Glycan supplement

HYCLONE™ MEDIA AND SUPPLEMENTS

HyClone™ glycan supplement is a serum-free, animal component-free, chemically defined galactosylation cell culture supplement for modulation of monoclonal antibody (mAb) glycan profiles in CHO cells. It's designed to increase galactosylation in CHO cell proteins while maintaining overall culture performance.

Glycosylation profiles are key quality attributes for mAbs, influencing function, stability, half-life, and immune activity. Biosimilar development requires close matching of reference glycan patterns. Target outcomes typically include increased galactosylated species (G1F, G2F) and controlled levels of high mannose residues.

Key features of HyClone glycan supplement:

- Increases galactosylation levels in CHO cell derived proteins
- Maintains cell growth, viability, and titer across multiple CHO cell lines
- Has minimal effect on product quality attributes such as charge variants, aggregates, and fragments
- Fully compatible with platforms using HyClone ActiPro™ cell culture medium with Cell Boost™ supplements 7a and 7b
- Demonstrates robust glycosylation performance across different basal media types
- Shows comparable or superior performance to marketed glycosylation supplements (EX-CELL Glycosylation Adjust (Gal+) [Millipore Sigma] and BalanCD Gal supplement [FUJIFILM Irvine Scientific])

Fig 1. HyClone glycan supplement is available in liquid form in pack sizes suitable for small-volume cell culture as well as large-scale bioprocessing applications.

Growth and productivity

We monitored cell growth, viability, and protein titer in fed-batch culture to evaluate the impact of glycan supplementation on overall culture performance in CHO-M, CHOK1 GS, and CHO DG44 cell lines. For this we evaluated HyClone glycan supplement, EX-CELL Glycosylation Adjust (Gal+), and BalanCD Gal supplement against non-supplemented control conditions (ActiPro medium + Cell Boost supplements 7a and 7b). We found that growth kinetics, viable cell density (VCD), and viability were comparable between cultures grown with HyClone glycan supplement and controls (Fig 2). Productivity profiles showed that addition of HyClone glycan supplement resulted in similar titers (approximately 90%) to those of control conditions across all cell lines (Fig 3).

