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Synthetic Biology - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Synthetic Biology Market size is estimated at USD 79.39 billion in 2024, and is expected to reach USD 145.49 billion by 2029, growing at a CAGR of 12.88% during the forecast period (2024-2029).

The market is expected to grow with the increasing support from the government and private institutions, increasing R&D investments in drug discovery, and the development and declining cost of DNA sequencing and synthesizing. The growing involvement of government bodies, research institutes, and large organizations in synthetic biology research activities will likely support the market in the next few years. Governments of various nations have been providing research support for synthetic biology because of its extensive applications. For instance, in September 2022, the Government of New South Wales announced an investment of over USD 6.0 million into a new synthetic biology and biomanufacturing development program, which would improve access to manufacturing and production facilities and equipment across the State of Wales, Australia.

Similarly, many research studies and projects concerning synthetic biology have been running in various countries that have tried to tap multiple complexities in the genomes of organisms, which has helped create more effective and efficient therapies to treat them. For instance, in the United States, SynBio research funding increased from USD 161.0 million in 2022, with public funding totaling USD 820.0 million over the last five years for synthetic biology research. Similarly, the White House of the United States issued an executive order in September 2022, launching a national biotechnology and biomanufacturing initiative that placed synthetic biology as a centerpiece of the strategies for sustainability, competitiveness, and economic growth across all levels of government. The order’s impact could be far-reaching, including significant investments

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in developing medicines and commodities, reducing waste, and advancing sustainable farming while mitigating climate change impacts.

Synthetic biology technologies and products are also significantly used in various application areas. Since the organisms engineered with synthetic biology techniques are relatively reasonable, owing to their use in various industrial applications, which also translates into a reduction in the cost of research, the demand for these techniques is growing worldwide. Therefore, owing to the aforementioned factors, such as increasing investment in research related to synthetic biology, the market is anticipated to witness growth during the forecast period.

However, factors such as biosafety and biosecurity, ethical issues, and reimbursement cuts, which cause pricing pressure, will likely impede market growth.

Synthetic Biology Market Trends

The Healthcare Segment is Expected to Witness Significant Growth During the Forecast Period

The rapid development of synthetic biology has driven the healthcare industry to consider the varied therapeutic approaches using live bacteria, artificial cells, and engineered phages. For instance, it has enabled life technologies to design and manufacture antigens and variants with rapid results, high expression, and capacity. Synthetic biology has several applications, including drug and vaccine development to applications manufacturing and diagnostic tests. For instance, a study published in the Journal BMJ in March 2023 stated that the United States invested over USD 31.9 billion in developing, producing, and purchasing the mRNA COVID-19 vaccines, including significant investments through March 2022.

Various initiatives from governments and other organizations are expected to influence the market in this segment positively. For instance, in July 2022, SynbiCITE, the National Centre for the Industrial Translation of Synthetic Biology in the United Kingdom, received a grant of USD 6.6 million (GBP 5.5 million) from SynBioVen. The funding would enable the Imperial-hosted Center to continue to support synthetic biology startups and small and medium enterprises, strengthen the emerging economy of the United Kingdom, and unlock the societal benefits of synthetic biology. In June 2023, scientists at the International Society for Stem Cell Research’s annual meeting showcased the creation of synthetic human embryos using stem cells in a groundbreaking advance that sidesteps the need for eggs or sperm. Scientists

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mentioned that these model embryos, which resemble those in the earliest stages of human development, could provide a crucial window into the impact of genetic disorders and the biological causes of recurrent miscarriage. Thus, such developments in healthcare related to synthetic biology are expected to boost the segment growth.

Therefore, the healthcare segment is expected to witness significant growth during the forecast period due to the abovementioned factors, including the active research and developments in synthetic biology for healthcare areas.

North America is Expected to Witness Significant Growth During the Forecast Period

North America is estimated to witness significant growth in the synthetic biology market due to the increasing demand for bio-based products, increased investments in synthetic biology companies, and rising R&D funding for synthetic biology. The United States contributes majorly to the research in drug discovery, genomics, and proteomics structure prediction, and soon in the region, thereby boosting the growth of the synthetic biology market.

Various universities and research institutes received funding from governmental organizations, such as the National Institute of Health (NIH), and private organizations, like the Gates and Melinda Foundation, for developing various bioinformatics, DNA sequencing and biological components, and integrated systems devices, which can be widely used for various healthcare and other applications. In October 2022, the Government of Canada invested over USD 4.13 million (CAD 5.6 million) to support the early-stage genomics companies in bringing new products to market. This would boost genetic engineering or synthetic biology involving molecular biosciences with computing, automation artificial intelligence (AI), and miniaturization.

In September 2022, the United States Department of Energy (DOE) invested USD 178 million in bioenergy research to advance sustainable technology breakthroughs, improve food and agricultural production and public health, address climate change, and create more resilient supply chains. This investment would support cutting-edge biotechnology R&D of bioenergy crops, industrial microorganisms, and microbiomes. Also, increasing government and private institutions' support and R&D investments in drug discovery and development are major growth factors expected to drive the market during the forecast period.

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Therefore, owing to the aforementioned factors, such as the increasing focus on synthetic biology research, the market is anticipated to grow in North America.

Synthetic Biology Industry Segmentation

The synthetic biology market is moderately consolidated due to a few companies operating globally and regionally. The competitive landscape includes an analysis of some international and local companies that hold market shares and are well known, including Genscript, Thermo Fisher Scientific Inc., Amyris Inc., Danaher Corporation (Integrated DNA Technologies Inc.), and Illumina Inc., Precigen Inc. (Intrexon Corporation), New England Biolabs Inc., Novozymes AS, Koninklijke DSM NV, and Viridos, Inc. (Synthetic Genomics Inc.).

Additional Benefits:

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