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Protein Expression Market - Forecast from 2026 to 2031

https://marketpublishers.com/r/PFE7A1829B71EN.html
Date: January 2026
Pages: 149
Price: US$ 3,950.00 (Single User License)
ID: PFE7A1829B71EN

Abstracts

The protein expression market is expected to achieve a 7.61% CAGR, increasing from USD 3.768 billion in 2025 to USD 5.852 billion in 2031.

The protein expression market is experiencing robust growth driven by technological innovation, biopharmaceutical expansion, and evolving research capabilities. Protein expression—the process by which genetic information is converted into functional proteins that carry out cellular functions—has become central to modern biotechnology and drug development. Advancements in genetic engineering and proteomics, combined with the expanding biopharmaceutical industry and increasing focus on rare diseases, are propelling market momentum.

Core Market Drivers

Genetic Engineering Advancements

Progress in genetic engineering techniques, particularly CRISPR-Cas9 technology, has substantially enhanced the ability to engineer cell lines for improved protein expression. The CRISPR-Cas9 gene editing platform enables precise and efficient editing of specific DNA sequences, simplifying the addition, deletion, or modification of genes across diverse organisms. These technological capabilities represent major growth drivers for the protein expression market.

In January 2023, Kytopean launched an early access program for its gene delivery platform 'Flowfect Discover,' enabling delivery of complex genetic engineering materials with enhanced precision and efficiency. This exemplifies how emerging platforms are advancing protein expression capabilities. Additionally, advances in DNA synthesis

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technologies have made custom DNA sequence creation easier and more affordable, democratizing access to sophisticated genetic engineering tools and expanding the potential user base for protein expression technologies.

Biopharmaceutical Industry Expansion

The biotechnology industry's growth and pharmaceutical companies' increasing biologics adoption have positively contributed to protein expression market development. Rapid developments in biotechnology—including genetic engineering, recombinant DNA technology, and protein expression systems—have enabled novel biopharmaceutical production. Strategic collaborations are expanding the biopharmaceutical landscape and supporting protein expression market growth. In September 2022, CytoReason and Pfizer entered an extended five-year collaboration agreement to utilize artificial intelligence in drug discovery and development initiatives, demonstrating how partnerships are accelerating biopharmaceutical innovation and associated protein expression demands.

Rare Disease Focus

The pharmaceutical industry has emphasized orphan medication development for rare diseases, creating significant opportunities for the protein expression market. Many orphan medications are protein-based therapies requiring specialized protein molecules, directly driving demand for protein expression technologies. Approximately 30 million Americans are impacted by rare diseases, highlighting substantial unmet medical needs. The growing treatment focus is evidenced by initiatives like the NIH's Rare Diseases Clinical Research Network program, which accelerates medical research by promoting collaboration, facilitating study enrollment, and fostering data sharing among researchers.

Proteomics Advances

Progress in proteomics has fundamentally transformed understanding of proteins and their biological roles, propelling the protein expression market. Modern mass spectrometry techniques—including tandem mass spectrometry and liquid chromatography-mass spectrometry—enable sensitive, high-throughput protein analysis. Structural determination methods like X-ray crystallography, nuclear magnetic resonance spectroscopy, and cryo-electron microscopy allow researchers to determine protein structures at high resolutions, revealing critical insights into protein interactions and mechanisms.

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Furthermore, integrating proteomics with genomics and transcriptomics data enables comprehensive cellular process analyses. Multi-omics approaches provide holistic views of gene expression regulation and molecular interactions within biological systems, expanding research capabilities and creating demand for sophisticated protein expression platforms that support these integrated analytical workflows.

Market Constraints

Despite positive growth trajectories, the protein expression market faces challenges impacting expansion. Establishing and maintaining protein expression systems can be expensive, with high initial investments potentially deterring smaller research organizations or budget-constrained companies from adopting these technologies. Technical limitations also present obstacles: eukaryotic proteins requiring extensive post-translational modifications may not be adequately expressed or processed in prokaryotic systems like bacteria, necessitating more complex and time-consuming eukaryotic expression platforms.

Additionally, the protein expression market experiences intense competition, with numerous established companies competing for market share, making market entry challenging for new participants. This competitive landscape requires continuous innovation and differentiation to maintain market position.

Regional Dynamics and Recent Developments

North America is expected to hold significant market share during the forecast period, supported by strong healthcare infrastructure, increasing healthcare R&D investment, growing protein technology usage, and rising chronic disease burden. Healthcare spending in the United States remains substantially higher—both per capita and as GDP percentage—compared to other high-income nations. The expanding pharmaceutical industry further augments regional market growth, with pharmaceutical sector contributions to national economies increasing significantly.

Recent market developments underscore ongoing innovation. In July 2023, Lonza launched the TheraPRO® CHO Media System to optimize productivity and protein quality when used with GS-CHO cell lines, supporting pharmaceutical and biotechnology companies manufacturing therapeutic proteins. In May 2023, 10x Genomics introduced the Visium CytAssist Gene and Protein Expression Assay to broaden spatial analysis capabilities, enhancing the scope of gene and protein

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expression pattern studies.

The protein expression market continues evolving, driven by technological sophistication, therapeutic innovation, and expanding research applications across biotechnology and pharmaceutical sectors.

Key Benefits of this Report:

Insightful Analysis: Gain detailed market insights covering major as well as emerging geographical regions, focusing on customer segments, government policies and socio-economic factors, consumer preferences, industry verticals, and other sub-segments.

Competitive Landscape: Understand the strategic maneuvers employed by key players globally to understand possible market penetration with the correct strategy.

Market Drivers & Future Trends: Explore the dynamic factors and pivotal market trends and how they will shape future market developments.

Actionable Recommendations: Utilize the insights to exercise strategic decisions to uncover new business streams and revenues in a dynamic environment.

Caters to a Wide Audience: Beneficial and cost-effective for startups, research institutions, consultants, SMEs, and large enterprises.

What do businesses use our reports for?

Industry and Market Insights, Opportunity Assessment, Product Demand Forecasting, Market Entry Strategy, Geographical Expansion, Capital Investment Decisions, Regulatory Framework & Implications, New Product Development, Competitive Intelligence

Report Coverage:

Historical data from 2021 to 2025 & forecast data from 2026 to 2031

Growth Opportunities, Challenges, Supply Chain Outlook, Regulatory

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Framework, and Trend Analysis

Competitive Positioning, Strategies, and Market Share Analysis

Revenue Growth and Forecast Assessment of segments and regions including countries

Company Profiling (Strategies, Products, Financial Information, and Key Developments among others.

Protein Expression Market Segmentation

By Expression System

Prokaryotic

Mammalian Cell

Insect Cell

Yeast

Others

By Application

Therapeutic

Industrial

Research

By Product

Reagents

Competent Cells

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