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Next-Generation Sequencing Market Assessment, By Product [NGS Consumables, Presequencing Products and Services, Sequencing Services, NGS Platforms, Bioinformatics, Services for NGS Platforms], By Sequencing Type [RNA Sequencing, Whole Genome Sequencing, Whole Exome Sequencing, Targeted Resequencing, CHIP Sequencing, De Novo Sequencing, Methyl Sequencing, Others], By Technology [Sequencing by Synthesis, Single-Molecule Real-Time Sequencing, Nanopore Sequencing, Ion Semiconductor Sequencing, Others], By Application [Drug Discovery and Personalized Medicine, Diagnostics, Genetic Screening, Agriculture and Animal Research, Others], By End-user [Hospitals and Clinics, Academic Institutes and Research Centers, Pharmaceutical and Biotechnology Companies, Others], By Region, Opportunities and Forecast, 2017-2031F

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Abstracts

Global next-generation sequencing market is projected to witness a CAGR of 17.52% during the forecast period 2024-2031, growing from USD 10.59 billion in 2023 to USD

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38.52 billion in 2031. Various elements have propelled the growth and expansion of the global next-generation sequencing market. Key factors encompass the reduction in costs, increased applications in clinical diagnostics, advancements in technology, expanding research activities, collaborative partnerships, broader uses in agriculture and animal genomics, rising demand for personalized medicine, supportive government initiatives and funding, and the escalating awareness and acceptance of NGS technologies.

In line with this, the continual decrease in sequencing expenses has notably broadened accessibility, allowing researchers and clinicians to utilize NGS across various disciplines. Simultaneously, the upsurge in NGS applications in clinical diagnostics has been transformative, harnessing its capabilities for disease identification, treatment planning, and the realm of personalized medicine, consequently enhancing its importance in healthcare. The cornerstone of advancements in sequencing technologies has consistently improved precision, speed, and cost-effectiveness, thereby increasing NGS's appeal across diverse industries and propelling the growth of global next-generation sequencing market. This momentum has been further driven by the proliferation of academic, pharmaceutical, and biotechnological research undertakings, enabling a more profound exploration of genomics and its practical applications.

Synergistic collaborations and partnerships within the global next-generation sequencing market have spurred innovation, propelling product enhancements and broadening the spectrum of NGS applications. Furthermore, the integration of NGS in agricultural and animal genomics has revolutionized practices related to crop enhancement, breeding programs, and disease analysis, extending its utility beyond human healthcare. The escalating demand for personalized medicine has emerged as a pivotal driver, harnessing NGS's capability to decipher individual genetic variations for tailor-made treatments. Supportive government initiatives and funding have incentivized research, advancement, and the widespread adoption of NGS technologies. Ultimately, the growing awareness and acceptance of NGS within the scientific community and among the general population have bolstered its significance, solidifying its pivotal role as an indispensable instrument for innovation and progress across the global next-generation sequencing market.

Increased Applications in Clinical Diagnostics

The significant increase in clinical diagnostics applications serves as a fundamental driver advancing the global next-generation sequencing market. This surge originates

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from NGS's transformative capabilities in identifying diseases, predicting their progression, and tailoring treatment plans. Through comprehensive genomic profiling, NGS aids in detecting disease-related genetic variations, improving diagnostic accuracy and refining treatment decisions. Its versatility spans across oncology, inherited conditions, infectious diseases, and pharmacogenomics, offering in-depth insights into individual genetic profiles. Furthermore, the ongoing enhancement of NGS technologies has diminished expenses and enhanced effectiveness, rendering it more feasible for regular clinical utilization. Consequently, the incorporation of NGS into clinical routines is expanding, catalysing a shift towards precision medicine. This amplified adoption in clinical environments not only elevates patient care standards but also propels the upward trajectory of the global NGS market, emphasizing its substantial impact on contemporary healthcare practices.

Technological Advancements

Technological advancements, notably Artificial Intelligence (AI), are potent catalysts propelling the global next-generation sequencing market forward. AI integration augments NGS by streamlining data analysis, enhancing accuracy, and expediting insights from complex genomic information. Machine learning algorithms assist in interpreting vast sequencing datasets, facilitating the identification of genetic patterns linked to diseases or therapeutic responses. This convergence of AI with NGS amplifies efficiency, reduces costs, and enables innovative applications, extending the technology's appeal across research, clinical diagnostics, and personalized medicine. Such advancements are pivotal in shaping the landscape of genomics and its widespread utilization, underscoring AI's crucial role in advancing the NGS domain.

For instance, in July 2023, South Korea's NGeneBio Co., a medical diagnostics firm, revealed the creation of 'NGeneBioAI,' an AI-driven precision diagnostic company in the United States. Fully financed by its parent company, NGeneBio, this venture is poised to significantly impact the US cancer diagnostics market. Leveraging its next-generation sequencing (NGS) precision diagnostic platform, NGeneBioAI aims to establish a pivotal presence in the realm of cancer diagnostics within the United States.

