

Transfection Reagents & Equipment Market to Hit USD 2.54 Bn by 2032 | SNS Insider

Rising demand for gene therapy and biopharmaceutical research fuels an 8.12% CAGR in the transfection market, poised for significant growth through 2032.

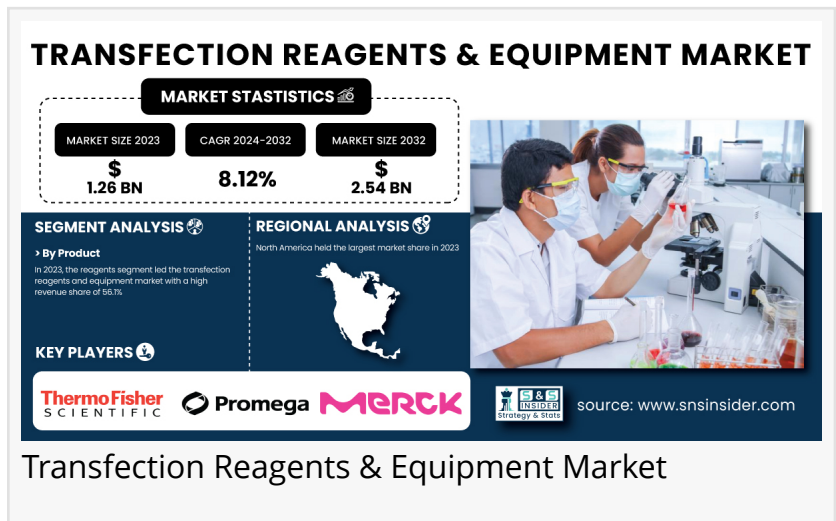
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According to a report by SNS Insider, the [Transfection Reagents & Equipment Market](#) was valued at USD 1.26 billion in 2023 and is projected to reach USD 2.54 billion by 2032, growing at a CAGR of 8.12% during the forecast period 2024-2032. The increasing adoption of transfection technologies in gene therapy, vaccine development, and cancer research is expected to drive market expansion.

Market analysis

Recent advancements in personalized medicine and gene therapy are anticipated to be the major driving factors for transfection reagents and equipment market. The increase in chronic diseases and genetic disorders, researchers are directing their efforts to the gene editing technologies like CRISPR-Cas9 which heavily depends on efficient transfection techniques. Moreover, factors such as the growth of the biopharmaceutical industry and the increasing need for large-scale production of recombinant proteins and monoclonal antibodies are driving the demand for transfection technologies.

Moreover, there is also a growing trend toward the use of non-viral transfection methods, including electroporation and lipofection, owing to their safety and efficiency over viral vectors. The market is propelled by the development of novel transfection reagents and instruments that are higher transfection efficiency with lower cytotoxicity. In addition, the increasing adoption of automation and high-throughput systems in transfection is improving productivity while lowering the operational cost, enabling the use of these technologies by researcher and pharma at a lower cost.



Market Segmentation Insights

By Product

The reagents segment accounted for 56.1% of revenue share in transfection reagents and equipment market in 2023. Reagents (lipid-based, polymer-based and calcium phosphate reagents) have been widely used because they are simple, inexpensive, and compatible with multiple cell types. The increasing demand for cell line and application-specific transfection reagents is another factor that is projected to drive the growth of this segment. The live-cell imaging equipment, such as electroporation systems or microinjection devices, is essential for big-scale research efforts and industrial.

By Method

In 2023, the electroporation technique dominated the market due to its high efficiency in transfecting various cell types, even those which are notoriously hard-to-transfect. Electroporation uses electrical pulses to create temporary pores in cell membranes, allowing nucleic acids to enter cells. This is a widely-used approach in gene therapy and vaccine development. Other methods, such as lipofection and viral transduction, are also widely used, with lipofection being favored for its simplicity and viral transduction for its high efficiency in gene delivery.

By Application

The gene expression studies segment held the largest revenue share in 2023 due to the growing adoption of transfection in functional genomics and proteomics studies. Transfection is the foundation for gene function, protein expression and regulatory mechanisms studies in cells. Market growth is also fuelled by other applications such as protein production, therapeutic delivery, and biomedical research. Increasing demand for recombinant proteins and monoclonal antibodies in therapeutics applications also drives the transfection technologies market.

By End-Use

The pharmaceutical and biotechnology industry became the leading segment in 2023 and this is attributed to the increasing need for gene curing as well as biopharmaceutical development. Transfection technologies are key enablers for gene-based therapies, vaccines, and biologics. Basic research and drug discovery are other areas of important application for transfection, making academic and research institutions major end-users. Moreover, transfection technologies are gaining popularity among contract research organizations (CROs) to assist pharmaceutical and biotechnology companies with their R&D processes.

Key Players in the Market:

- Thermo Fisher Scientific Inc.: Lipofectamine Transfection Reagents, Neon Transfection System, Invitrogen FreeStyle 293-F Cells, Gibco ExpiFectamine 293 Transfection Kit.
- Promega Corporation: TransFast Transfection Reagent, Transfectol Transfection Reagent.

- Lonza: Nucleofector Transfection Systems, 4D-Nucleofector System.
- QIAGEN: Effectene Transfection Reagent, Attractene Transfection Reagent.
- F. Hoffmann-La Roche Ltd.: X-tremeGENE Transfection Reagents.
- Bio-Rad Laboratories, Inc.: Gene Pulser Electroporation Systems, Trans-Blot Turbo Transfer System.
- Merck KGaA: FuGENE Transfection Reagents, X-tremeGENE Transfection Reagents.
- OriGene Technologies, Inc.: TurboFectin Transfection Reagent.
- MaxCyte: MaxCyte STX Scalable Transfection System.
- Polyplus-transfection SA: jetPEI Transfection Reagent, FectoVIR-AAV Transfection Reagent.
- Aldevron: Transfection-grade Plasmid DNA.
- Cell Biolabs: Transfection Reagents, ViraDuctin Lentivirus Transduction Kit.
- Agilent Technologies: SureFECT Transfection Reagent.
- Mirus Bio: TransIT Transfection Reagents, TransIT-X2 Dynamic Delivery System.
- Vector Laboratories: GenePORTER Transfection Reagents.
- Dharmacon (Horizon Discovery Group): DharmaFECT Transfection Reagents.

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Regional Insights

In 2023, North America dominated the market with the highest market share, attributable to the region's highly developed healthcare infrastructure, the large number of pharmaceutical and biotechnology firms, and substantial investments in genetic research. The United States is a major innovator, thanks to government programs like National Institutes of Health (NIH) funding for gene therapy research and increasing prevalence of personalized medicine. Further driving the growth of the market is the region's focus on innovative and advanced technological advancements in molecular biology. During the forecast period, the Asia-Pacific region is expected to register the highest growth rate owing to the increasing investment in biotechnology research, growing healthcare expenditure, and initiatives taken by the government to boost genetic research. China, India, and Japan lead this growth, experiencing increased biopharmaceutical industry activity and awareness of gene therapy.

Recent Developments

- In 2023, Thermo Fisher Scientific launched a new line of transfection reagents designed for high-efficiency gene delivery in hard-to-transfect cells, catering to the growing demand for advanced gene editing tools.
- In 2023, Lonza expanded its transfection equipment portfolio with the introduction of automated electroporation systems, aimed at enhancing productivity and scalability in biopharmaceutical production.

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