

Cell-free Protein Expression Market Report by Product (Expression Systems, Reagents), Method (Transcription and Translation Systems, Translation Systems), Application (Enzyme Engineering, High Throughput Production, Protein Labeling, Protein-Protein Interaction, Protein Purification), End User (Pharmaceutical and Biotechnology Companies, Academic and Research Institutes, and Others), and Region 2026-2034

Market Report | 2026-04-01 | 140 pages | IMARC Group

AVAILABLE LICENSES:

- Electronic (PDF) Single User \$3999.00
- Five User Licence \$4999.00
- Enterprisewide License \$5999.00

Report description:

The global cell-free protein expression market size reached USD 301.9 Million in 2025. Looking forward, IMARC Group expects the market to reach USD 530.1 Million by 2034, exhibiting a growth rate (CAGR) of 6.26% during 2026-2034. The market is experiencing significant growth mainly driven by advancements in personalized medicine, vaccine development, and synthetic biology. The rising demand for cost-effective, flexible solutions in pharmaceuticals and biotechnology further propels market growth, positioning CFPE as a key industry enabler.

Cell-free protein expression (CFPE) refers to the production of desired recombinant proteins in solution using biomolecular translation machinery extracted from cells. It can be carried out using different cell lysates, such as E. coli, rabbit reticulocytes, wheat germ, insect cells, and mammalian cell-free protein expression systems. They are widely used in enzyme engineering, protein labeling, protein purification, protein-protein interaction, and high throughput production of mutants. CFPE is also used for analyzing components needed for protein stability, degradation, and folding. As compared to cell-based protein expression, cell-free protein expression is time efficient and convenient, allows the incorporation of non-natural amino acids, and provides enhanced stability and specificity.

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scott's-international.com

www.scott's-international.com

CELL-FREE PROTEIN EXPRESSION MARKET TRENDS:

Adoption in Synthetic Biology

Cell-Free Protein Expression (CFPE) has become a pivotal tool in synthetic biology, enabling scientists to design and engineer complex biological systems with enhanced precision. These platforms allow for the rapid prototyping of genetic circuits, facilitating swift iterations and optimizations without the limitations of living cells. CFPE also supports the testing of intricate biosynthetic pathways, accelerating the development of novel metabolic routes for producing valuable compounds. Furthermore, the ability to create and modify proteins with specific functionalities in a controlled, modular environment enhances innovation and versatility in synthetic biology projects. This combination of speed and flexibility is crucial for advancing research and developing cutting-edge biotechnological applications. Advancements in synthetic biology technologies are contributing significantly to the cell-free protein expression market growth.

Increased Use in Protein Engineering and Drug Development

The rising use of cell-free systems in protein engineering and drug development is transforming the pharmaceutical landscape. These systems enable rapid, high-throughput screening of protein variants, accelerating the identification of optimal therapeutic candidates. By eliminating the constraints of living cells, CFPE facilitates the production of challenging proteins, such as membrane-bound or toxic proteins, which are often difficult to express in traditional systems. This capability enhances the development of novel vaccines and biologics, allowing for precise modifications and optimization of protein structures. Additionally, cell-free platforms streamline the iterative design-build-test cycles, significantly reducing development time and costs. In line with this, in October 2024, Nuclera secured \$75 million to commercialize its eProtein Discovery system, streamlining protein expression and purification for drug discovery. The funding, led by Elevage Medical Technologies, aims to enhance protein production efficiency in research labs, significantly reducing timelines from months to under 48 hours. These advancements are set to increase cell-free protein expression market share, as innovative technologies and substantial investments drive the growth and adoption of CFPE systems across the pharmaceutical industry.

Expansion in Vaccine Production

The demand for rapid vaccine production, particularly highlighted during the COVID-19 pandemic, underscores the significant advantages of Cell-Free Protein Expression (CFPE) platforms. CFPE systems facilitate the swift development of vaccine candidates by enabling the efficient synthesis of recombinant proteins and mRNA-based vaccines without the constraints of living cell cultures. This accelerates the timeline from design to production, allowing for quicker responses to emerging infectious diseases. For instance, in October 2024, LenioBio announced its partnership with ReciBioPharm to enhance vaccine production using its protein expression technology. This collaboration aims to scale up protein manufacturing, aligning with CEPI's 100 Days Mission to expedite vaccine development. Additionally, CFPE offers scalability and flexibility, making it easier to adjust production volumes based on demand. As new pathogens arise and the need for diverse vaccine types grows, CFPE's ability to rapidly generate and modify vaccine components ensures a robust and adaptable manufacturing process, essential for global public health initiatives. These advancements and strategic collaborations are creating a positive cell-free protein expression market outlook across the globe.

