DELL Technologies

Solution Brief

Biomedical Research Assistance

Accelerate Clinical Development With Artificial Intelligence

Clinical development often faces significant challenges in efficiency and accuracy. Managing complex, domain-specific data and navigating intricate reasoning models can slow down progress. The costs of inefficient clinical development can range from thousands to millions of dollars. These bottlenecks lead to delayed drug approvals, wasted research hours, and lost market opportunities. Waiting through lengthy manual processes limits your ability to bring life-changing treatments to patients.

An artificial intelligence research agent helps solve this problem by analyzing real-world data and biomedical literature. This technology accelerates clinical development processes, enabling researchers to generate higher-quality insights. By shifting the heavy lifting of data analysis to intelligent systems, your teams can decrease human hours, improve decision-making, and move forward with confidence.

Drive Research Efficiency with Intelligent Assistance

Using an artificial intelligence approach makes biomedical research more accessible and scalable. It allows you to process vast amounts of scientific literature, clinical trial data, and molecular structures to uncover critical relationships. This capability improves overall efficiency, reduces the time needed for discovery, and strengthens the quality of your clinical trials. It empowers your researchers to focus on high-value analysis and innovation, using your existing data infrastructure to achieve breakthroughs faster.

Key Biomedical Research Use Cases

Biomedical Literature Analysis

Extract, embed, and re-rank information from complex research PDFs. Researchers can use natural language to ask questions and instantly retrieve relevant findings from extensive document libraries.

Molecule Generation & Docking Prediction

Use advanced models to generate new molecules and predict how they will interact with target proteins. This helps researchers simulate and evaluate drug viability before moving to physical testing.

Target Molecule & Protein Search

Quickly identify and evaluate potential targets for drug discovery. The system rapidly scans databases to find the right molecular targets, accelerating the early stages of research.

Automated Report Generation

Synthesize complex research findings, web search results, and database queries into comprehensive, easy-to-read reports that guide clinical decisions.

How it works

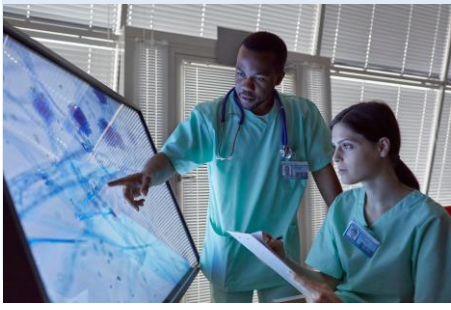
Organizations can carry out a powerful research assistance solution to enhance their clinical development pipelines. This ensures you can quickly process information and make data-driven decisions. To do this, organizations should:

Join Data
Store and organize structured data, unstructured PDFs, and molecular databases on high-performance storage.

Search and Retrieve
Use intelligent agents to retrieve relevant information from internal databases and external web sources.

Reason and Reflect
Apply advanced language models to synthesize the retrieved data, identify patterns, and evaluate potential outcomes.

Generate Insights
Create detailed research reports, visualizations, and recommendations to inform the next steps in the clinical trial process.



An Intelligent Workflow For Research Insights

A modern biomedical research solution relies on an integrated technology stack that delivers scalable, actionable results through an intelligent workflow.

The process begins when a user submits a natural language prompt. A research agent, built with the NVIDIA NeMo Agent Toolkit, interprets the request. The agent orchestrates a series of tasks, calling on specialized tools for web searches, document extraction, and reasoning using advanced models like Llama Nemotron and Llama 3.1.

These agents interact seamlessly with the various engines within the Dell AI Data Platform. The Data Analytics Engine provides access to structured SQL databases. The Data Processing Engine trains and runs machine learning models using NVIDIA RAPIDS. Meanwhile, the Data Search Engine serves as a vector database using NVIDIA cuVS for fast, semantic search. All of this runs on Dell PowerEdge R7725 servers equipped with NVIDIA RTX Pro 6000 GPUs, with data safely stored on Dell PowerScale or ObjectScale. This combination allows researchers to get accurate answers and accelerate their clinical workflows.

Accelerate Enterprise AI with Dell and NVIDIA

The Dell AI Data Platform with NVIDIA, delivers a purpose-built, AI-optimized infrastructure that accelerates innovation and simplifies enterprise AI adoption.

Combining Dell's modular, scalable data engines, high-performance storage, and NVIDIA's industry-leading GPU acceleration, this platform provides unmatched performance, seamless integration, and enterprise-grade security. Couple with Dell Blueprints providing pre-validated architectures that streamline deployment and optimize AI workflows; enterprises can unlock value from all their data, securely and cost-effectively, without the pain of DIY.

Additional Use Case Briefs

Video Search and Summarization

Cataloging Media Assets

Predictive Maintenance

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