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Bio-Manufacturing Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Workflow (Continuous Upstream Biomanufacturing, Single-Use Upstream Biomanufacturing, Downstream Biomanufacturing), By Application (Monoclonal Antibodies, Hormones, Vaccines, Recombinant Proteins, Others), By End User (Biopharmaceutical Companies, Research Institutions, CMOs/CDMOs), By Region and Competition

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Abstracts

The Global Bio-Manufacturing Market achieved a valuation of USD 19.08 Billion in 2022 and is poised for robust growth throughout the forecast period, with a projected Compound Annual Growth Rate (CAGR) of 7.72% and expected to reach USD 29.67 Billion through 2028. The bio-manufacturing market pertains to the biotechnology and pharmaceutical sector, encompassing the production of biological products such as biopharmaceuticals, cell therapies, gene therapies, vaccines, and other biologically derived products. This market covers the entire spectrum of activities, from design and development to scaling up and large-scale production, to cater to the needs of patients, healthcare systems, and research endeavors. Bio-manufacturing is a pivotal component of the biotechnology and pharmaceutical industry, contributing to the creation of life-saving and life-enhancing products. As technology and scientific knowledge continue to advance, the field of bio-manufacturing is expected to evolve, ushering in new therapies, improved production processes, and enhanced capabilities to meet the growing requirements of healthcare and patient needs.

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Key Market Drivers

Adoption of Advanced Technology and Innovation: The increasing geriatric population and prevalence of chronic respiratory disorders are projected to drive ventilator demand. The rise in awareness about lung cancer symptoms and the growing number of patients in medical facilities contribute to substantial growth in the ventilator market. However, it's important to consider potential risks associated with mechanical ventilation, such as increased infection risk and lung damage. Advanced technologies like automation, robotics, and process control systems can streamline biomanufacturing processes, reduce human errors, and enhance overall production efficiency. This can lead to faster turnaround times and increased production capacity, addressing the growing demand for biologics. Innovations in bioreactor design, single-use technologies, and flexible manufacturing platforms allow easier scalability of production. With increasing demand for bio-manufactured products, the ability to rapidly scale up production becomes essential. Continuous manufacturing approaches, as opposed to traditional batch processes, can lead to consistent product quality, reduced waste, and improved resource utilization. These advantages can drive demand for bio-manufactured products.

Rising Environmental Concerns: The global biomanufacturing market is set to grow due to mounting concerns about environmental issues, pollution, water scarcity, and seamless medication manufacturing services. Additionally, the implementation of next-generation biomanufacturing in plants will contribute to increased market demand. Furthermore, the adoption of a single-use product strategy will facilitate cost reduction, minimize product contamination, and enhance flexibility, driving demand for next-generation biomanufacturing. Heightened environmental awareness and worries about pollution have prompted industries, including biomanufacturing, to adopt more sustainable and environmentally friendly practices. This includes reducing waste generation, optimizing resource usage, and implementing cleaner manufacturing processes. As biomanufacturing aims to minimize its environmental footprint, the demand for eco-friendly biomanufacturing processes and products is expected to rise. Water scarcity is a pressing global issue that affects various industries, including biomanufacturing. Implementing water-efficient manufacturing processes and recycling technologies can help alleviate water scarcity concerns while maintaining the production of biopharmaceuticals and other biologically derived products.

Increasing Number of Biopharmaceutical Businesses: During the forecast period, the growth of the next-generation biomanufacturing market is expected to be driven by the

increasing number of biopharmaceutical companies worldwide. The need for advanced biomanufacturing to meet patient demands is likely to fuel the progress of the next-generation biomanufacturing industry. The global biopharmaceutical industry has been experiencing substantial growth, driven by advancements in medical science, rising healthcare needs, and the development of novel therapies. As more biopharmaceutical companies emerge and existing ones expand their product pipelines, the demand for efficient, scalable, and technologically advanced biomanufacturing processes to produce these innovative therapies is growing. Overall, the rising number of biopharmaceutical companies and the need to meet patient demands for cutting-edge therapies are driving the progress and growth of the next-generation biomanufacturing industry. As the industry continues to innovate and develop advanced manufacturing solutions, it will play a critical role in shaping the future of healthcare and contributing to improved patient outcomes.