KEY MARKET SEGMENTATION:

IMARC Group provides an analysis of the key trends in each sub-segment of the global cell-free protein expression market report, along with forecasts at the global, regional and country level from 2026-2034. Our report has categorized the market based on product, method, application and end user.

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

Breakup by Product:

- Expression Systems
 - o E. coli Cell-free Protein Expression System
 - o Wheat Germ Cell-free Protein Expression System
 - o Rabbit Reticulocytes Cell-free Protein Expression System
 - o Insect Cells Cell-free Protein Expression System
 - o Human Cell-free Protein Expression System
 - o Others
- Reagents

Breakup by Method:

- Transcription and Translation Systems
- Translation Systems

Breakup by Application:

- Enzyme Engineering
- High Throughput Production
- Protein Labeling
- Protein-Protein Interaction
- Protein Purification

Breakup by End User:

- Pharmaceutical and Biotechnology Companies
- Academic and Research Institutes

Breakup by Region:

- North America

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- United States

- Canada

- Asia-Pacific

- China

- Japan

- India

- South Korea

- Australia

- Indonesia

- Others

- Europe

- Germany

- France

- United Kingdom

- Italy

- Spain

- Russia

- Others

- Latin America

- Brazil

- Mexico

- Others

- Middle East and Africa

COMPETITIVE LANDSCAPE:

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

The report has also provided a comprehensive analysis of the competitive landscape in the global cell-free protein expression market. Detailed profiles of all major companies have also been provided. Some of the companies covered include:

- Bioneer Corporation
- biotechrabbit
- Cambridge Isotope Laboratories, Inc.
- CellFree Sciences Co., Ltd.
- Creative Biolabs
- Cube Biotech
- GeneCopoeia, Inc.
- Jena Bioscience GmbH
- New England Biolabs
- Promega Corporation
- Takara Bio Inc.
- Thermo Fisher Scientific Inc.

Kindly note that this only represents a partial list of companies, and the complete list has been provided in the report.

KEY QUESTIONS ANSWERED IN THIS REPORT

1. What was the size of the global cell-free protein expression market in 2025?
2. What is the expected growth rate of the global cell-free protein expression market during 2026-2034?
3. What are the key factors driving the global cell-free protein expression market?
4. What has been the impact of COVID-19 on the global cell-free protein expression market?
5. What is the breakup of the global cell-free protein expression market based on the product?
6. What is the breakup of the global cell-free protein expression market based on the method?
7. What is the breakup of the global cell-free protein expression market based on application?
8. What is the breakup of the global cell-free protein expression market based on the end user?

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

9. What are the key regions in the global cell-free protein expression market?

10. Who are the key players/companies in the global cell-free protein expression market?

Table of Contents:

- 1 Preface
- 2 Scope and Methodology
 - 2.1 Objectives of the Study
 - 2.2 Stakeholders
 - 2.3 Data Sources
 - 2.3.1 Primary Sources
 - 2.3.2 Secondary Sources
 - 2.4 Market Estimation
 - 2.4.1 Bottom-Up Approach
 - 2.4.2 Top-Down Approach
 - 2.5 Forecasting Methodology
- 3 Executive Summary
- 4 Introduction
 - 4.1 Overview
 - 4.2 Key Industry Trends
- 5 Global Cell-free Protein Expression Market
 - 5.1 Market Overview
 - 5.2 Market Performance
 - 5.3 Impact of COVID-19
 - 5.4 Market Forecast
- 6 Market Breakup by Product
 - 6.1 Expression Systems
 - 6.1.1 Market Trends
 - 6.1.2 Key Segments
 - 6.1.2.1 E. coli Cell-free Protein Expression System
 - 6.1.2.2 Wheat Germ Cell-free Protein Expression System
 - 6.1.2.3 Rabbit Reticulocytes Cell-free Protein Expression System
 - 6.1.2.4 Insect Cells Cell-free Protein Expression System
 - 6.1.2.5 Human Cell-free Protein Expression System
 - 6.1.2.6 Others
 - 6.1.3 Market Forecast
 - 6.2 Reagents
 - 6.2.1 Market Trends
 - 6.2.2 Market Forecast
- 7 Market Breakup by Method
 - 7.1 Transcription and Translation Systems
 - 7.1.1 Market Trends
 - 7.1.2 Market Forecast
 - 7.2 Translation Systems
 - 7.2.1 Market Trends
 - 7.2.2 Market Forecast