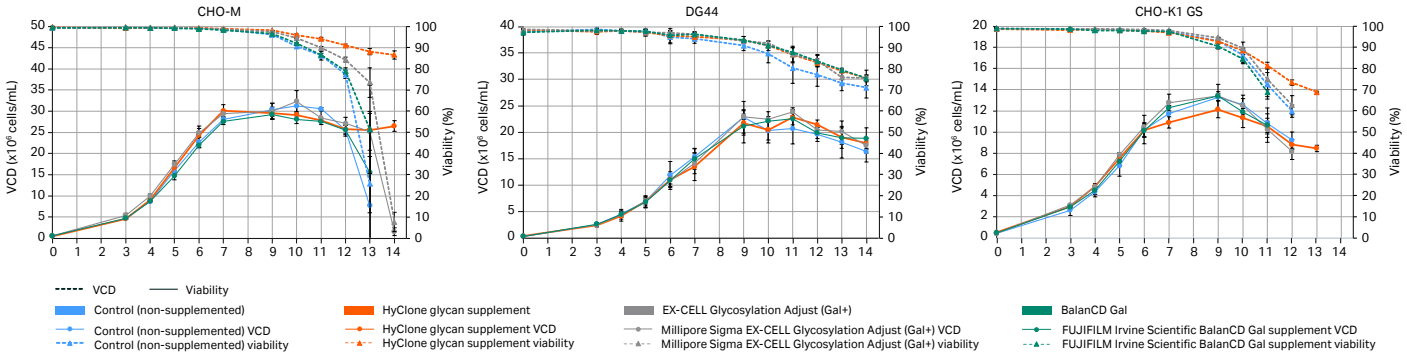

Fig 2. Growth kinetics, VCD, and viability in CHO-M, CHOK1 GS, and DG44 cell lines supplemented with HyClone glycan supplement, EX-CELL Glycosylation Adjust (Gal+) (Millipore Sigma), or BalanCD Gal supplement (FUJIFILM Irvine Scientific) vs control (unsupplemented) conditions. For most time points, VCD and viability were comparable between conditions for CHO-M, DG44, and CHO K1 GS cells by Dunnett's test, with statistically significant ($p < 0.05$) improvements restricted to late culture. The supplemented CHO K1 GS culture showed increased viability at day 13 ($p < 0.05$), enabling extension to day 14, while the supplemented CHO-M cell line exhibited significantly improved viability from day 11 onward ($p < 0.05$). Data are shown as mean ± SD ($n = 3$ independent shake flask runs per condition).

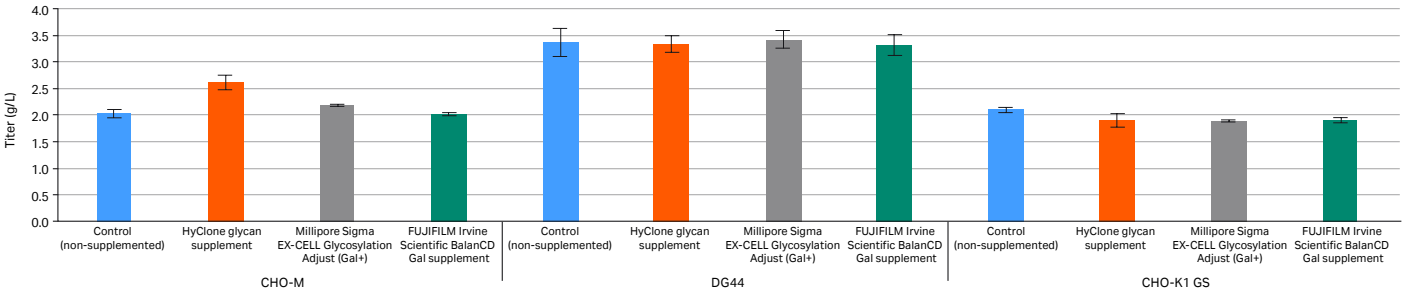

Fig 3. Peak productivity in CHO-M, CHOK1 GS, and DG44 cell lines supplemented with HyClone glycan supplement, EX-CELL Glycosylation Adjust (Gal+) (Millipore Sigma), or BalanCD Gal supplement (FUJIFILM Irvine Scientific) vs control conditions. Data are presented as mean ± SD from 3 independent shake flask runs per condition. Statistical analysis was performed separately for each cell line using one way ANOVA. For CHO-M, the supplement significantly increased peak titer relative to control and competitor supplements ($p < 0.05$). For DG44, peak titers were comparable across supplement, control, and competitor conditions, with no statistically significant differences observed. In CHO K1 GS cultures, supplementation resulted in a modest but significant decrease in peak titer relative to control ($p < 0.05$).

Glycosylation profiles

We analyzed full N linked glycan profiles in CHO-M, CHO K1 GS, and DG44 cell lines to assess the effect of glycan supplementation on glycan distribution. Quantification focused on glycoforms known to influence antibody stability and functional activity, enabling evaluation of shifts toward desired glycosylation patterns. We found that HyClone glycan supplement minimally affected G0, reduced G0F, increased G1F and G2F, and maintained Man5 levels relative to control conditions in all three cell lines (Fig 4).