Government Initiatives

Governments across the globe are employing varied approaches, notably promoting collaborations between the public and private sectors, to strengthen the global next-generation sequencing market. These strategies aim to merge governmental resources with the expertise of private entities, fostering cooperation in technological

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advancements, genomics research, and innovative practices. Through these partnerships, governments facilitate knowledge exchange, funding accessibility and the establishment of supportive structures, hastening the uptake and advancement of NGS technologies. These coordinated endeavors leverage the strengths of both sectors, driving the expansion of the NGS market and securing its pivotal role in propelling worldwide scientific advancements and progress in healthcare.

For instance, in October 2023, The Department of Health and Human Services disclosed awards exceeding USD 500 million to aid companies advancing their vaccine candidates into Phase 2b clinical trials and innovating new technologies within Project NextGen. This initiative, a USD 5 billion government endeavour, aims to accelerate the development of next-gen vaccines and treatments via collaborations between public and private entities. The funding supports efforts to expedite vaccine development and the exploration of cutting-edge technologies, reflecting Project NextGen's commitment to catalysing advancements in the medical field through strategic partnerships.

Growing Demand for RNA Sequencing Tools

The surging desire for RNA sequencing tools is crucial in propelling the global next-generation sequencing market. This increased requirement stems from the pivotal function of RNA sequencing in interpreting gene expression, investigating transcriptomic patterns, and comprehending RNA-based mechanisms within health and disease contexts. RNA sequencing empowers the examination of various RNA molecules, enabling the elucidation of complex biological processes, discovery of biomarkers, and identification of therapeutic targets. As the scientific community increasingly acknowledges RNA's importance, the rising demand for RNA sequencing tools drives innovation in NGS technologies, significantly contributing to market expansion and advancing biological research and clinical applications.

As an example, in May 2023, Twist Bioscience Corporation—a business that empowers clients to thrive by providing premium synthetic DNA via its silicon platform—announced the introduction of a range of RNA sequencing instruments, comprising the Twist RNA Exome, Twist RNA Library Prep Kit, and the Twist Ribosomal RNA (rRNA) & Haemoglobin (Globin) Depletion Kit, in addition to customized target enrichment capabilities for RNA and whole transcriptome sequencing.

Growing Popularity of Next-Generation Sequencing Service

The increasing need for advanced sequencing services drives the global next-

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generation sequencing market. NGS transforms genomics, facilitating swift, cost-efficient DNA sequencing. Its wide-ranging applications in healthcare, agriculture, and research propel market growth. Heightened occurrences of genetic disorders, personalized medicine trends, and bioinformatics advancements boost NGS demand. Moreover, reduced sequencing expenses enhance its accessibility. Industries and research bodies increasingly embrace NGS due to its high-throughput capabilities and precise data, fostering market expansion. This surge in demand sustains the continual upward trajectory of the global next generation sequencing market, meeting the diverse needs across various fields seeking comprehensive genomic insights.

For instance, in August 2023, Quantum-Si, a company specializing in protein sequencing, introduced a groundbreaking Next-Generation Protein Sequencing Platform. This innovative Platinum platform, the first of its kind, offers a straightforward, user-friendly benchtop solution that seamlessly fits into current workflows. It aims to enable laboratories worldwide to perform benchtop proteomics experiments easily and effectively.

Future Market Scenario (2024-2031F)

The future of the global next-generation sequencing market holds immense promise, driven by technological progress like enhanced automation, precision, and cost reduction. NGS's adaptability spans diverse domains like healthcare, agriculture, and scientific research, amplifying its importance. Rising genetic-based treatments and diagnostics, alongside a surging demand for personalized medicine, heighten NGS's relevance in healthcare. Moreover, its application in agricultural genomics signals potential for improved crop productivity and sustainability.

Ongoing innovations in bioinformatics and data analysis refine NGS capabilities, uncovering deeper genetic insights. Advancements toward point-of-care sequencing and potential integration with AI foreshadow a future of more accessible and efficient genomic analysis. Despite challenges like data management and ethical concerns, persistent research, partnerships, and regulatory backing maintain an optimistic market trajectory. Consequently, the global NGS market appears poised for sustained growth and transformative advancements, reflecting a bright and promising future.

Key Players Landscape and Outlook

Major entities in the global next-generation sequencing market actively seek partnerships to stimulate innovation and industry expansion. These alliances facilitate

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the exchange of resources, merging expertise and capitalizing on complementary strengths to pioneer advanced technologies and remedies. Collaborations among leading NGS firms bolster research capacities, hasten product advancement, and enhance market reach. Through combined resources, risk-sharing, and diverse viewpoints, these partnerships target intricate issues, elevate product portfolios, and establish stronger footholds in the competitive global next-generation sequencing market. Ultimately, they cultivate a more resilient and vibrant market environment, contributing to a dynamic industry ecosystem.

To help increase local access to NGS-based testing for patients with lung and breast cancer in more than 30 countries across Latin America, Africa, the Middle East, and Asia, where advanced genomic testing has previously been limited or unavailable, Pfizer and Thermo Fisher Scientific Inc. announced in May 2023 that they had entered into a collaboration agreement.

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