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 8 Market Breakup by Application
 - 8.1 Enzyme Engineering
 - 8.1.1 Market Trends
 - 8.1.2 Market Forecast
 - 8.2 High Throughput Production
 - 8.2.1 Market Trends
 - 8.2.2 Market Forecast
 - 8.3 Protein Labeling
 - 8.3.1 Market Trends
 - 8.3.2 Market Forecast
 - 8.4 Protein-Protein Interaction
 - 8.4.1 Market Trends
 - 8.4.2 Market Forecast
 - 8.5 Protein Purification
 - 8.5.1 Market Trends
 - 8.5.2 Market Forecast
- 9 Market Breakup by End User
 - 9.1 Pharmaceutical and Biotechnology Companies
 - 9.1.1 Market Trends
 - 9.1.2 Market Forecast
 - 9.2 Academic and Research Institutes
 - 9.2.1 Market Trends
 - 9.2.2 Market Forecast
 - 9.3 Others
 - 9.3.1 Market Trends
 - 9.3.2 Market Forecast
- 10 Market Breakup by Region
 - 10.1 North America
 - 10.1.1 United States
 - 10.1.1.1 Market Trends
 - 10.1.1.2 Market Forecast
 - 10.1.2 Canada
 - 10.1.2.1 Market Trends
 - 10.1.2.2 Market Forecast
 - 10.2 Asia-Pacific
 - 10.2.1 China
 - 10.2.1.1 Market Trends
 - 10.2.1.2 Market Forecast
 - 10.2.2 Japan
 - 10.2.2.1 Market Trends
 - 10.2.2.2 Market Forecast
 - 10.2.3 India
 - 10.2.3.1 Market Trends
 - 10.2.3.2 Market Forecast
 - 10.2.4 South Korea
 - 10.2.4.1 Market Trends
 - 10.2.4.2 Market Forecast

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 10.2.5 Australia
 - 10.2.5.1 Market Trends
 - 10.2.5.2 Market Forecast
- 10.2.6 Indonesia
 - 10.2.6.1 Market Trends
 - 10.2.6.2 Market Forecast
- 10.2.7 Others
 - 10.2.7.1 Market Trends
 - 10.2.7.2 Market Forecast
- 10.3 Europe
 - 10.3.1 Germany
 - 10.3.1.1 Market Trends
 - 10.3.1.2 Market Forecast
 - 10.3.2 France
 - 10.3.2.1 Market Trends
 - 10.3.2.2 Market Forecast
 - 10.3.3 United Kingdom
 - 10.3.3.1 Market Trends
 - 10.3.3.2 Market Forecast
 - 10.3.4 Italy
 - 10.3.4.1 Market Trends
 - 10.3.4.2 Market Forecast
 - 10.3.5 Spain
 - 10.3.5.1 Market Trends
 - 10.3.5.2 Market Forecast
 - 10.3.6 Russia
 - 10.3.6.1 Market Trends
 - 10.3.6.2 Market Forecast
 - 10.3.7 Others
 - 10.3.7.1 Market Trends
 - 10.3.7.2 Market Forecast
- 10.4 Latin America
 - 10.4.1 Brazil
 - 10.4.1.1 Market Trends
 - 10.4.1.2 Market Forecast
 - 10.4.2 Mexico
 - 10.4.2.1 Market Trends
 - 10.4.2.2 Market Forecast
 - 10.4.3 Others
 - 10.4.3.1 Market Trends
 - 10.4.3.2 Market Forecast
- 10.5 Middle East and Africa
 - 10.5.1 Market Trends
 - 10.5.2 Market Breakup by Country
 - 10.5.3 Market Forecast
- 11 SWOT Analysis
 - 11.1 Overview

