

Driving High-Density CHO-K1 Production and Reliable Scale-up with the TheraPRO[®] CHO Media System

Lonza
Specialized Modalities

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Abstract

The TheraPRO[®] CHO Media System is a chemically defined, non-animal origin (NAO) platform designed to simplify upstream bioprocessing while delivering high productivity and robust scalability in CHO-K1 and CHO-GS cell lines.

In this study, TheraPRO[®] CHO Production Medium and Feed enabled consistent high-density CHO-K1 cultures with sustained viability throughout a 15-day fed-batch process. Cultures achieved significantly higher viable cell densities and antibody titers compared with leading commercial CHO media, while maintaining tight control over key quality attributes, including reduced host cell protein (HCP) levels.

The system's streamlined, easy-to-use powder formulation supports reproducible scale-up from early development to commercial manufacturing, minimizing process variability and operational complexity. Together, these results demonstrate that the TheraPRO[®] CHO Media System helps biomanufacturers accelerate development timelines, reduce scale-up risk, and deliver consistent product quality for antibody-based therapeutics.

Material and methods

CHO media development activities were carried out in high-throughput microbioreactor-based models using response surface methodology. Furthermore, the media formulations were evaluated in 10 – 200 L bioreactors to assess the scalability of Lonza's platform processes. The performance of the newly developed TheraPRO[®] CHO Media System was then evaluated and compared against commercially available competitor CHO media systems by assessing protein titer and viable cell concentration.

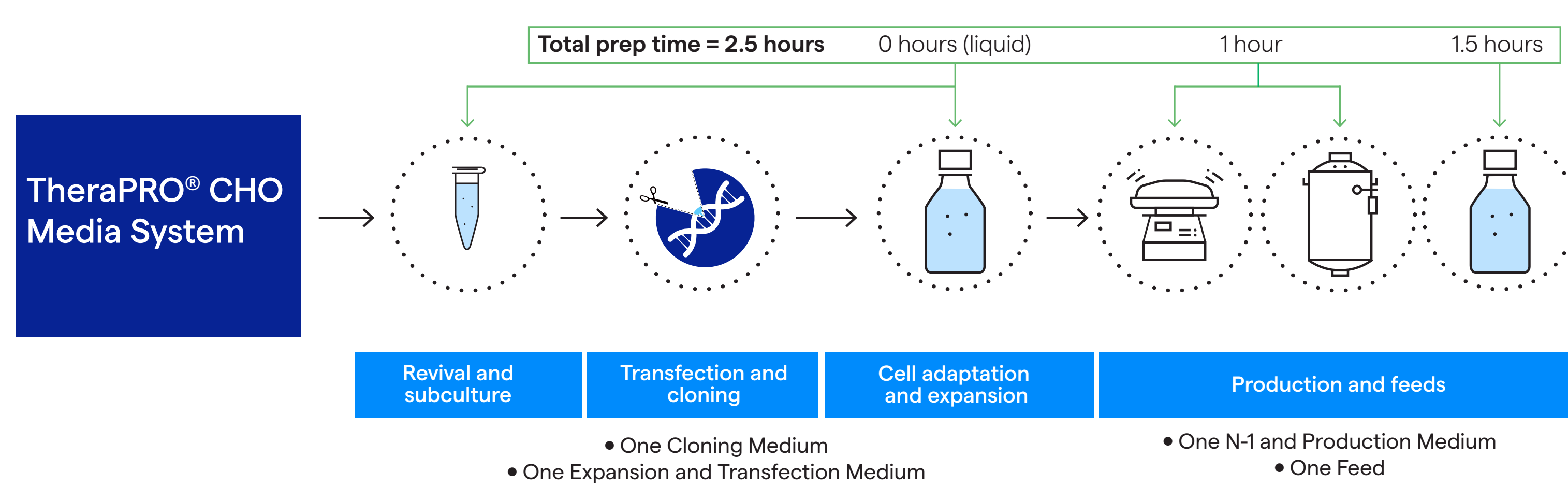


Figure 1. TheraPRO[®] CHO Media System streamlines cell line development and protein production, reducing preparation time and enhancing workflow efficiency.

Results

TheraPRO[®] Media enhances CHO-K1 performance

Using the TheraPRO[®] CHO Media System, CHO-K1 cultures routinely reached viable cell densities above 25×10^6 cells/mL while maintaining > 90 % viability throughout a 15-day fed-batch process, performance that surpassed leading commercial media. These high-density runs produced elevated mAb titers with tightly controlled quality attributes: aggregation < 1 %, high-mannose glycans < 5 %, purity > 80 %, monomer content > 95 %, and a main charge isoform > 50 %. These data demonstrate that TheraPRO[®] delivers exceptional productivity and consistent product quality in CHO-K1 production runs.

