www.curevitajournals.com
ISSN:3107-9997
CUREVITA RESEARCH INTERNATIONAL NEXUS
Peered Reviewed Multidicplinary Journal
VOL.- 2, ISSUE- 1, DEC.- FEB. 2026

The Algorithmic Era of Biotechnology: AI-Driven Healthcare Innovations

Nikita Sharma[1*]

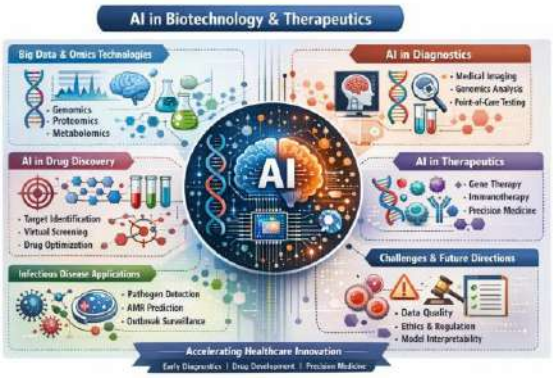
[1]Faculty of Science, Department of Life Science, Rabindranath Tagore University, Raisen- 464993, M.P., India

Abstract:

The integration of biotechnology with Artificial Intelligence (AI) is revolutionizing therapeutic development by overcoming the high costs and long timelines of traditional drug discovery. As biological data grows in complexity, machine learning and deep learning have become essential for precise clinical decision-making. This study explores the synergy between big data, omics technologies, and computational biology, highlighting AI's transformative role in medical imaging, genomic analysis, and point-of-care testing for early disease detection. In drug development, AI streamlines target selection, molecular docking, and ADMET prediction, significantly reducing R&D expenses. These advancements extend to personalized medicine, immunotherapy, and infectious disease management, including antimicrobial resistance prediction. Despite its potential to improve public health and lower costs, the field faces hurdles such as data quality issues, ethical concerns, and model interpretability. Addressing these challenges is vital for the seamless integration of AI-powered biotechnology into global clinical practice and biomedical research.

Keywords: artificial intelligence, transcriptomics, drug discovery, healthcare, biotechnology, diagnostics, data analysis.

Graphical Abstract



ARTICLEINFO

Article history: Received 02 December- 2025, Revised 18 Jan 2026, Accepted 6 Feb 2026, Published: March- 2026.

Author: Dr Nikita Sharma, Assistant Professor, Faculty of Science, Department of Life Science, Rabindranath Tagore University, Raisen- 464993, M.P., India. **Email ID:** nikita.sharma@rntu.ac.in, nikita19196@gmail.com, **ORCiD:** 0000-0002-6964-4491

Publisher: Curevita Research Pvt Ltd

Citation: Sharma Nikita.2026.The Algorithmic Era of Biotechnology: AI-Driven Healthcare Innovations.Curevita Research International Nexus.2,1.1-12.

Core Highlights

- **Integrated Framework:** Developed a robust management model that combines structural, process, and outcome-based indicators to standardize hospital hand hygiene.
- **Metric-Driven Compliance:** Utilizes **Hand Hygiene Quality Indicators (HHQIs)**—including resource availability, staff adherence, and audit frequency—to move beyond simple observation.

- **Validated Methodology:** Employs a **mixed-methods approach** (literature review, expert consultation, and pilot testing) to ensure the framework is both scientifically sound and practically applicable.
- **Patient-Centric Approach:** Incorporates **patient engagement parameters** and infection incidence rates to align hygiene practices directly with clinical outcomes.
- **Accreditation Support:** Designed specifically to help healthcare facilities demonstrate accountability and maintain high standards during international accreditation cycles.
- **Safety Culture Transformation:** Promotes transparency and continuous quality improvement, shifting hand hygiene from a checkbox exercise to a foundational safety culture.