

# Advanced Generative AI Platform Achieves Computational Efficiency Breakthrough in Therapeutic Protein Engineering

SAN FRANCISCO, CA, UNITED STATES, January 6, 2025 /EINPresswire.com/ -- [Ainnocence Inc.](#) introduces its breakthrough [generative AI platform](#) fundamentally transforming therapeutic protein engineering by eliminating traditional computational bottlenecks in drug discovery.

In a significant departure from conventional approaches that rely heavily on time-consuming 3D structural computations, Ainnocence's platform introduces a paradigm shift in protein engineering. Traditional methods require extensive computational resources to model each protein's three-dimensional structure before assessing therapeutic potential. In contrast, Ainnocence's patented innovative approach directly generates optimal therapeutic sequences and predicts binding affinities through advanced language models, bypassing the need for explicit 3D structural calculations.

This groundbreaking methodology enables unprecedented scalability. The platform can simultaneously evaluate interactions between the entire human proteome (over 20,000 proteins) and billions of therapeutic candidates. What traditionally would require years of supercomputing power can now be accomplished in days, with dramatically reduced computational costs.

The platform's efficiency stems from its sophisticated architecture that combines transformer-based language models with structural biology insights. The system processes an impressive 500,000 sequences per hour with minimal latency of 8 milliseconds per sequence. Most remarkably, this is achieved while maintaining high accuracy – over 90% of generated sequences fold into stable structures and can be expressed in common cell lines, and over 40% match desired or better physicochemical properties, all without requiring explicit 3D structural modeling.

"Our platform represents a fundamental rethinking of protein engineering," explains Dr. Lurong Pan, Founder and CEO at Ainnocence. "By eliminating the computational overhead of 3D structural modeling, we've not only accelerated the process but made it possible to explore therapeutic possibilities at a scale previously thought impossible. We can now screen potential interactions across the entire human proteome in a fraction of the time and cost."

The platform demonstrates extraordinary computational efficiency across three key areas:

### Sequence Generation and Optimization:

- Direct generation of therapeutic sequences without 3D modeling
- 95% reduction in computational resources compared to traditional methods
- Capability to screen billions of candidates simultaneously
- Parallel processing enables proteome-wide analysis

### Binding Affinity Prediction:

- Direct sequence-to-affinity prediction without structural docking
- Enables full human proteome on-target/off-target screening against therapeutic candidates

### The platform's impact on drug discovery is transformative:

- 90% reduction in design-to-testing cycle time
- 85% success rate in generating viable therapeutic candidates
- 10x improvement in binding affinity prediction hit rate
- 70% cost reduction in the drug discovery process
- First-ever capability to screen entire human proteome against billions of candidates

### About Ainnocence Inc.

Ainnocence is a next-generation biotech company that uses advanced AI-driven platforms to accelerate drug discovery and molecular design. The company's self-evolving AI platform delivers lightning-fast virtual screening and multi-objective optimization for complex therapeutic modalities, providing transformative solutions in diagnostics and synthetic biology, and beyond. For more information, visit [www.ainnocence.com](http://www.ainnocence.com) or [leave us a message](#).

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