Investor Newsletter July 2023: Protein / Biologics CDMOs

Key Innovations Differentiating Protein / Biologics CDMOs in a Growing Market

Within the growing CDMO space, manufacturing capabilities and efficiencies which support development of complex, innovative proteins and biologics remains increasingly pertinent and relevant in the market

ADCs are a significant growth category in pharma and biotech; however, they are highly complex to manufacture given risks of losing target specificity during the payload conjugation process, thus creating opportunity for ADC-focused CDMOs to develop differentiated capabilities and infrastructure to overcome these challenges

Continuous manufacturing requires deep understanding of complex processes; such capabilities vastly reduce manufacturing costs and time, while also having more flexible scale-up; particularly important in the biosimilars space

Growing Demand for CDMOs with Innovative Capabilities and Specialty Expertise

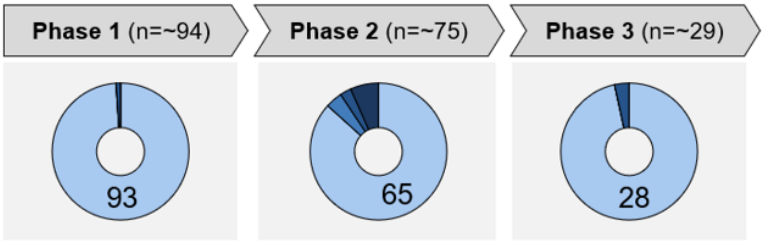
By 2025, ~50% of small molecule and biologics development within biopharma is expected to be outsourced to CDMOs. Demand for outsourcing is driven by continued growth of the innovative protein / biologics market (e.g., antibody drug conjugates, multi-specific antibodies), manufacturing difficulties and costs associated with innovative modalities, and the shortage of trained staff with expertise in producing high-quality biologics under GMP conditions.

In the specialized protein / biologics fields, effective CDMOs provide expertise that enable larger pharma and smaller biotech innovators to bring specialized products to the market more successfully and profitably.

Antibody Drug Conjugates (ADCs)

ADCs are a growing class of innovative cancer therapies combing target specificity of monoclonal antibodies with cancer-killing drugs, enabling cell-specific drug delivery. They are distinctly complex, requiring that the appropriate targeted antibody, a chemically stable linker, and the highly potent cytotoxic drugs be brought together in the correct conformation. Investment in ADC R&D is growing rapidly, with 200+ assets in development and a global market size expected to expand up to 15% a year between now and 2032, much faster than that of the broader protein / biologics class and overall oncology market. Large pharma such as Pfizer (through its acquisition of Seagen) and Daiichi Sankyo, along with emerging biotechs including ADC Therapeutics, ImmunoGen, and Mersana Therapeutics, have demonstrated a strong commitment to ADC-focused research and development.

FIGURE 1 - Overview of Global ADC Asset Pipeline



Therapeutic Area	P3/PR	P2	P1
Oncology	93	65	28
Musculoskeletal Disorders	0	3	0
Metabolic Disorders	1	2	1
Other	0	5	0

The clinical development pipeline indicates substantial ADC R&D focused primarily on oncology indications.
Source: GlobalData.

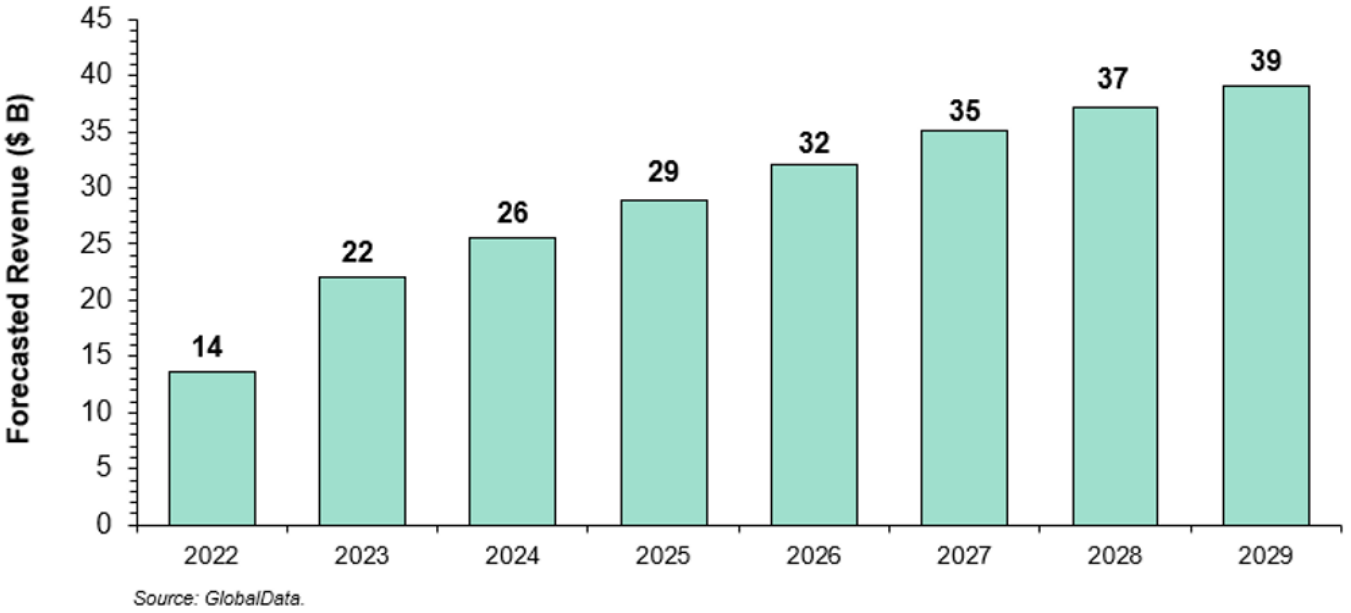
Given ADCs are formed by conjugation of a monoclonal antibody to highly toxic payload drugs via a molecular linker, they pose unique challenges to large-scale production and require strict adherence to cGMP production guidelines. The technology and linker chemistry required for successful ADC production is significantly more complex than for traditional protein / biologics, therefore specialized capabilities and expertise are required.