Growing Demand for Biopharmaceuticals: The increasing demand for biopharmaceuticals is a significant driver that is boosting the demand for biomanufacturing. Biopharmaceuticals are a class of drugs produced using living organisms or biological systems, such as bacteria, yeast, mammalian cells, or plant cells. These drugs include monoclonal antibodies, vaccines, gene therapies, cell therapies, and more. The unique nature of biopharmaceuticals and their growing prominence in medical treatments have led to a higher demand for specialized biomanufacturing processes. Biopharmaceuticals have revolutionized the treatment landscape for various diseases, offering targeted therapies with high specificity and reduced side effects. As more biopharmaceuticals enter the market and offer innovative treatment options, the demand for their production increases. The development of new and advanced therapies, such as gene therapies and cell therapies, is contributing to the growing demand for biopharmaceutical manufacturing. These therapies require complex manufacturing processes that involve genetic modification and manipulation of cells, highlighting the need for specialized biomanufacturing expertise.

Key Market Challenges

Huge Capital Expenditure: The biomanufacturing process involves intricate and specialized equipment, facilities, and technologies, which can require significant financial investments. Establishing a biomanufacturing facility or upgrading existing infrastructure demands substantial initial capital investment. This encompasses constructing or renovating specialized cleanrooms, purchasing bioreactors, purification equipment, and other sophisticated tools necessary for biopharmaceutical production. The substantial capital required for biomanufacturing can divert resources away from

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other critical areas such as research and development, marketing, and business expansion. This challenge in resource allocation can impact a company's overall growth strategy. The high capital expenditure can result in either overestimating or underutilizing manufacturing capacity. If the actual demand for the manufactured product is lower than anticipated, the investment may not yield the expected returns.

Lack of Skilled Professionals: The shortage of skilled professionals is a significant challenge that can hinder the growth of the biomanufacturing market. Biomanufacturing is a highly specialized field that requires expertise in various scientific, engineering, and technical disciplines. The shortage of skilled professionals can impact the efficiency, quality, and capacity of biomanufacturing operations. The complexity of biomanufacturing processes, such as cell culture, fermentation, purification, and quality control, demands specialized expertise. A lack of skilled manpower can lead to delays in production timelines, slowing down the availability of biopharmaceuticals and other biologically derived products in the market. Skilled professionals are vital for maintaining rigorous quality control and assurance throughout the manufacturing process. The absence of skilled professionals can compromise product quality and safety. Skilled professionals also play a crucial role in driving innovation and process improvement within biomanufacturing. The lack of innovation can hinder the adoption of advanced technologies and hinder overall market growth. As the demand for biopharmaceuticals increases, companies may struggle to expand their manufacturing capacity due to the lack of skilled personnel required to manage and operate new facilities.

Key Market Trends

Emergence of Continuous Biomanufacturing: The emergence of continuous biomanufacturing has the potential to significantly boost the growth of the biomanufacturing industry in the future. Continuous biomanufacturing represents a departure from traditional batch processes by enabling seamless, uninterrupted production of biopharmaceuticals and other biologically derived products. This innovative approach offers several benefits that can positively impact efficiency, flexibility, cost-effectiveness, and overall market expansion. Continuous biomanufacturing allows for continuous monitoring and adjustment of process parameters in real-time. This leads to improved process control, reduced variability, and enhanced product consistency, resulting in higher process efficiency and reduced production times. Continuous biomanufacturing systems are generally more compact and require less physical space than traditional batch systems. This reduction in facility footprint can lead to cost savings and greater flexibility in facility design and location. Continuous biomanufacturing can enable higher production capacities by running

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processes continuously, thereby increasing output without the need for significant facility expansion. This increased capacity can meet the growing demand for biopharmaceuticals and other biologically derived products.

Development Of a Next-Generation Biomanufacturing Process: The advancement of a next-generation biomanufacturing process enables the production of biological medications for critical ailments like liver and kidney disease, cancer, and diabetes. Moreover, the growing adoption of single-use products such as single-use bioreactors and biocontainers, along with increased financial support from private investors and governments for the development of next-generation biomanufacturing units, are key drivers of the global next-generation biomanufacturing market. These trends are expected to persist throughout the forecast period.

