

Oligonucleotide Synthesis Market Assessment, By Product [Oligonucleotides, Equipment, Reagents], By Type [Customized Oligos, Predesigned Oligos], By Application [Therapeutics, Diagnostics, Research], By End-user [Pharmaceutical and Biotechnology Company, Diagnostic Laboratories, Academic Research Institutes, Hospitals], By Region, Opportunities and Forecast, 2017-2031F

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Report description:

Global oligonucleotide synthesis market is projected to witness a CAGR of 15.17% during the forecast period 2024-2031F, growing from USD 6.06 billion in 2023 to USD 18.76 billion in 2031F. The market's growth is supported by the increasing investments towards research and development activities in the pharmaceutical and biotechnology sectors, rising collaborations and partnerships among various companies, growing prevalence of chronic diseases, and rising demand for custom oligonucleotides for use in forensics, genetic testing, and research activities.

Rising research and development investments are a major global trend in the oligonucleotide synthesis market. In September 2023, Insud Pharma Group, one of the leading Spanish pharmaceutical companies, inaugurated its oligonucleotide center at Chemo India Formulation Private Limited. The research and production center will focus on commercial production and research on oligonucleotides. The facility was inspected and approved by the Drug Control Center of India, Spanish Health Agency, and the US FDA (United States Food and Drug Association).

Introducing novel products and technologies provides lucrative growth opportunities to the market. In April 2024, Asahi Kasei Bioprocess Inc. unveiled their latest oligo manufacturing innovation, the THESYS ACS ERGO synthesis column, which offers reduced changeover time while maintaining the quality of the product and maintaining user safety. The THESYS ACS ERGO facilitates a safe and smooth changeover between runs with the help of its operator-friendly design and is engineered to reduce inefficiencies between batches. The time-saving feature of the THESYS ACS ERGO is achieved by eliminating the utilization of threaded bolts in the maintenance and changeover process.

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Mergers and Acquisitions are Supporting Market Expansion

The growth of the market is supported by the rising mergers and acquisitions and successful collaborations in various regions across the globe. These activities allow companies to follow through with successful research collaborations and ensure the discovery, delivery, and development of advanced technologies. Mergers and acquisitions aid in the company's organic expansion and provide necessary funds for driving research and development activities and development of novel therapies and technologies, thus bolstering the global oligonucleotide synthesis market growth.

In June 2024, GSK plc announced the acquisition of Elsie Biotechnologies, LLC for USD 50 million to capitalize on the potential of oligonucleotide therapeutics. The unique ability of the oligonucleotides to modulate gene expressions makes them a potential modality for addressing a wide range of therapeutic targets that might not be amenable to small biologics and molecules. Elsie is focused on optimizing delivery, reducing toxicity, and enhancing the potency of oligonucleotide therapeutics. With the acquisition of Elsie, GSK is expected to enhance its research and development efforts in gene modulation. Furthermore, the utilization of machine learning and artificial intelligence by GSK, in combination with the data from Elsie's platform, is expected to support the development of predictive models for streamlining future oligonucleotide designs.

Rising Applications in Diagnostics Bolsters the Market Growth

The rising demand for oligonucleotides due to the growing prevalence of various diseases and disorders is bolstering the global demand for oligonucleotide synthesis. For research and diagnostic applications, oligonucleotides are synthesized using controlled pore glass (CPG). In molecular biology, oligonucleotides aid in detecting the desired RNA and DNA sequences using hybridization assays and polymerase chain reactions. The oligonucleotide-based microarrays have been developed to analyze the gene expression levels in various cell types and tissues, and oligonucleotide probes can be used to identify polymorphisms and specific mutations associated with genetic disorders. The rise in the number of cases of genetic disorders is thus bolstering the demand for oligonucleotides for diagnostic interventions. According to the estimates of the epilepsy foundation, 1 in 20,000 to 1 in 40,000 individuals have Dravet Syndrome.