New payload, linker, and conjugation technologies are continuously emerging (e.g., optimizing drug-to-antibody ratio (DAR), site-specific conjugation, higher potency), thus increasing the expertise and technology required for successful development and manufacturing of ADCs. CDMOs with specialized, proprietary technology platforms are best equipped to overcome manufacturing challenges associated with ADCs while being positioned for growth, as emerging and established biopharma players selectively partner with innovating CDMOs to fill capability gaps and meet capacity demands. Innovative, full-service ADC CDMOs offering end-to-end services (e.g., fill and finish, testing capabilities) will likely experience elevated demand due to their breadth of capabilities across the value chain.

Continuous Manufacturing (CM)

The biosimilars market – currently valued at ~$14 B – is poised to demonstrate significant growth in the near-term fueled by the advent of high-impact biosimilars (e.g., adalimumab, ustekinumab), and is expected to reach ~$39 B by 2029. Reducing manufacturing costs is a key focus for many of the biosimilar players. Continuous manufacturing approaches are emerging which have the potential to vastly reduce manufacturing costs.

FIGURE 2 - Biosimilars YoY Forecasted Revenue



Manufacturing of biologics has utilized "traditional" batch methods to produce proteins / biologics, but CM has emerged as a potent differentiator to develop these complex molecules more rapidly and cost-effectively. Batch manufacturing consists of multiple discrete steps, each with its own distinct quality control processes. Though it requires more complex manufacturing processes and robust quality control strategies, CM integrates development of proteins / biologics into a nonstop and end-to-end (E2E) process with built-in quality control monitoring.

Due to this integration, CM of proteins / biologics can have multiple benefits over batch manufacturing in terms of time to manufacture, costs, and adaptability to product demand. The continuous process saves time by circumventing hold times between batches or delays from quality control. Without hold times, add-on expenses such as batch maintenance, storage, and shipping may be removed while reduction of waste and batch heterogeneity simultaneously decrease costs (e.g., the omalizumab biosimilar from Biosana has demonstrated up to 10x lower COGS). Lastly, necessary adjustments in product output can be linearly scaled (e.g., omalizumab biosimilar from Biosana may be scaled up 40x from 50 L to 2000 L production) from process development to commercial manufacturing under GMP conditions. Significant reductions in manufacturing costs and increases in throughput will create new ways to play and compete for protein/ biologics CDMOs.

Emerging CDMOs Represent Near-term Investment Opportunities

CDMO consolidation, expansion, and M&A activity was highly prevalent in 2022, with successfully completed deals reaching ~$475 M. Examples include Asahi Kasei Medical's acquisition of Bionova Scientific (financial terms of the transaction were not disclosed), a biologics CDMO with manufacturing capabilities for next-generation antibody drug production, and Asymchem Labs' acquisition of continuous manufacturing-focused CDMO SnapDragon Chemistry for ~$58 M. These developments underscored the importance of differentiating factors attuned to biopharma trends, such as ADC or CM capabilities, driving deal completion within the CDMO market.

With biopharma investment driving development of innovative therapies that address unmet medical needs, investment in protein / biologics CDMOs can support the technological innovations and upscaling necessary to overcome manufacturing challenges and deliver life-changing solutions to patients globally.

About ClearView Healthcare Partners

Founded in 2007, ClearView Healthcare Partners is a global strategy consulting firm serving the life sciences sector, with offices in Boston, New York, San Francisco, London, and Zurich ready to support clients in complex engagements with local expertise.

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About the author(s)

For more information on the content in this publication or to learn more about ClearView's advisory capabilities, please contact:

Sam Ulin
San Francisco
Sam.Ulin@clearviewhcp.com

Dean Griffiths
London
Dean.Griffiths@clearviewhcp.com

Alec Marchuk
New York
Alec.Marchuk@clearviewhcp.com

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