BioPlan associates, inc.

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23RD ANNUAL

Report and Survey of Biopharmaceutical Manufacturing Capacity and Production

TRENDS AND ANALYSIS FOR BIO/PHARMA INDUSTRY — 23 Years

A Study of Biotherapeutic Developers and Contract Manufacturing Organizations

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- Monika Birdi, Principal Product Manager for Advanced Therapies, SAP Americas
- Katrina Cordovado, MBDC, Business Development Manager, ENABLE Biotech
- Renaud Jacquemart, PhD, MBA, CEO, Omnium Global and Partner, BioPlan Associates
- Vadim Klyushnichenko, Ph.D., VP Bio/Pharmaceutical Development and Quality, Calibr-Skaggs Institute for Innovative Medicines (Scripps Research)
- Fran Lasowski, PhD, Chief Innovation Officer, Omnium Global
- Stefan Schmidt, PhD, CSO, Atlas Antibodies Group

We would also like to recognize our Institution Partners, and our Media Sponsors. Their efforts in assuring the cooperation and participation in the survey of their respective memberships helped guarantee the large group of survey participants to ensure data accuracy.

Our ***Institution Partners,*** all of whom contributed their time and effort to ensure the broad, international coverage of this project, include:

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- Pharma & Biopharma Outsourcing Association (PBOA) (Ringwood, NJ, USA)

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- American Pharmaceutical Review/Pharmaceutical Outsourcing (South San Francisco, CA, USA)
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The early participation of our authors and sponsors in evaluating the areas and trends to be surveyed this year ensured the project was designed to cover the most relevant issues in biopharmaceutical manufacturing today. As always, their continued support was critical to the success of the project.

Eric S. Langer, Publisher

ABOUT BIOPLAN ASSOCIATES, INC.

BioPlan Associates, Inc. is a biotechnology and life sciences market analysis, research, and publishing organization. We have managed biotechnology, biopharmaceutical, diagnostic, and life sciences research projects for companies of all sizes for over 30 years. Our extensive market analysis, research and management project experience covers biotechnology and biopharmaceutical manufacturing, vaccine and therapeutic development, contract research services, diagnostics, devices, biotechnology supply, physician office labs and hospital laboratory environments.

We prepare custom studies and provide public information our clients require to make informed strategic decisions, define objectives, and identify customer needs. With market information, our clients are better able to make informed, market-based decisions because they understand the trends and needs in high technology industries.

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METHODOLOGY

This report is the 23rd in our annual evaluations of the state of the biopharmaceutical manufacturing (bioprocessing) industry. The strength of this study's methodology remains in its breadth of coverage, which yields a composite view from the respondents closest to the industry, its 23-year longevity, industry familiarity and high response rates. These permit a consistent approach which delivers reliable data and analysis.

Note, "biopharmaceutical" here refers to the classic biotechnology-grounded definition: involving manufacture of pharmaceuticals using biotechnology/bioprocessing. The term does not refer to the entire pharmaceutical industry or just those parts considered innovative, with "biopharmaceutical" now simply commonly substituted where "pharmaceutical" or "drug" were formerly used.

This year, BioPlan Associates, Inc. surveyed 300 qualified and responsible individuals at biopharmaceutical manufacturers and contract manufacturing organizations in 21 countries plus 121 industry vendors and direct suppliers of materials, services, and equipment to this industry segment. Using a web-based survey tool, we obtained and evaluated information including regarding respondents' current capacity, production, novel technology adoption, human resources, quality, and outsourcing issues. We also assessed respondents' projected reasons for bottlenecks, and their perception of how these bottlenecks might be resolved.

This year, we continue to include new questions and chapters, including Artificial Intelligence Use and Applications, Continuous Bioprocessing and Process Intensification (Chapter 11.) Over the past few years, advances in technologies, platforms, expression systems, and single-use applications have increasingly made the bioprocessing segment an area of interest for such innovation.

We continue to partner with worldwide media and membership organizations to ensure a high response rate, and the most accurate overview of the worldwide biopharmaceutical industry and its bioprocessing sector. Our industry partners are cited in our acknowledgments section. In addition, to supporting this coverage, we also acknowledge our media partners, whose assistance enables us to reach the many high-quality respondents required for this quantitative survey and analysis.

Further information on methodology, breakouts on specific segments, and data from earlier surveys may be requested by contacting us at the address below.

Thank you for your participation and interest in this important research.

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CHAPTER 0: DEMOGRAPHICS

KEY TAKEAWAYS

This is the 23rd year that we are capturing the evolution of the biomanufacturing industry. In this report we provide an internationally recognized, data-rich analysis of the biomanufacturing industry's past and present and offer expert insights about its future.

- **Survey respondents held senior roles:** Survey respondents include bioprocess professionals whose roles extend into the most senior levels of strategic decision-making at global biopharmaceutical organizations.
- **Global professional opinions:** The 2026 edition of this report incorporates survey responses from professionals across 22 countries, reflecting a global perspective with insights spanning North America, Europe, Asia-Pacific, and other strategically important regions.
- **Respondents' involvement crosses all development phases of biomanufacturing** and offers a comprehensive coverage of expertise and opinions, from early-stage research through clinical trials and commercial production.
- **The facilities surveyed in this study make up a significant portion** of the overall global biomanufacturing industry.
- **Single-use bioreactor sizes increase:** A longitudinal review of the reviewed facilities shows an increase in average size of single-use bioreactors, as the industry continues to move toward larger, commercial-scale SUS capacities, including growth from 527 L SUS devices in 2018 to 880 L average size SUS bioreactors today.
- **Stainless steel systems are still actively used,** and at larger capacities than single-use bioreactors. Over the past 7 years, however, we have seen a plateau in the average size of stainless-steel bioreactors, at around 3600 L.