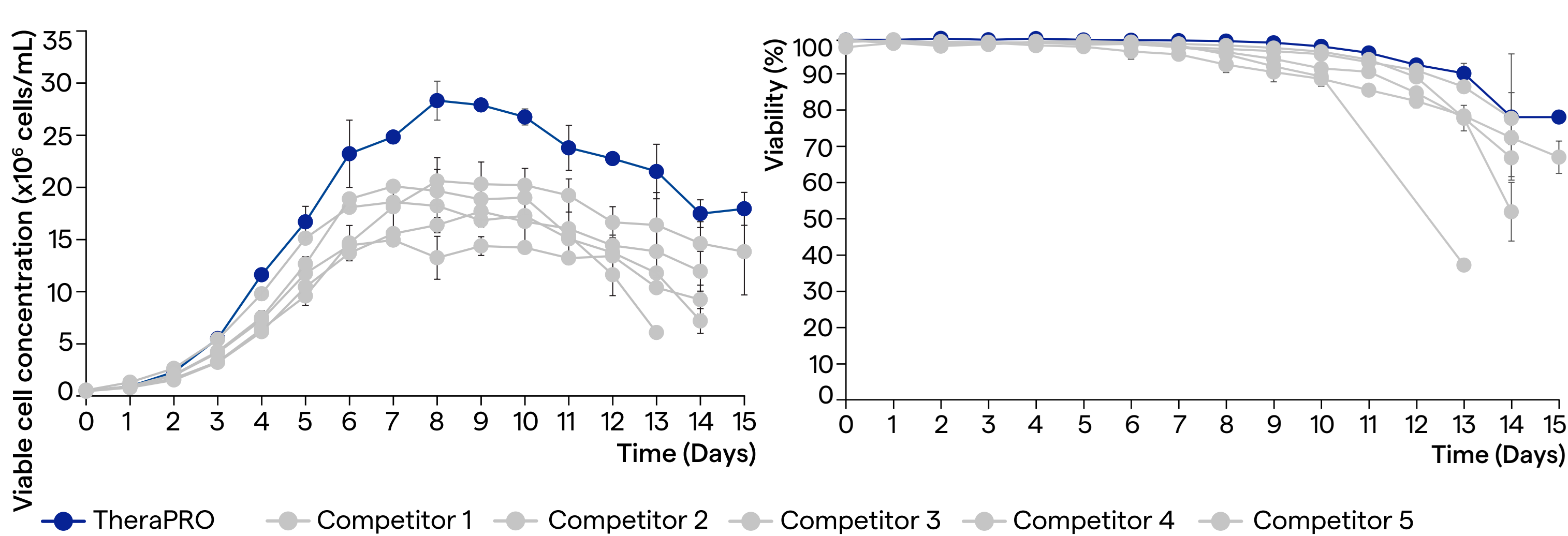


Figure 2. Viable cell concentration and culture viability of TheraPRO[®] CHO Media System versus competitor media systems.

TheraPRO[®] Media achieve high titers in CHO-K1 cells

Over a 15-day fed-batch run, the TheraPRO[®] CHO Media System consistently outperformed competing media, pushing titers above 5 g/L, while competitor formulations stalled below 2 g/L under identical conditions.