Therapeutics Segment to Account for Significant Global Oligonucleotide Synthesis Market Share

The growth of the segment is aided by the rising prevalence of chronic diseases and increasing utilization of oligonucleotides in drug development processes. Over the past few years' oligonucleotides have demonstrated the ability to provide patients with major therapeutic benefits, future developments are expected to boost the expansion of the segment. The segment's growth is supported by the rise in the number of collaborations to support the discovery and development of oligonucleotide therapeutics. In May 2024, Orbit Discovery Ltd. and Secarna Pharmaceuticals GmbH & Co. entered in a collaboration for developing peptide-conjugated targeted antisense oligonucleotide (ASO) therapeutics. The collaboration aims to expand Secarna's reach of antisense approaches and strengthen their ability of creating targeted antisense therapeutics, allowing them to offer novel treatment solutions for a wide range of diseases.

Additionally, the growth of the market is supported by the rising investments in companies that are focused on the development of targeted oligonucleotide therapeutics. In January 2022, Ceptur Therapeutics, Inc. announced the completion of a USD 75 million Series A financing. The biotechnology company focuses on the development of targeted oligonucleotide therapeutics that are based on U1 Adaptor Technology. Such investments are expected to support the development of novel products, propelling the expansion of the segment.

North America Accounts for Significant Market Share

The factors supporting the market's growth in North America include rising investments towards the development of advanced therapeutic solutions, rapid expansion of the healthcare and pharmaceutical sectors, and increasing prevalence of various chronic diseases. According to the estimates of the National Cancer Institute, approximately 2,001,140 cases of cancer and 611,720 deaths from the disease are expected to occur in the United States in 2024.

The growing emphasis on novel product development coupled with rising approvals from the US FDA further supports the market expansion. In June 2024, the FDA approved Geron Corporation's RYTELO (imetelstat), an oligonucleotide telomerase inhibitor for treating adults with low-to-intermediate-1 risk myelodysplastic syndromes (LR-MDS) that have transfusion-dependent anemia and require four or more units of red blood cells over eight weeks. Approval was given based on the safety and efficacy findings from the placebo-controlled, randomized, phase 3 IMerge trial.

Furthermore, rising investments in the development of oligonucleotide manufacturing facilities are supporting the expansion of

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the market in North America. In November 2023, Integrated DNA Technologies, Inc. opened its new therapeutic oligonucleotide manufacturing facility in Iowa, the United States. The site manufactures gene therapy reagents and cGMP cells, including donor oligos for homology-directed repair and sgRNAs (single guide RNAs).

Future Market Scenario (2024 - 2031F)

The potential applications for oligonucleotide synthesis are expected to expand over the forecast period, from gene regulation to gene editing and personalized medicine, novel applications of oligonucleotide synthesis are anticipated to emerge. Future applications and innovations are expected to increasingly focus on personalized medicines and the designing of oligonucleotides that are capable of targeting specific genomic regions or mutations, strengthening the possibility of developing therapies tailored to specific patient requirements, thus facilitating the growth of the market in the forecast period.

Furthermore, the rise in the number of research activities that use oligonucleotides as interventions or treatments is expected to support the expansion of the market in the coming years. The University College London (UCL) is conducting an interventional study, which is expected to conclude in August 2025, to assess if the drug NIO752 reduces the production of tau protein by the brain. In normal conditions tau is responsible for stabilizing neuronal microtubules, however in Alzheimer's the protein builds up in the brain and causes damage.

Key Players Landscape and Outlook

The rising investments by companies across the globe towards developing oligonucleotide manufacturing facilities is expected to boost the global oligonucleotide synthesis market size. Companies are increasingly focusing on forming strategic partnerships and alliances to support such development activities. In April 2024, Axolabs GmbH and Asahi Kasei Bioprocess Inc. (AKB), part of the Asahi Kasei Group, announced a partnership to build a cGMP manufacturing facility in Berlin to accelerate the commercialization and development of oligonucleotide-based therapies.

Such investments are increasing as oligonucleotide therapies offer targeted approaches for protein production and gene expression modulation and can potentially treat a broad range of diseases. At present, the FDA has approved eighteen oligonucleotide drugs.

Additionally, the market's growth is supported by the rising investments by the key market players in oligonucleotide manufacturing suites. In March 2024, Merck announced the opening of its first cGMP Oligonucleotide Manufacturing suite in Missouri, the United States. The development is expected to enhance the company's oligo offerings to include cGMP quality oligos tailored for clinical and diagnostic markets.

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