Computational Biology Market to reach USD 27.22 Billion by 2035 at 13.5% CAGR

Computational Biology Market to Surge from USD 8.71 Billion in 2026 to USD 27.22 Billion by 2035---Powered by Multi-Omics Data Growth, AI Foundation Models

NY, CA, UNITED STATES, September 21, 2026 /EINPresswire.com/ -- As per Market Research Future, the global Computational Biology Market size is projected to reach USD 27.22 Billion by 2035 from USD 8.71 Billion in 2026, at a CAGR of 13.5% during the forecast period 2026--2035. The market base was estimated at USD 7.71 Billion in 2025.

The 13.5% CAGR---anchored by structural shifts in data-driven life-science research---is propelled by three converging forces: explosive growth in multi-omics data volume, with genomics, proteomics, and metabolomics outputs overwhelming legacy analysis infrastructure and pushing institutions toward commercial computational platforms; the rise of foundation models for protein and genome prediction, including transformer-based genome language models and GPU-accelerated molecular docking, which are fundamentally changing the economics of early-stage drug discovery; and the regulatory legitimisation of in-silico evidence, led by the FDA Modernization Act 2.0, which removed the statutory requirement for animal testing in drug applications and established computational models as a primary submission artifact.

Global technology and life-science companies are amplifying this momentum. Dassault Systèmes and Certara together spent more than USD 900 million on R&D across 2024--2025 to rebuild their platforms around foundation-model architectures, while Siemens' USD 5.1 billion acquisition of Dotmatics signaled that industrial software vendors now treat life-science data as core infrastructure. The National Institutes of Health committed roughly USD 4.1 billion annually to data-intensive biomedical research infrastructure, much of it flowing into cloud-native analysis pipelines, and NIH extramural awards exceeded USD 33 billion in 2024. These forces are creating the funding flows and platform demand on which the Computational Biology Market depends.

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Key Market Trends & Growth Drivers

Explosive Growth of Multi-Omics Data

The market is witnessing an exponential surge in data generated by omics technologies. Genomics, proteomics, metabolomics, and transcriptomics outputs are growing faster than institutional infrastructure can absorb, driving demand for scalable analysis platforms. Multi-omics data volume growth alone contributes an estimated 2.8 percentage points to market CAGR, making it the single most impactful near-term driver. Sponsors now run in silico triage before committing wet-lab resources, and vendors are pricing their platforms accordingly.

AI Foundation Models Reshaping Prediction

Foundation models are becoming a hallmark of the industry. Transformer-based genome language models, GPU-accelerated docking, and digital twins of cellular systems are displacing spreadsheet-bound sequence annotation and hand-curated pathway maps. Machine-learning and AI technologies in biology contribute an estimated 2.5 percentage points to CAGR, with impact concentrated in North America, Europe, and Asia-Pacific. Dassault Systèmes continues rebuilding its simulation platforms around foundation-model architectures to capture this shift.

Regulatory Legitimisation of In-Silico Evidence

The incorporation of computational evidence into regulatory submissions is gaining traction. The FDA Modernization Act 2.0 removed the statutory requirement for animal testing in drug applications, legitimising in-silico evidence as a primary submission artifact. Certara continues investing in regulator-ready model qualification, positioning computational evidence at the center of modern drug development workflows.

Expansion of Cloud and Exascale HPC

The rising availability of cloud and exascale high-performance computing is a primary enabler. Cloud-native analysis pipelines and sovereign supercomputing programmes are lowering the barrier to large-scale biological simulation. Asia-Pacific's national supercomputing initiatives in China, Japan, and India are propelling the region to the fastest growth outlook, while pharmaceutical R&D outsourcing to platform CROs adds a further layer of demand.

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Market Segment Insights

BY APPLICATION

Cellular and Biological Simulation: Largest segment with 29.8% share in 2025, underpinning downstream computational genomics workflows, pathway reconstruction, and phenotype

prediction.

Drug Discovery and Disease Modelling: Fastest-growing segment, forecast to expand at a 16.4% CAGR through 2035 as structural prediction changes the economics of early screening.

Preclinical Drug Development: Contributed USD 1.42 billion in 2025 revenue, driven by pharmacokinetic and toxicology prediction.

Clinical Trials and Human Body Simulation: Positioned as a high-growth entry at a 14.1% CAGR, supporting trial design optimisation and virtual control arms.

BY TOOL

Databases: Largest segment, commanding a 33.4% revenue share in 2025, as subscription access to curated reference and annotation resources remains non-negotiable for most workflows.

Analysis Software and Services: Fastest-growing segment, compounding at a 15.5% CAGR to 2035 as buyers outsource pipeline maintenance and vendors bundle compute into software contracts.

Infrastructure and Hardware: Significant segment at USD 1.86 billion in 2025, reflecting GPU cluster and cloud tenancy demand.

