

Viral Vector Production - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Vector Type (Adenovirus, AAV, Lentivirus, Retrovirus, others), By Workflow (Upstream Processing, Vector amplification and expansion, Vector recovery/harvesting, Downstream Processing, Purification, Fill finish), By Application (Gene and Cell Therapy Development, Vaccine Development, Biopharmaceutical and Pharmaceutical Discovery, Biomedical Research), By End User (Pharmaceutical and Biopharmaceutical Companies, Research Institutes), By Region, Competition

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Abstracts

The Global Viral Vector Production Market recorded a valuation of USD 5.22 Billion in 2022 and is expected to exhibit substantial growth during the forecast period, projecting a Compound Annual Growth Rate (CAGR) of 14.21% and expected to reach USD 11.54 Billion through 2028. Viral vector production entails the creation and manufacturing of modified viruses, referred to as viral vectors, which are employed to deliver genetic material into target cells for diverse medical and biotechnological applications. These viral vectors are pivotal tools in advanced therapeutic approaches like gene therapy and gene editing. They are designed to be efficient and safe carriers for delivering therapeutic genes, rectifying genetic mutations, or manipulating cellular processes. Various types of viruses are utilized as vectors, including adeno-associated viruses (AAV), lentiviruses, and adenoviruses, based on factors such as target cells, the

therapeutic gene, and desired gene expression duration. Genetic modification of viral vectors eliminates or replaces disease-causing elements while incorporating the therapeutic gene of interest.

The escalating triumph and approval of gene therapies for different diseases, such as genetic disorders and certain cancers, have boosted the demand for viral vectors as essential delivery tools for therapeutic genes. The rising prevalence of genetic disorders and diseases with a genetic component has spurred the requirement for targeted and effective treatments. Viral vectors offer a means to transport corrective or therapeutic genes into affected cells, making them a pivotal component in addressing such conditions. Research organizations, academic institutions, pharmaceutical firms, and biotechnology companies are channeling substantial investments into gene therapy research and development. This increased focus on the field is directly propelling the demand for viral vectors and their production.

Key Market Drivers

1. Pioneering Clinical Success of Viral Vector Production:

The successful clinical applications of viral vector production, where viral vectors have been effectively used in medical treatments and therapies, have demonstrated the potential of viral vector-based approaches to address a spectrum of diseases. For instance, Luxturna, developed by Spark Therapeutics, employs adeno-associated virus (AAV) vectors to treat inherited retinal disease. Zolgensma, developed by AveXis, uses AAV9 vectors to treat spinal muscular atrophy. These clinical successes underscore the transformative capability of viral vector-based therapies in treating various genetic and acquired diseases.

2. Advancements in Vector Engineering:

Advances in vector engineering have significantly improved the efficiency, safety, and specificity of viral vectors used in gene therapy, gene editing, and vaccine development. Modifications to viral vectors enhance their tissue targeting, reduce immunogenicity, and improve cellular entry for efficient gene delivery. Furthermore, integration of genome editing technologies like CRISPR-Cas9 into viral vector platforms allows for precise genetic modifications. Synthetic vectors designed from scratch are also being explored for tailored applications.

3. Growing Bioreactor Technology in Viral Vector Production:

Bioreactor technology plays a crucial role in producing viral vectors for gene therapy and gene editing. Bioreactors provide controlled environments for cell culture, transfection, and vector production, ensuring consistent quality and yield. Single-use bioreactors have gained traction due to their ease of use and reduced contamination risk. These systems enhance scalability, yield, and quality while reducing resource consumption and waste.

Key Market Challenges

1. Scalability and Commercialization:

Transitioning from small-scale laboratory production to large-scale manufacturing for commercialization poses challenges in viral vector production. Scaling up production steps while maintaining product quality requires optimization of cell culture, transfection, purification, and quality control processes. Designing manufacturing facilities that adhere to regulatory standards is capital-intensive, and challenges associated with maintaining high productivity and product integrity can lead to extended timelines for commercialization.

2. Cost of Goods and Pricing:

The specialized nature of viral vector production, along with quality control measures and regulatory compliance, contributes to higher production costs. Culture media, growth factors, and other raw materials used in production can be expensive. Skilled professionals are required for specialized tasks, increasing labor costs. These factors collectively impact the affordability and accessibility of viral vector-based therapies.

Key Market Trends

1. Manufacturing Process Optimization:

The field emphasizes refining and improving viral vector production processes to enhance efficiency, reduce costs, increase yields, and ensure consistent quality. Optimization includes enhancing downstream and upstream processing steps, increasing yield, and maintaining product quality. Standardizing processes across facilities ensures uniformity, regulatory compliance, and quality.

2. Segmental Insights:

The market dominance of the AAV segment is driven by the increasing demand for AAV vectors in gene therapy. Downstream processing dominates the workflow segment due to its crucial role in maintaining vector quality and yield. The gene therapy application segment thrives due to the potential of durable solutions for genetic diseases. Research institutes are the dominant end users, showcasing the commitment to cutting-edge therapies.

3. Regional Insights:

North America leads the market due to robust government support, financing, and a thriving research and development environment for gene therapy and advanced therapeutics.

Key Market Players

Merck kgaa

Lonza

FUJIFILM Diosynth Biotechnologies U.S.A

Cobra Biologics Ltd.

ThermoFisher Scientific Inc.

Waisman Biomanufacturing

Genezen Laboratories

YPOSKESI

Advanced BioScience Laboratories, Inc. (ABL inc.)

Novasep Holding s.a.s.

Orgenesis Biotech Israel Ltd (formerly ATVIO Biotech Ltd.)

Takara Bio Inc.

RegenxBio, Inc.

Aldevron LLc.

Bluebird Bio Inc.

Report Scope:

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

Viral Vector Production Market, By Vector Type:

Adenovirus

AAV

Lentivirus

Retrovirus

Others

Viral Vector Production Market, By Workflow:

Upstream Processing

Vector amplification and expansion

Vector recovery/harvesting

Downstream Processing

Purification

Fill finish

Viral Vector Production Market, By Application:

Gene and Cell Therapy Development

Vaccine Development

Biopharmaceutical and Pharmaceutical Discovery

Biomedical Research

Viral Vector Production Market, By End User:

Pharmaceutical and Biopharmaceutical Companies

Research Institutes

Global Viral Vector Production Market, By region:

North America

United States

Canada

Mexico

Asia-Pacific

China

India

South Korea

Australia

Japan

Europe

Germany

France

United Kingdom

Spain

Italy

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Viral Vector Production Market.

Available Customizations:

Global Dyes 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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