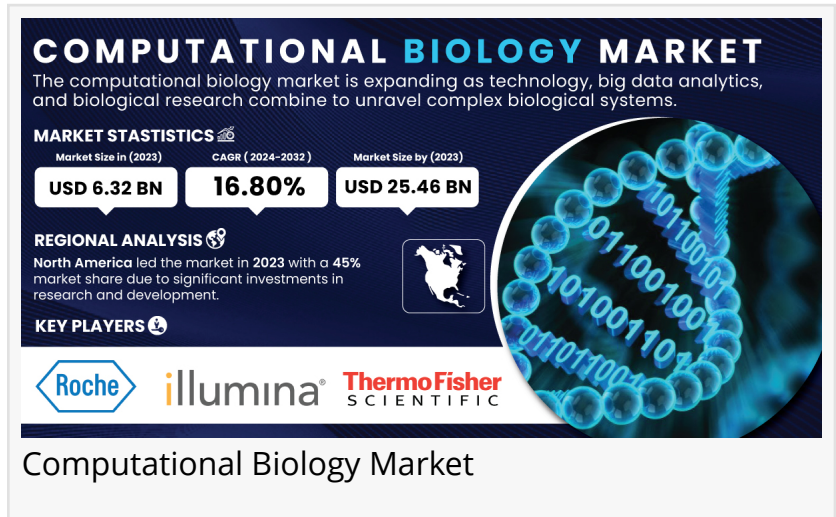# Computational Biology Market Exploded to Reach USD 25.46 Billion by 2032 at a CAGR of 16.80% | SNS Insider

Computational Biology Market Headed For Rapid Growth By Integrating Genomics, AI Technology And Big Data Analytics

AUSTIN, TX, UNITED STATES, December 6, 2024 /EINPresswire.com/ -- The Global [Computational Biology Market](#) is expected to grow at a tremendous rate, with a value of USD 6.32 billion in 2023 and is projected to reach USD 25.46 billion by 2032, at a Compound Annual Growth Rate (CAGR) of 16.80% from 2024 to 2032.

COMPUTATIONAL BIOLOGY MARKET

The computational biology market is expanding as technology, big data analytics, and biological research combine to unravel complex biological systems.

MARKET STASTISTICS

Market Size in (2023): USD 6.32 BN
CAGR (2024-2032): 16.80%
Market Size by (2023): USD 25.46 BN

REGIONAL ANALYSIS
North America led the market in 2023 with a 45% market share due to significant investments in research and development.

KEY PLAYERS
Roche, illumina, ThermoFisher SCIENTIFIC

Computational Biology Market

The rapid growth of the computational biology market has emerged as a game-changer transformation of the way scientists can analyze complex biological systems, especially in genomics. In the field of oncology and rare disease research, 65% of cancer-related studies and 80% of rare disease studies utilize genomics to detect mutations that result in genetic alterations, improved diagnosis, and personalized treatments. Precision medicine has revolutionized American hospitals, with 90% of hospitals adopting the system, and the workforce expands by 12% yearly to accommodate the rising needs.

Further substantial investments include USD 3.5 billion from the National Institutes of Health and USD 1.5 billion for the All of Us Research Program which will further show the government's commitment to advancing genomic research. Computational biology has transformed the pharmaceutical industry by fast-tracking drug discovery processes, hence saving a lot of costs and time compared to traditional discovery. By modeling biological pathways, researchers are identifying novel drug targets for complex diseases like cancer and neurodegenerative disorders, driving the development of precision therapeutics.

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Key Computational Biology Market Players:
F. Hoffmann-La Roche Ltd
Illumina Inc.
Thermo Fisher Scientific Inc.
Dassault Systèmes
Genedata AG
Chemical Computing Group
Schrodinger Inc.
Certara Inc.
Insilico Medicine
Nimbus Therapeutics
Compugen Ltd.
GNS Healthcare
Evotec SE
Genomatica Inc.
3BioMed and other key players.

Advances In Bioinformatics Tools And Artificial Intelligence (AI) Are Driving The Computational Biology Market

Solutions such as BLAST and Bioconductor allow for efficient data analysis in increasingly complex biological datasets. AI improves prediction models for drug interactions, protein folding, and genetic sequencing and delivers faster and more accurate results. Cloud computing also allows for big data analysis without increasing costs and time taken. Integration of next-generation sequencing technologies has made advanced bioinformatics tools an absolute necessity to further assert the role of computational biology in modern science and medicine.

Segment Analysis

By Service:
The Software Platforms segment dominated in 2023 with a 40% market share, driven by the demand for molecular modeling, sequence analysis, and systems biology tools. Leading platforms like Thermo Fisher Scientific's Ion Torrent Software Suite and Illumina's BaseSpace have empowered researchers in genomics and proteomics. The rising complexity of biological data and the growth of personalized medicine have further fueled the segment's prominence. Meanwhile, the databases segment is expected to grow at the fastest pace during 2024–2032 and address the burgeoning need for structured biological data storage and retrieval as NGS and genomics move forward.

By End-user:
The Industrial segment dominated 59% of the market in 2023, with pharmaceutical and biotech companies such as Pfizer and Roche. Computational biology accelerates drug discovery

timelines and costs by predicting models and simulating clinical trials. The academic & research segment is expected to grow considerably due to increased adoption of computational tools for genomic and proteomic research. Universities make use of platforms like Thermo Fisher Scientific's bioinformatics software to accelerate the development of personalized medicine and disease modeling.

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Key Market Segments

By Service
Databases
Infrastructure & Hardware
Software Platforms

By Application
Drug Discovery & Disease Modelling
- Target Identification
- Target Validation
- Lead Discovery
- Lead Optimization
Preclinical Drug Development
- Pharmacokinetics
- Pharmacodynamics
Clinical Trials
Computational Genomics
Computational Proteomics
Others

By End-User
Academic & Research
Industrial

Regional Insights

North America dominated the market in 2023 with a share of 45% based on significant R&D investment and also an extraordinarily strong biotechnology ecosystem. Industry leaders like Thermo Fisher Scientific, IBM Watson Health, and so forth enable innovation at the genomics and drug discovery levels. The government's precision medicine programs, along with others, further strengthen its hold over the region.

The Asia-Pacific region is set to be the fastest growing region from 2024-2032, driven by

enhanced healthcare investments, including advancements in biotechnology for the China, India and Japan regions. Local partnerships with international companies are catalyzing progress in disease modeling and drug discovery. Companies such as WuXi AppTec and Infosys are continuing to grow their bioinformatics and computational biology offerings, building on regional growth.

Recent Market Developments

May 2023: Roche establishes the Institute of Human Biology, a multidisciplinary initiative that harnesses biology, technology, and data science for breakthroughs in drug discovery and personalized medicine. The IHB is a bridge between academia and industry, focusing on cutting-edge research for complex diseases.

April 2023: Insitro released a new computationally-based platform to boost research in Non-Alcoholic Steatohepatitis, which uses advanced machine learning algorithms to simulate the disease's progression in order to streamline therapeutic discoveries for this critical condition.

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