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 11.2 Strengths
- 11.3 Weaknesses
- 11.4 Opportunities
- 11.5 Threats
- 12 Value Chain Analysis
- 13 Porters Five Forces Analysis
 - 13.1 Overview
 - 13.2 Bargaining Power of Buyers
 - 13.3 Bargaining Power of Suppliers
 - 13.4 Degree of Competition
 - 13.5 Threat of New Entrants
 - 13.6 Threat of Substitutes
- 14 Price Analysis
- 15 Competitive Landscape
 - 15.1 Market Structure
 - 15.2 Key Players
 - 15.3 Profiles of Key Players
 - 15.3.1 Bioneer Corporation
 - 15.3.1.1 Company Overview
 - 15.3.1.2 Product Portfolio
 - 15.3.1.3 Financials
 - 15.3.2 biotechrabbit
 - 15.3.2.1 Company Overview
 - 15.3.2.2 Product Portfolio
 - 15.3.3 Cambridge Isotope Laboratories, Inc.
 - 15.3.3.1 Company Overview
 - 15.3.3.2 Product Portfolio
 - 15.3.4 CellFree Sciences Co., Ltd.
 - 15.3.4.1 Company Overview
 - 15.3.4.2 Product Portfolio
 - 15.3.5 Creative Biolabs
 - 15.3.5.1 Company Overview
 - 15.3.5.2 Product Portfolio
 - 15.3.5.3 Financials
 - 15.3.5.4 SWOT Analysis
 - 15.3.6 Cube Biotech
 - 15.3.6.1 Company Overview
 - 15.3.6.2 Product Portfolio
 - 15.3.7 GeneCopoeia, Inc.
 - 15.3.7.1 Company Overview
 - 15.3.7.2 Product Portfolio
 - 15.3.8 Jena Bioscience GmbH
 - 15.3.8.1 Company Overview
 - 15.3.8.2 Product Portfolio
 - 15.3.9 New England Biolabs
 - 15.3.9.1 Company Overview
 - 15.3.9.2 Product Portfolio

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 15.3.10 Promega Corporation
 - 15.3.10.1 Company Overview
 - 15.3.10.2 Product Portfolio
- 15.3.11 Takara Bio Inc.
 - 15.3.11.1 Company Overview
 - 15.3.11.2 Product Portfolio
 - 15.3.11.3 Financials
- 15.3.12 Thermo Fisher Scientific Inc.
 - 15.3.12.1 Company Overview
 - 15.3.12.2 Product Portfolio
 - 15.3.12.3 Financials
 - 15.3.12.4 SWOT Analysis

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

Cell-free Protein Expression Market Report by Product (Expression Systems, Reagents), Method (Transcription and Translation Systems, Translation Systems), Application (Enzyme Engineering, High Throughput Production, Protein Labeling, Protein-Protein Interaction, Protein Purification), End User (Pharmaceutical and Biotechnology Companies, Academic and Research Institutes, and Others), and Region 2026-2034

Market Report | 2026-04-01 | 140 pages | IMARC Group

To place an Order with Scotts International:

- Print this form
- Complete the relevant blank fields and sign
- Send as a scanned email to support@scotts-international.com

ORDER FORM:

Select license	License	Price
	Electronic (PDF) Single User	\$3999.00
	Five User Licence	\$4999.00
	Enterprisewide License	\$5999.00
		VAT
		Total

*Please circle the relevant license option. For any questions please contact support@scotts-international.com or 0048 603 394 346.

** VAT will be added at 23% for Polish based companies, individuals and EU based companies who are unable to provide a valid EU Vat Numbers.

Email*	<input type="text"/>	Phone*	<input type="text"/>
First Name*	<input type="text"/>	Last Name*	<input type="text"/>
Job title*	<input type="text"/>		

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

Company Name*	<input type="text"/>	EU Vat / Tax ID / NIP number*	<input type="text"/>
Address*	<input type="text"/>	City*	<input type="text"/>
Zip Code*	<input type="text"/>	Country*	<input type="text"/>
		Date	<input type="text" value="2026-06-08"/>
		Signature	<input type="text"/>