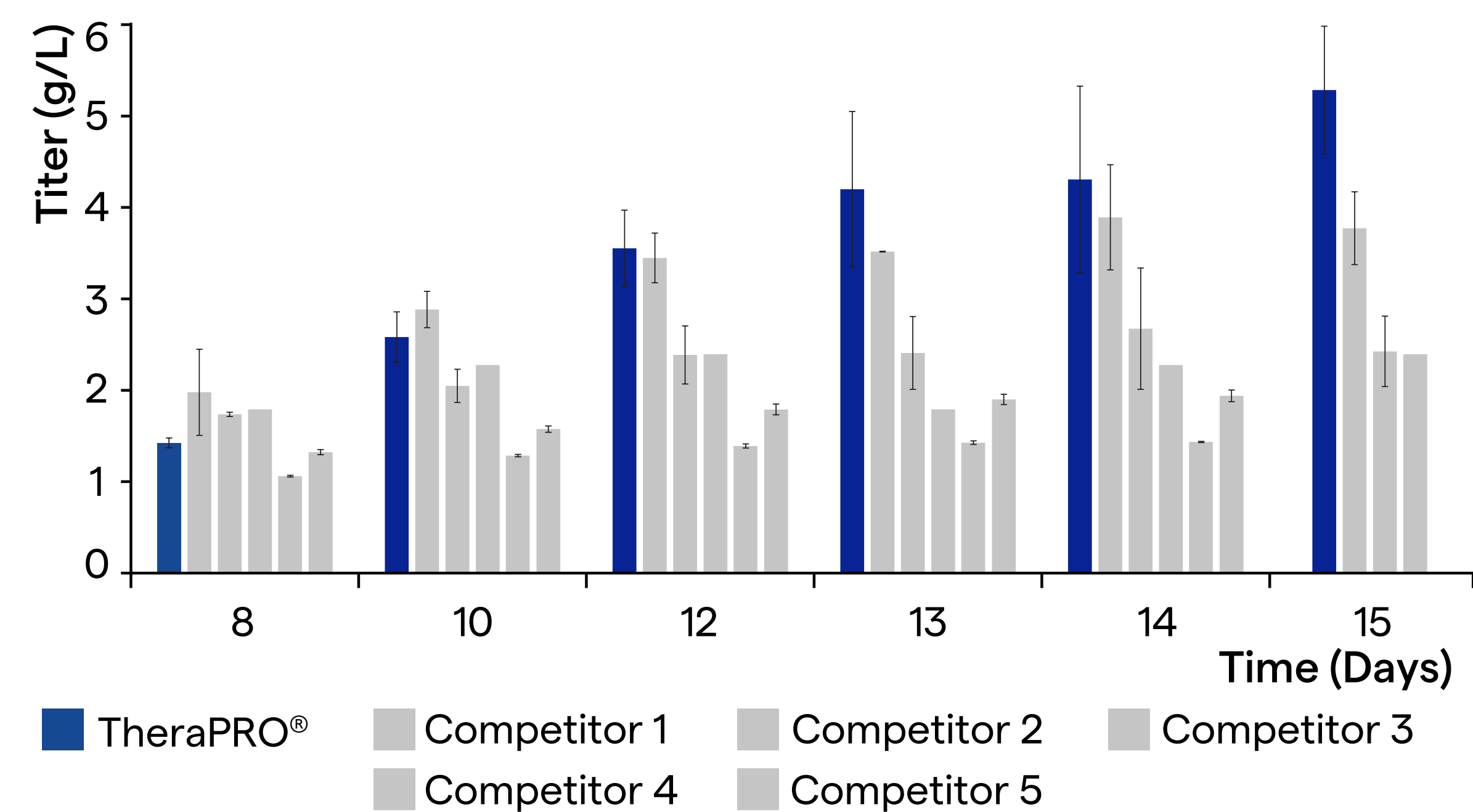


Figure 3. Protein titer of TheraPRO[®] CHO Media System vs competitor media systems

TheraPRO[®] Media: Scalable, consistent CHO-K1 performance

The TheraPRO[®] CHO Media System delivers robust, high-yield results across bioreactor volumes from 10 L to 200 L, demonstrating scalable performance that reinforces Lonza's platform reliability and streamlines workflows at every production stage. In addition, TheraPRO[®] CHO Media system showed remarkable consistency in glycans profiles at different scales.

