

Bioinformatics - A Global Market Overview

Market Report | 2025-04-08 | 223 pages | Industry Experts

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Report description:

Bioinformatics Market Trends and Outlook

Bioinformatics is an interdisciplinary field combining biology, computer science, mathematics, and statistics to analyze large-scale molecular data, such as DNA sequences and protein structures. It plays a vital role in genomics, transcriptomics, proteomics, metabolomics, and molecular phylogenetics, supporting gene sequencing, protein structure prediction, and disease research. Various bioinformatics databases, including GenBank, UniProt, Protein Data Bank (PDB), KEGG, and OMIM, organize biological information for research on genetic variation, metabolic pathways, and disease mechanisms. Advanced tools like BLAST, ClustalW, MEGA, PyMOL, and InterProScan facilitate sequence alignment, structural modeling, phylogenetic analysis, and functional annotation.

Computational platforms such as Bioconductor, GROMACS, and Rosetta are commonly used for NGS (next-generation sequencing) data analysis, molecular simulations, and protein folding predictions. Bioinformatics speeds up drug discovery through cheminformatics, AI-driven biomarker identification, and personalized medicine applications. It enhances agricultural biotechnology by optimizing crop genetics, pest resistance, and microbial ecosystem analysis while supporting environmental research in bioremediation and climate adaptation. Furthermore, bioinformatics supports forensic science through DNA analysis and evolutionary biology by reconstructing phylogenetic relationships. Integration of AI, deep learning, and cloud computing is driving advancements in bioinformatics, revolutionizing healthcare, biotechnology, and biomedical research by enabling predictive analytics and high-throughput data processing.

Global Bioinformatics market is estimated at US\$15.1 billion in 2024 and anticipated to record a CAGR of 13.8% from 2024 to 2030 to reach US\$32.8 billion in 2030. The bioinformatics market is driven by advancements in next-generation sequencing (NGS), artificial intelligence (AI), and big data analytics, enhancing data processing capabilities and storage. The increasing focus on precision medicine is driving the demand for bioinformatics in clinical research and drug development. A rise in public and private funding is fueling advancements in genomics research, biomarker identification, and personalized therapy. Pharmaceutical and biotechnology companies integrate bioinformatics to improve drug development processes and optimize clinical trials.

Applications in agriculture and environmental sciences, such as crop genome editing and biodiversity monitoring, are expanding

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market scope. Cloud computing and AI-driven platforms enable high-throughput analysis, improving accuracy and efficiency. The declining cost of genome sequencing is enhancing accessibility and fostering research collaborations. Machine learning is revolutionizing genomic data analysis with predictive modeling and precision diagnostics. The increasing amount of multi-omics data is driving the need for sophisticated computational tools to handle complex biological information. Bioinformatics is crucial for synthetic biology, molecular diagnostics, and evolutionary research, driving future advancements in life sciences.

Bioinformatics Regional Market Analysis

North America leads the bioinformatics market in 2024, accounting for an estimated market share of 41.5%, driven by the U.S. and Canada due to their strong research institutions, academic centers, and bioinformatics firms. The region benefits from significant R&D investments, supportive government policies, and leading companies. Government-backed initiatives like the NIH-funded Human Genome Research Project further support this market expansion. Conversely, Asia-Pacific is the fastest-growing region, projected to record a 14.9% CAGR during the forecast period 2024-2030. This surge can be attributed to rapid advancements in biotechnology, increased government support, and a heightened emphasis on personalized medicine, with China and India at the forefront of the market. The expanding IT sector in the region, combined with a growing number of bioinformatics professionals, enhances its capability to provide outsourcing services to developed nations.

Bioinformatics Market Analysis by Product & Services

Biocontent management is the largest segment in the bioinformatics market, with a 36.2% share in 2024, driven by the widespread use of bioinformatics tools for efficient database management, seamless data sharing, and integration with external resources. This dominance is fueled by increasing reliance on web servers and software for storing, retrieving, and refining complex biological data, alongside the adoption of genome sequencing technologies due to declining costs. Meanwhile, the bioinformatics services segment is projected to grow at the fastest CAGR of 15.4% from 2024 to 2030, driven by the rising need for specialized expertise in genomic analysis, personalized medicine, and clinical trials. Outsourcing bioinformatics services is gaining traction, offering tailored solutions and deep analytics for research and healthcare applications.

Bioinformatics Market Analysis by Application

Genomics dominates the bioinformatics application market with a 22.7% share, driven by advancements in sequencing technologies, rising government investments, and growing demand for pharmacogenomics. It plays a crucial role in personalized medicine, drug discovery, and disease diagnostics by enabling large-scale genomic data analysis. Next-generation sequencing (NGS) accelerates genetic mapping and cancer research, enhancing precision medicine. Meanwhile, the cheminformatics segment is projected to grow at a 15.5% CAGR from 2024 to 2030, driven by rising biomarker discovery, AI-powered drug design, and cost-efficient drug development. It enhances drug-receptor interaction analysis, streamlines discovery pipelines, and integrates predictive analytics. The pharmaceutical industry's shift toward data-driven methodologies further propels cheminformatics adoption.

Bioinformatics Market Report Scope

This global report on Bioinformatics analyzes the market based on product & services, and application for the period 2021-2030 with projections from 2024 to 2030 in terms of value in US\$. In addition to providing profiles of major companies operating in this space, the latest corporate and industrial developments have been covered to offer a clear panorama of how and where the market is progressing.

Key Metrics

Historical Period: 2021-2023

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Base Year: 2024

Forecast Period: 2024-2030

Units: Value market in US\$

Companies Mentioned: 18

Bioinformatics Market by Geographic Region

- North America (The United States, Canada, and Mexico)
- Europe (Germany, France, the United Kingdom, Italy, Spain, and Rest of Europe)
- Asia-Pacific (Japan, China, India, South Korea, and Rest of Asia-Pacific)
- South America (Brazil, Argentina, and Rest of South America)
- Rest of World

Bioinformatics Market by Product & Services

- Biocontent Management
- Bioinformatics Platforms
- Bioinformatics Services

Bioinformatics Market by Application

- Genomics
- Chemoinformatics & Drug Design
- Proteomics
- Transcriptomics
- Metabolomics
- Molecular Phylogenetics
- Other Applications (Including Clinical & Precision Medicine Bioinformatics, Agricultural & Environmental Bioinformatics, Forensic Bioinformatics, and more)

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3. Key Global Players

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- Agilent Technologies, Inc
- BGI Group
- Bio-Rad Laboratories, Inc.
- Dassault Systems SE
- DNAnexus, Inc.
- DNASTAR, Inc.
- Eurofins Scientific SE
- Fios Genomics Ltd.
- Genedata AG
- Illumina, Inc.
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