Segmental Insights

Application Insights: Monoclonal antibodies are one of the most commonly produced products using biomanufacturing processes. Monoclonal antibodies (mAbs) are therapeutic proteins designed to target specific antigens in the body, such as cancer cells or immune system molecules. They have become integral to modern medical treatment, and their production often involves biomanufacturing techniques. Monoclonal antibodies are widely used in treating diseases including cancer, autoimmune disorders, and infectious diseases. They are produced using biomanufacturing processes that involve culturing mammalian cells to express specific antibodies. Bioreactors and advanced cell culture techniques are commonly used for mAb production. Hormones are the fastest-growing segment as hormones like insulin, growth hormone, and erythropoietin are also produced using biomanufacturing. These therapeutic proteins treat hormonal deficiencies and other medical conditions. Biomanufacturing involves using recombinant DNA technology to insert the hormone gene into host cells (e.g., bacteria or yeast), which then produce the hormone in large quantities. The manufacturing of hormones for rising cases of diabetes and other hormone deficiency-related disorders is expected to boost the demand for biomanufacturing hormones globally.

Workflow Insights: Continuous upstream biomanufacturing allows for continuous and steady production of biopharmaceuticals, eliminating the stop-start nature of traditional batch processes. This can lead to improved process efficiency, reduced downtime, and better resource utilization. The consistent environment and controlled conditions of continuous bioreactors can lead to higher cell densities and improved product yields compared to batch processes. Continuous biomanufacturing systems are often more

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compact than traditional batch systems, which can help in optimizing facility space and reducing operational costs. Continuous processes can result in more consistent and uniform product quality due to reduced variability and more precise process control.

Regional Insights: North America dominates the market due to its well-developed and advanced healthcare infrastructure, including research institutions, academic centers, and medical facilities. This infrastructure supports biomanufacturing activities and facilitates collaboration between academia, research organizations, and industry players. Regulatory agencies such as the U.S. Food and Drug Administration (FDA) have established rigorous but well-defined guidelines for the approval and oversight of biopharmaceutical products. This regulatory expertise provides confidence to both investors and consumers in the safety and quality of bio-manufactured products. North America's strong venture capital ecosystem and financial markets support the funding of biopharmaceutical startups and established companies, fueling innovation and research efforts. The Asia-Pacific region, including China and India, has been experiencing growth in the biomanufacturing sector due to factors like lower manufacturing costs, a large talent pool, and increasing demand for biopharmaceuticals in the region. Some countries actively focus on developing biomanufacturing clusters and infrastructure to attract investments and boost their biopharmaceutical capabilities.

Key Market Players

Illumina Inc.

Thermo Fischer Scientific Inc.

Oxford Nanopore Technologies plc

Agilent Technologies, Inc.

BGI

PerkinElmer Inc.

QIAGEN

Eurofins Scientific

F. Hoffmann-La Roche Ltd

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Takara Bio Inc.

Report Scope:

In this report, the Global Bio-Manufacturing Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Bio-Manufacturing Market, By Workflow:

Continuous Upstream Biomanufacturing

Single-Use Upstream Biomanufacturing

Downstream Biomanufacturing

Bio-Manufacturing Market, By Application:

Monoclonal Antibodies

Hormones

Vaccines

Recombinant Proteins

Others

Bio-Manufacturing Market, By End User:

Biopharmaceutical Companies

Research Institutions

CMOs/CDMOs

Bio-Manufacturing Market, By Region:

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North America

- United States
- Canada
- Mexico

Europe

- France
- United Kingdom
- Italy
- Germany
- Spain

Asia-Pacific

- China
- India
- Japan
- Australia
- South Korea

South America

- Brazil
- Argentina

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- Colombia
- Middle East & Africa
  - South Africa
  - Saudi Arabia
  - UAE
  - Kuwait
  - Turkey
  - Egypt

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Bio-Manufacturing Market.

Available Customizations:

Global Bio-Manufacturing market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

- Detailed analysis and profiling of additional market players (up to five).

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