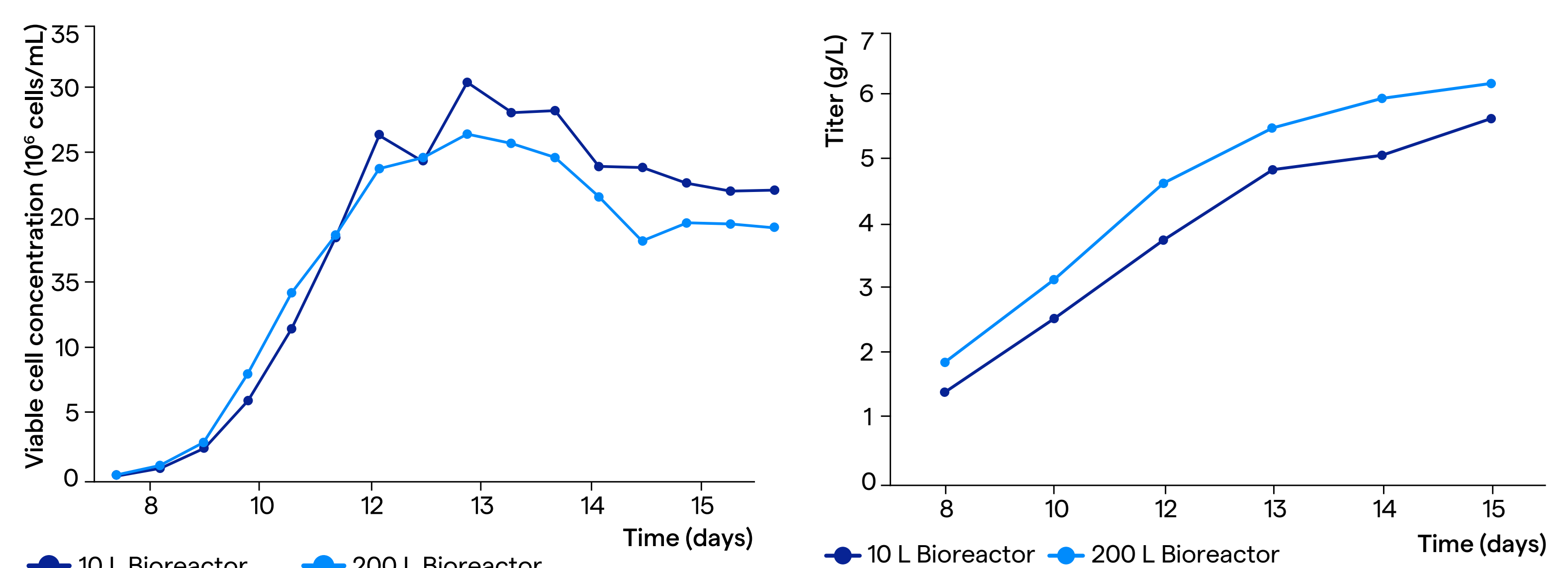


Figure 4. Protein titer at different scales using the TheraPRO[®] CHO Media System

Protein quality

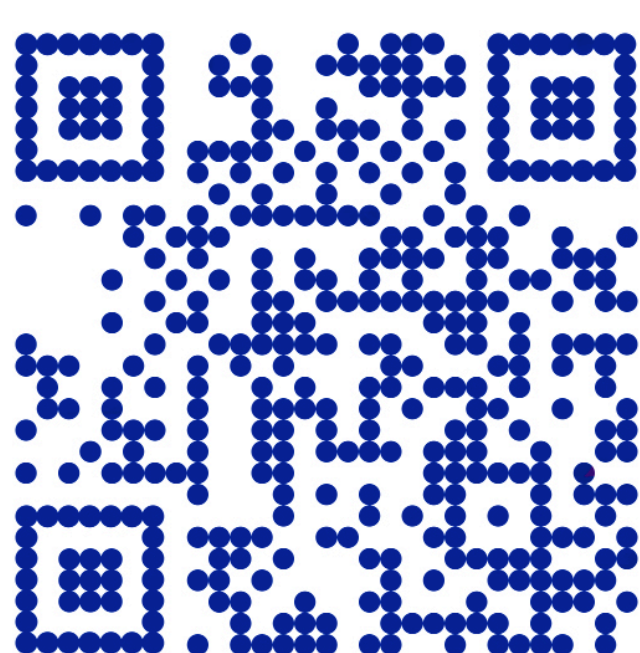
Culture scale	Analytical methods	% G0F	% G1Fa	% G1Fb	% G0	% G2F	% G2	% Man5
10 L	HILIC-FLR	50.34	12.10	12.10	11.19	6.56	0.30	1.05
200 L		52.82	13.02	11.08	7.88	6.34	0.18	1.12

Figure 3. Protein titer of TheraPRO[®] CHO Media System vs competitor media systems

Conclusion

The chemically defined, non-animal origin (NAO) TheraPRO[®] CHO Media System provides an easy-to-use platform for both CHO-K1 and CHO-GS cultures, consistently delivering high titers while preserving critical product quality attributes. Its performance remains robust and reproducible from small-scale development through 200 L production, confirming exceptional scalability and process reliability.

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free sample
today.



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TheraPRO[®] CHO Media System is suitable for GMP manufacturing. These products are not for human or animal in vivo or diagnostic use, including use as a diluent or as an excipient. It is the end user's responsibility to ensure full compliance with applicable regulations based on their use of Lonza's products in their specific process. All [TheraPRO[®]/PowerCHO[®]/ProCHO[®]] products are produced according to applicable GMP standards. Lonza Group Ltd. and its affiliates (collectively and individually, "Lonza") make efforts to include accurate and up-to-date information. However, Lonza makes no representations or warranties, express or implied, including as to accuracy or completeness of information. All trademarks belong to Lonza, and are registered in the USA, EU and/or CH, or used in common law, or belong to third-party owners and are used for only informational purposes. All third-party copyrights have been reproduced with permission from their owners. The user bears the sole responsibility for determining the existence of any third-party rights and obtaining any necessary licenses and approvals. For more information, including regarding legal disclaimers, Lonza's intellectual property rights, and how Lonza collects, uses and protects personal information: www.lonza.com/legal, <https://www.lonza.com/about-us/strategy/intellectual-property> and www.lonza.com/privacy. ©2026 Lonza, Inc. All rights reserved. ME-PO002 02/26