BY SERVICE MODEL

Contract / Outsourced: Largest segment, representing 48.4% of delivery spend in 2025, supported by talent scarcity, cost efficiency, and access to specialised expertise.

In-House: Fastest-growing segment, registering a 16.8% CAGR from 2026 to 2035 as large pharmaceutical organisations internalise platform capabilities.

BY END USER

Academics: Largest segment with a 41.0% share in 2025, a legacy of decades of grant-funded tool adoption and research computing.

Industry and Commercial: Fastest-growing segment, expanding at a 15.3% CAGR, as pharmaceutical pipeline productivity pressure pushes commercial buyers to pay more per seat.

Government and Regulatory: Significant segment at USD 1.13 billion in 2025, reflecting public health surveillance and regulatory review capacity needs.

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Regional Outlook

North America --- Market Leader in Innovation

North America leads with a 39.3% share of global revenue in 2025, generating around USD 3.03 billion. The region's growth is driven by mature biotech regulation, the deepest pool of venture-funded platform firms, and procurement depth from public research funding. The US accounts for 84.5% of regional revenue, with NIH extramural awards exceeding USD 33 billion in 2024 and a material share funding data-generation projects that require commercial analysis platforms. The competitive landscape is characterised by continuous platform innovation and regulatory model qualification among leading simulation and data firms.

Europe --- Second Largest Market

Europe accounted for 26.8% of global revenue in 2025, representing the second-largest regional market. The region benefits from institutional research demand, federated infrastructure such as ELIXIR nodes, and GDPR-compliant analytics architectures. Horizon Europe allocated roughly EUR 8.2 billion to its health cluster for 2021--2027, with data infrastructure a recurring line item. Leading countries include Germany (22.4% of regional revenue), the UK (USD 0.42 billion), and France, where major platform vendors are heavily invested.

Asia-Pacific --- Rapidly Growing Market Segment

The Asia-Pacific region posts the fastest growth outlook at a 17.1% CAGR through 2035, propelled by national supercomputing programmes and sovereign genomics funding. China contributes 33.6% of regional revenue through state genomics programmes and domestic sequencing capacity, while India records an 18.9% CAGR backed by GenomeIndia and biotech services growth. Countries like Japan (USD 0.36 billion) and South Korea are experiencing a surge in demand, creating an import window that international platform firms are moving to occupy.

Middle East and Africa --- Untapped Potential

The MEA region held around USD 0.32 billion in 2025, driven by sovereign genome programmes and hospital digitisation. Saudi Arabia anchors the region with 27.3% of regional revenue through its Saudi Genome Program under Vision 2030, while the UAE records a 17.6% CAGR supported by the Emirati Genome Programme. South Africa (USD 0.06 billion) and Egypt contribute through pathogen genomics and national reference laboratory expansion, with a growing presence of international platform companies.

Competitive Landscape and Recent Developments

The Computational Biology Market is characterised by moderate concentration and rapid platform consolidation, driven by the shift of life-science data to core infrastructure status. Market Research Future estimates a Herfindahl-Hirschman Index in the 700--900 range, with the top five vendors holding roughly 30--36% of global revenue---a handful of diversified simulation and data platforms sit above a long tail of specialist firms serving single applications.

KEY COMPANIES AND RECENT MILESTONES

Dassault Systèmes (FR): Together with Certara, spent more than USD 900 million on R&D across 2024--2025 to rebuild its platforms around foundation-model architectures. Continues advancing next-generation simulation and modelling solutions for life sciences.

Siemens (DE): Completed its USD 5.1 billion acquisition of Dotmatics, signalling that industrial software vendors now treat life-science data as core infrastructure and accelerating its computational biology portfolio expansion.

Certara (US): Continues investing in regulator-ready model qualification and biosimulation platforms, supporting the industry's transition toward in-silico evidence in regulatory submissions.

Schrödinger (US): Advances physics-based computational chemistry and machine-learning platforms for drug discovery, strengthening its position across molecular modelling and simulation.

Thermo Fisher Scientific (US) and Illumina (US): Continue bridging instrument-installed bases with downstream computational analysis, capturing analytics demand generated by sequencing and laboratory workflows.

Other Key Players: Simulations Plus (US), Genedata (CH), Chemical Computing Group (CA), Insilico Medicine (HK), Instem (GB).

Future Outlook: 2026--2035

The Computational Biology Market is projected to reach USD 27.22 billion by 2035, growing at a CAGR of 13.5%, driven by multi-omics data volume growth, foundation models reshaping biological prediction, and regulatory acceptance of in-silico evidence.

New opportunities lie in:

Regulator-ready model qualification as a service
Emerging-market genomics build-out

Federated data monetisation across sovereign borders
By 2035, the Computational Biology Market is expected to achieve substantial growth and innovation, defined less by algorithmic novelty than by who controls validated, regulator-ready data pipelines.

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