mL, subculture the cells.
3. Cells should be subcultured every 48 to 96 h.
4. If cell viability drops below 80%, proceed to sequential adaptation.

### Sequential adaptation

1. Transfer cells grown in current medium into CDM4MAb medium at a ratio of 1:1 using a seeding density of 2.0 × 10<sup>5</sup> cells/mL.
2. Incubate culture until two population doublings are observed. Subculture cells by mixing equal volumes of cell suspension in conditioned medium and fresh CDM4MAb medium (1:1 ratio).
3. Continue to subculture the cells using this method until the previously used medium is reduced below 0.05% concentration and cell viability is > 85%.

### Cryopreservation

CDM4MAb medium adapted cells can be cryopreserved in a medium consisting of a 1:1 ratio of fresh and conditioned CDM4MAb medium. To this mixture, add DMSO to a final concentration of 7.5%.

## Quality control testing

Quality control test specifications are listed in Table 1.

**Table 1.** Test specifications<sup>1</sup>

Appearance	Clear solution
Osmolality	280 to 320 mOsm/kg
pH	7.0 to 7.4
Sterility	No growth (bacteria or fungi)
Endotoxin	≤ 1.0 EU/mL <sup>1</sup>
Application	Growth promotion

<sup>1</sup> Refer to certificate of analysis for actual results.

## Custom production

Formulations and delivery systems can be customized to your specific process requirements or optimized to maximize process yields.

### Rapid Response Production (RRP)

Our RRP program manufactures up to 200 L of your custom prototype formulation within seven working days of your request. Use our RRP service to expedite the development and testing of custom buffers and process liquids for your biopharmaceutical manufacturing process.

**Table 2.** Supplement matrix

	Amino acids	Vitamins	Glucose	Trace elements	Growth factors	Hypoxanthine/ thymidine	ADCF* lipids	ADCF* cholesterol	Suitable for	Code number
Cell Boost 1 Supplement (R05.2)	•	•	•						HEK293 CHO	SH30584
Cell Boost 2 Supplement (R15.4)	•		•						PER.C6™ CHO	SH30596
Cell Boost 3 Supplement (JM3.5)	•	•	•	•		•			Hybridoma Myeloma	SH30825
Cell Boost 4 Supplement (PS307)	•	•	•	•	•		•	•	CHO	SH30857
Cell Boost 5 Supplement (CN-F)	•	•	•	•	•	•	•	•	Hybridoma NS0 HEK293 CHO	SH30865
Cell Boost 6 Supplement (CN-T)	•	•	•	•	•	•	•	•	T-Cells Hybridoma NS0 HEK293 CHO	SH30866
LS250 supplement							•	•	NS0	SH30554
LS1000 supplement								•	NS0	SH30555

\* Animal-derived component-free

## Related products

Table 2 gives an overview of HyClone supplements.

### **HyClone Cell Boost kit**

Cell Boost™ Process Supplements (100 g each) contain samples of supplements designed to increase cell productivity in a variety of cell lines (Table 2). Each supplement is developed through the Metabolic Pathway Design process and is chemically defined and protein-free with no animal derived components.

### **HyClone LS250 supplement**

LS250 is a chemically defined, animal-derived component-free lipid supplement developed to stimulate cell growth and MAb production in NS0 cell cultures using traditional hybridoma serum-free media.

### **HyClone LS1000 supplement**

LS1000 supplement is a chemically defined, animal-derived component-free lipid supplement developed to stimulate cell growth and MAb production in NS0 cell cultures using traditional hybridoma serum-free media.

The supplement is formulated using a proprietary complexing process for enhanced cholesterol delivery. LS1000 has been successfully tested in a variety of serum-free medium cultures, including HyClone CDM4NS0 and CDM4MAb media.

## Ordering information

CDM4MAb medium is manufactured in homogenous liquid lot sizes up to 10 000 L and powder lots up to 250 000 L.

Product	Size	Product code
HyClone CDM4MAb liquid medium With L-glutamine With poloxamer 188	500 mL bottle	SH30801.01
	1000 mL bottle	SH30801.02
	5 L bag	SH30801.03
	10 L bag	SH30801.04
	20 L bag	SH30801.05
	50 L bag	SH30801.06
	100 L bag	SH30801.07
	200 L bag	SH30801.08
	500 L bag	SH30801.09
	HyClone CDM4MAb liquid medium Without L-glutamine With poloxamer 188	500 mL bottle
1000 mL bottle		SH30802.02
5 L bag		SH30802.03
10 L bag		SH30802.04
20 L bag		SH30802.05
50 L bag		SH30802.06
100 L bag		SH30802.07
200 L bag		SH30802.08
500 L bag		SH30802.09
HyClone CDM4MAb powder medium Without L-glutamine Without poloxamer 188	1 × 5 L*	SH30800.01
	1 × 10 L*	SH30800.02
	1 × 50 L*	SH30800.03
	1 × 100 L*	SH30800.04
	1 × 500 L <sup>†</sup>	SH30800.05
	1 × 1000 L <sup>†</sup>	SH30800.06

\* High-density polyethylene (HDPE) bottle

<sup>†</sup> Polybag/pail

Related products	Size	Product code
HyClone Cell Boost kit	6 × 100 g	SH30890
HyClone LS1000 cholesterol supplement	50 mL bottle	SH30554.01
	100 mL bottle	SH30554.02
	500 mL bottle	SH30554.03
	1000 mL bottle	SH30554.04
HyClone LS250 lipid supplement	100 mL bottle	SH30555.01
	500 mL bottle	SH30555.02
	1000 mL bottle	SH30555.03

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