

# U.S. Computational Biology Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

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## Abstracts

U.S. Computational Biology Market was valued at USD 3.2 billion in 2024 and is estimated to grow at a CAGR of 11.7% to reach USD 9.5 billion by 2034.

The strong growth of this market is driven by continuous advancements in artificial intelligence and machine learning applications within healthcare, expanding genomics and proteomics research, increasing focus on drug discovery and development, and the rising adoption of personalized and precision medicine. Computational biology combines computing technologies, mathematical modeling, and statistical methods to interpret complex biological information and generate meaningful insights. It plays an essential role in studying biological systems such as genomes, proteins, and cellular networks, enabling scientists to uncover intricate molecular interactions and biological pathways. The discipline merges biology, computer science, and quantitative analytics to accelerate biomedical innovation and research outcomes. As omics technologies continue to generate vast amounts of biological data, the reliance on computational biology tools and platforms is growing rapidly. Researchers are increasingly using bioinformatics algorithms and analytical frameworks to interpret large-scale datasets, identify disease markers, and accelerate drug target validation. This expanding data complexity is expected to propel sustained market growth in the coming decade.

The databases segment generated USD 1.1 billion in 2024 and is projected to grow at a CAGR of 12% from 2025 to 2034. This growth stems from the rapid generation of genomic, proteomic, and multi-omics datasets that require efficient systems for secure storage, integration, and management. The increasing need for centralized, easily accessible, and interoperable repositories is crucial for supporting life science research, enabling smooth data sharing across institutions, and fostering collaborative

development among biotechnology and pharmaceutical firms. As a result, the growing focus on standardized and scalable data management systems is strengthening the role of database solutions within computational biology.

The drug discovery and disease modeling segment is forecasted to grow at a CAGR of 12.1% through 2034. The segment's expansion is largely attributed to the use of integrated multi-omics data for identifying new therapeutic targets and understanding the underlying mechanisms of diseases. Incorporating artificial intelligence and machine learning enhances predictive precision, enabling researchers to model disease progression and accelerate the discovery of potential drug candidates more efficiently. This approach supports the broader shift toward data-driven, hypothesis-based research in pharmaceutical innovation.

South Atlantic Computational Biology Market held a 20.8% share in 2024. This region's dominance can be attributed to the strong presence of research universities, advanced hospitals, and biotechnology centers located across states such as Maryland, Georgia, and North Carolina. The concentration of academic research institutions and clinical centers in the area has led to significant demand for computational biology platforms in genomics, proteomics, and drug development. Additionally, the presence of leading biotech and pharmaceutical organizations has contributed to greater investment in computational infrastructure, fostering innovation in biological simulation, predictive modeling, and large-scale data analysis.

Major companies operating in the U.S. Computational Biology Market include Strand, GINKGO, QIAGEN, BIO-RAD, Illumina, Benevolent, DNAnexus, Compugen, Schrödinger, Instem, Thermo Fisher Scientific, Deep Genomics, Genedata (Danaher), Dassault Systèmes, and Certara. Leading players in the U.S. Computational Biology Market are strengthening their competitive edge through advanced technology integration, strategic collaborations, and investments in digital infrastructure. Many firms are focusing on AI- and ML-driven platforms to enhance modeling accuracy and predictive analysis in drug discovery. Partnerships with biotechnology firms, academic research institutes, and healthcare organizations enable knowledge exchange and innovation acceleration. Companies are also emphasizing product portfolio diversification by offering scalable bioinformatics tools, cloud-based data management systems, and simulation software tailored for pharmaceutical R&D.

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