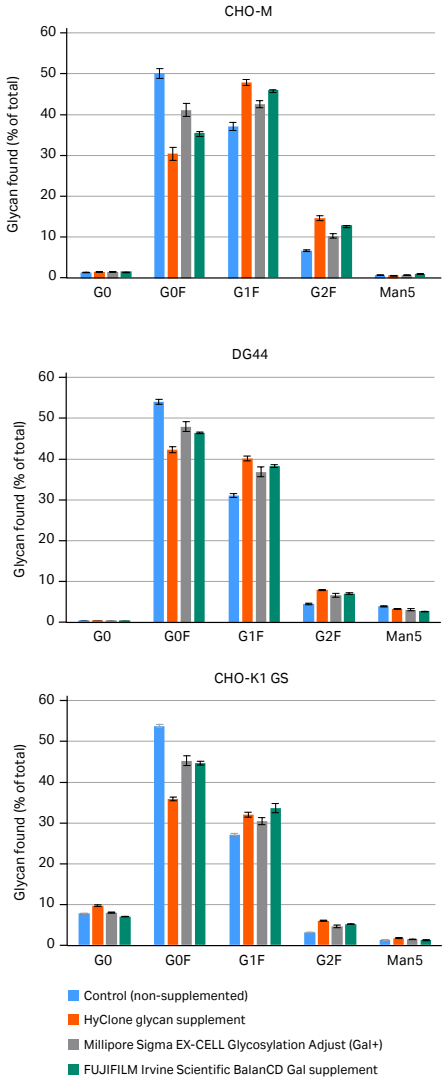

Fig 4. Glycosylation profiling showed that the HyClone glycan supplement increased galactosylation of mAbs produced by CHO-M, CHO K1 GS, and DG44 cell lines. Data represent three biological replicates (n = 3). Supplementation significantly decreased G0F and increased G1F and G2F species across all cell lines ($p < 0.0001$).

HyClone glycan supplement summary

Across CHO-M, CHO K1 GS, and DG44 cell lines, the HyClone glycan supplement enables targeted increases in galactosylation while preserving overall culture performance. Growth, viability, and productivity remain comparable to control (unsupplmented) conditions. The supplement increases levels of galactosylated species (G1F and G2F) while keeping key product quality attributes stable. These results confirm compatibility with standard fed batch processes and support its intended use for controlled glycosylation modulation.

Specifications

Parameter	Specification
Appearance	Clear, colorless solution
pH	7.0–7.4 (FIO*)
Osmolality	285–325 mOsm/kg (1:4 dilution)
Sterility	No growth (bacteria or fungi)
Endotoxin	< 1.0 EU/mL

* For information purposes only. As the product's buffering capacity is limited, pH can vary depending on handling and operational conditions.

Product handling

Store the product at 2°C to 8°C and protect from light.

Related products

Product	Size	Packaging	Product code
ActiPro medium, dry powder	5 L	Bottle	SH31037.01
	10 L	Bottle	SH31037.02
	25 L	Bottle	SH31037.05
HyClone ActiPro medium, liquid	500 mL	Bottle	SH31039.01
	1000 mL	Bottle	SH31039.02
	1 L	Bag	SH31039.03
HyClone Cell Boost supplement 7a, liquid	500 mL	Bottle	SH31119.01
	1000 mL	Bottle	SH31119.02
	1 L	Bag	SH31119.03
	5 L	Bag	SH31119.04
	10 L	Bag	SH31119.05
	20 L	Bag	SH31119.06
	50 L	Bag	SH31119.07
	100 L	Bag	SH31119.08
	200 L	Bag	SH31119.09
HyClone Cell Boost supplement 7a, powder	1 L	Bottle	SH31026.07
	5 L	Bottle	SH31026.01
	10 L	Bottle	SH31026.02
	25 L	Bottle	SH31026.07
HyClone Cell Boost supplement 7b, liquid	100 mL	Bottle	SH31120.01
	500 mL	Bottle	SH31120.02
	1000 mL	Bottle	SH31120.03
	1 L	Bag	SH31120.04
	5 L	Bag	SH31120.05
	10 L	Bag	SH31120.06
	20 L	Bag	SH31120.07
	50 L	Bag	SH31120.08
	100 L	Bag	SH31120.09
	200 L	Bag	SH31120.10
HyClone Cell Boost supplement 7b, powder	0.5 L	Bottle	SH31027.01
	1 L	Bottle	SH31027.07
	5 L	Bottle	SH31027.02
	10 L	Bottle	SH31027.04

Ordering information

Product	Size	Packaging	Product code
HyClone glycan supplement	100 mL	Bottle	SH31210.01
	1000 mL	Bottle	SH31210.02

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