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US Artificial Intelligence (AI) In Genomics Market - Strategic Insights and Forecasts (2026-2031)

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Abstracts

The US AI in Genomics Market is expected to grow at a CAGR of 33.6%, reaching a market size of USD 5,342.4 million in 2031 from USD 1,256.4 million in 2026.

The US AI in Genomics market is strategically positioned at the intersection of computational biology, cloud computing, and next-generation sequencing. Falling sequencing costs and the exponential growth of multiomic data are primary macro drivers, compelling pharmaceutical, biotechnology, and academic institutions to adopt AI solutions for data analysis and interpretation. Federal initiatives, including guidance from the FDA and research funding from the National Science Foundation, are further accelerating market adoption by setting compliance standards and enabling large-scale AI integration.

Market Drivers

The principal driver of market expansion is the dramatic increase in genomic and multiomic data generation. With the cost of whole-genome sequencing declining rapidly, human analysts are unable to manage the volume and complexity of the data. AI software provides scalable solutions for variant calling, gene annotation, and pathway analysis. Additionally, AI has demonstrated the ability to solve complex biological challenges, including predictive protein folding and gene regulation analysis. This capability is particularly valued in drug discovery and development, where AI accelerates target identification, compound optimization, and disease mechanism understanding. Federal research funding also drives demand for AI-based computational services in academic and research institutions, creating a consistent market pull for commercial AI solutions.

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Market Restraints

The market faces significant constraints related to data quality and model transparency. High-quality, unbiased datasets are scarce, especially for rare genetic conditions, limiting the generalizability of AI models. Furthermore, deep learning models often operate as “black boxes,” creating adoption barriers in clinical settings. These challenges have led to demand for federated learning, secure multi-institutional data processing, and explainable AI (XAI) tools that enhance transparency. Regulatory compliance, including HIPAA and FDA guidance, imposes additional operational requirements but simultaneously creates demand for secure, auditable software solutions.

Technology and Segment Insights

The market is structured around three core offerings: software, services. Software tools focus on AI-driven genomic analysis, predictive modeling, and multiomic data integration. Services include AI model training, data curation, and cloud-based analytics. Applications extend across drug discovery, precision medicine, diagnostics, and agriculture. Pharmaceutical and biotechnology companies represent the largest end-user segment, prioritizing AI to gain proprietary insights from large genomic datasets. Academic and research institutes leverage commercial AI tools to comply with grant requirements and accelerate experimental workflows.

Competitive and Strategic Outlook

The competitive landscape includes established sequencing hardware providers, AI-first TechBio companies, and computational platform vendors. Illumina is expanding from sequencing hardware to integrated AI solutions, exemplified by its BioInsight unit and the SomaLogic acquisition. NVIDIA provides the high-performance computing infrastructure essential for AI model training, maintaining strategic influence over the ecosystem. Deep Genomics leverages foundation models to decode RNA biology, accelerating the discovery of targeted therapeutics. Market competition emphasizes the combination of proprietary data, sophisticated AI algorithms, and platform scalability, signaling a shift from raw data generation to AI-enabled interpretation as the primary value driver.

The US AI in Genomics market is poised for robust growth, driven by large-scale genomic data generation, declining sequencing costs, and regulatory compliance requirements. Adoption of AI software and services is becoming indispensable across

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pharmaceutical, biotechnology, and academic sectors. Technological innovation, particularly in foundation models and explainable AI, will continue to shape the market landscape, solidifying the US as a global leader in AI-enabled genomic analysis.

Key Benefits of this Report

Insightful Analysis: Gain detailed market insights across regions, customer segments, policies, socio-economic factors, consumer preferences, and industry verticals.

Competitive Landscape: Understand strategic moves by key players to identify optimal market entry approaches.

Market Drivers and Future Trends: Assess major growth forces and emerging developments shaping the market.

Actionable Recommendations: Support strategic decisions to unlock new revenue streams.

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Historical Data: 2021-2024, Base Year: 2025, Forecast Years: 2026-2031

Growth opportunities, challenges, supply chain outlook, regulatory framework, and trend analysis

Competitive positioning, strategies, and market share evaluation

Revenue growth and forecast assessment across segments and regions

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Company profiling including strategies, products, financials, and key developments

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