INTRODUCTION

This report presents a comprehensive analysis based on the insights of a global cohort of senior executives, technical leaders, and scientific experts engaged in biopharmaceutical development and manufacturing. Respondents span a wide range of organizational roles and company types, including both Contract Manufacturing Organizations (CMOs) and Contract Development and Manufacturing Organizations (CDMOs), in addition to biotherapeutic developers operating across diverse therapeutic areas.

This is the 23rd year that we continue to publish this internationally recognized research initiative. Our work has been serving as a benchmark for the biomanufacturing sector. The 2026 edition draws on survey resposes from professionals in 21 countries, capturing perspectives from

across North America, Europe, Asia-Pacific, and other key regions. This global reach ensures that the report reflects both the local nuances and shared global challenges that shape the biopharmaceutical industry today.

This report goes beyond general industry snapshots, we aim to include focused data segments. In Chapter 12 we include additional highlights from bioprocessing suppliers and technology vendors. Chapter 12 also offers additional insights into the supply-side dynamics influencing manufacturing strategy and innovation. As in prior years, participating organizations range in size, market focus, and development stage, but all respondents share direct involvement in bioprocessing and manufacturing operations ensuring a grounded, practical understanding of current trends.

The strength of this report lies in the diversity and depth of experience represented. Contributors include hands-on professionals actively managing and executing biopharmaceutical manufacturing operations in addition to decision makers and portfolio managers. Their collective input provides a real-time view of how the industry is evolving, where the most pressing challenges lie, and what strategic directions are gaining traction.

To support nuanced interpretation, responses are analyzed in aggregate and also by organization type, distinguishing between CMOs and innovator biotherapeutic manufacturers. This organizational segmentation allows for more targeted insight into how different stakeholders are navigating business drivers, risk exposure, capital investment decisions, and operational strategy.

This report aims to deliver a clear, data-driven view of the industry's current landscape and future outlook shaped by those at the forefront of biomanufacturing innovation and execution.

0-1 RESPONDENTS' AREA OF INVOLVEMENT

In the 2026 survey, the highest number of respondents reported direct involvement in 'large-scale cell culture production for therapeutic' use (17.2%) and in 'process development for biopharmaceutical manufacturing' (17.0%). These two areas have consistently represented the largest share of respondent roles throughout our longitudinal study, due to their central importance within the biomanufacturing ecosystem.

This trend is reflective of the broader industry landscape, where upstream production and process development remain foundational to biopharmaceutical success. 'Large-scale cell culture production for therapeutics' is the engine of commercial biologics manufacturing. Likewise, 'process development for biopharmaceutical manufacturing' plays a critical role in translating discovery into scalable, regulatory-compliant manufacturing, making it a focal point for innovation, investment, and staffing across organizations.

Following these organizational areas, in 2026, we report 8.3% of survey responders that belong primarily to 'scale-up (or clinical-scale) production for biopharmaceuticals primarily' and 7.4% to 'large-scale microbial fermentation for therapeutics'.

Similar to previous reports, a smaller percentage of survey responders belongs to 'other contract manufacturing (CMO) for pharmaceuticals' (2.1%) and 'fill/finish operations' (2.1%). These percentages are representative of the portion of biomanufacturing professionals in the facilities surveyed.

We note the remaining ~25% of survey respondents were vendors/suppliers and their responses are reported on Chapter 12 of this analysis.

For Ordering Information on the
Full Report
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Twenty-Third Annual Report and Survey of Biopharmaceutical Manufacturing Capacity and Production

Another report in the BioPlan Associates, Inc's biopharmaceutical series:

- Top1000 Global Biomanufacturing Facilities – Global analysis and ranking of capacity, employment, and pipelines, www.top1000bio.com
- Top300Bio CDMO Facility Index and Biomanufacturers Subscription Database – Global analysis and ranking of capacity, employment and pipeline for CDMOs, https://www.top300cdmo.com
- Growth of Biopharmaceutical Contract Manufacturing Organizations in China: An In-depth Study of Emerging Opportunities, 2020
- Top 60 Distributors of Bioprocessing Supplies in China: Opportunities for Global Biopharma Suppliers to Find and Manage Local Distributors in China, 2020
- Top 100 Biopharmaceutical Organizations in China, Online Database
- Advances in Biopharmaceutical Technology in China, 2nd Ed., Soc. Ind. Microbiology, Biotech
- Quick Guide to Clinical Trials, 2nd Ed., 2017
- Biosimilars Pipeline Database, http://www.biosimilarspipeline.com/index.html
- Biopharmaceutical Expression Systems and Genetic Engineering Technologies
- Advances in Biopharmaceutical Manufacturing and Scale-up Production, Amer. Soc. Micro.
- Biopharmaceutical Products in the U.S. and European Markets, 8th Ed.
- Advances in Biopharmaceutical Technology in India
- Top 60 Biopharmaceutical Organizations in India
- Quick Guide to Biotechnology in the Middle East
- Quick Guide to Biofuels

The 23rd Annual Report and Survey of Biopharmaceutical Manufacturing Capacity and Production is the most recent study of biotherapeutic developers and contract manufacturing organizations' current and projected future capacity and production. The survey includes responses from 300 responsible individuals at biopharmaceutical manufacturers and contract manufacturing organizations from 21 countries. The survey methodology includes input from an additional 121 direct suppliers of raw materials, services, and equipment to this industry. In addition to current capacity issues, this study covers downstream processing problems, new technologies, expression systems, quality initiatives, human resources and training needs of biopharmaceutical manufacturers, growth rates of suppliers to this industry, and many other areas.

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