DNA Data Storage: Global Markets and Technologies

Market Research Report | 2023-02-06 | 157 pages | BCC Research

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Report description:

Description

Report Scope:

The scope of the report includes DNA data storage technologies, applications, industries, initiatives, patents, and companies. The market estimates for DNA data storage products and services are provided for 2020 as the base year, 2021, and forecast through year-end 2027.

This report reviews DNA data storage technologies, including DNA read and write technologies. It then discusses significant large-scale research initiatives that impact DNA storage, read, and write applications. The main market driving forces for DNA data storage products and services are discussed.

The report quantifies each of the main market segments for DNA data storage according to the following segments: by type (commercial, research, and prototyping); by deployment (cloud, on-premise); by application (archival, quality control, research, and prototyping); by end user (banking, financial services, and insurance; government and defense; healthcare and pharma; media and entertainment; and other); by sequencing platform (next generation sequencing, nanopore sequencing); by synthesis platform (chemical-column based; chemical-microchip based; enzymatic); and by geography (Asia-Pacific, Europe, North America, and Rest of the World).

The report also includes profiles of the key companies in the DNA data storage industry. In addition, BCC Research provides a summary of the main industry acquisitions and strategic alliances from January 2019 through December 2022, including key alliance trends.

Report Includes:

- 57 tables
- An up-to-date overview and analysis of the global markets for DNA data storage technologies
- Analyses of the global market trends, with historic revenue data from 2019 to 2021, estimates for 2022, and projections of compound annual growth rates (CAGRs) through 2027
- Highlights of the market potential for global DNA data storage technologies market, growth driving factors, and areas of focus to forecast this market into various segments and subsegments
- Estimation of the actual market size and revenue forecast for global DNA data storage market in USD million terms, and corresponding market share analysis by type, component, application, deployment, sequencing platform, end-user industry and region
- Understanding of the DNA data storage technologies; DNA sequencing (read) and synthesis (write) technologies; industry structure; large-scale DNA read, write and storage initiatives and population-scale sequencing projects
- Discussion of the major market dynamics, key shifts and regulations, industry specific challenges, and other region-specific macroeconomic factors shaping the market demand for DNA data storage technologies over the coming years (2022-2027)
- Identification of the companies that are best positioned to meet this demand because of their proprietary technologies, strategic alliances, or other advantages
- Updated information on recent mergers, acquisitions, collaborations, agreements, partnerships, product launches, and expansions in the global market
- Company profile descriptions of leading industry players, including 10x Genomics Inc., Agilent Technologies Inc., Illumina Inc., and Twist Bioscience Corp.

Executive Summary

Summary:

DNA data storage involves decoding and encoding DNA-related information from strands of synthesized DNA. DNA contains the genetic blueprint for living organisms and cells. In data storage, binary digits are an electronic technology that generates, processes, and stores data. In the process of coding for DNA data storage applications, each single binary bit is converted into A, C, G, and T letters from 1 to 0 numbers. The letters A, C, G, and T represent the four primary molecules present in DNA: adenine, cytosine, guanine, and thymine.

DNA data storage systems are compact, with much higher storage density than tape or hard drive storage systems. DNA data storage systems offer extremely long life. Furthermore, because DNA is relevant to all living systems, the technology for reading and writing in this media will never become obsolete or outdated. All of these features make DNA data storage systems extremely attractive as potential next-generation data storage platforms.

The DNA data storage industry is still in its infancy but is showing significant progress in its development. Rapid progress in several key enabling technologies, including DNA synthesis, DNA sequencing, and coding, is driving market development. Significant support from government-funded initiatives is enabling the development of prototype end-to-end DNA data storage systems.

Citing the current digital era, the data quantity generated is increasing exponentially with global data storage demand anticipated to reach REDACTED GB by 2025. (Source: Light: Science & Applications (2014), 3 (5), e177CODEN: LSAIAZ; ISSN:2047-7538. (Nature Publishing Group)) Hence, demand for denser and long-life information storage devices is also rising and can be handled by DNA data storage technology. Further research and substantial advances in biotechnology have significantly accelerated the development of DNA data storage technologies. These include advances in chemical and enzymatic DNA synthesis, DNA Sequencing platforms, and polymerase chain reaction (PCR) for DNA amplification.

These technologies were not initially designed for digital data storage. However, considerable developments have now made it possible to write, read, access, and edit data encoded in DNA sequences.

DNA's enormous potential to help solve the coming worldwide data crunch makes this a significant market opportunity. As much as REDACTED% of digital data worldwide has been generated in the past two years, and the pace of data generation is increasing given the growth in search engines, social media sites, smart cars, and the Internet of Things. For example, Google receives more than REDACTED searches per second on any given day and WhatsApp users exchange as many as REDACTED messages every day. Conventional storage devices, including magnetic tapes, hard drives, and optical discs, are approaching their density limits, can be damaged, and have limited life spans. Magnetic tapes, used for most digital archives, have a maximum life span of fewer than REDACTED.

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CATALOG TECHNOLOGIES INC.
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DEPIXUS
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DOVETAIL GENOMICS LLC
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