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(57) Abstract :
Disclosed herein is an AI-driven method (100) for accelerated drug discovery using genomic data, comprising deploying a network of interconnected AI models to continuously analyze genomic data, drug-target interactions, and biomedical literature. The method (100) also involves utilizing natural language processing, deep learning, and graph neural networks to interpret diverse data sources and generate real-time insights into disease mechanisms and potential drug targets. The method (100) also involves integrating these insights with experimental data, clinical outcomes, and pharmacogenomic information to create a holistic drug discovery intelligence platform. The method (100) also involves employing a reinforcement learning algorithm to dynamically adjust drug discovery strategies based on real-time feedback and experimental results. The method (100) also involves creating adaptive, multi-modal drug screening protocols that self-optimize based on continuous performance analysis. The method (100) also involves implementing a federated learning system for secure, decentralized analysis of genomic data across multiple institutions. The method (100) also involves utilizing quantum computing algorithms for molecular dynamics simulations and binding affinity predictions to accelerate lead optimization.

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