Ainnocence Calls for Collaboration to Deploy AI-Driven Antibody Discovery Against World's Deadliest Infectious Diseases

A Study shows mutation-resistant antibodies with 269×affinity, a proof point for CEPI's 100 Days Mission and closing the therapeutic gap for 2.5B people at risk

SAN FRANCISCO , CA, UNITED STATES, March 6, 2026 /EINPresswire.com/ -- Ainnocence Inc., a biotechnology company pioneering AI-driven therapeutic antibody design, announced the publication of its landmark study, "AI designed, mutation resistant broad neutralizing antibodies against multiple SARS-CoV-2 strains," in Nature Scientific Reports (May 2025). The article demonstrates that artificial intelligence can design antibodies capable of neutralizing viral variants that did not yet exist at the time of design, effectively predicting and pre-empting viral evolution.

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>
> *Dr. Lurong Pan, Founder and CEO of Ainnocence*

What the Study Demonstrated

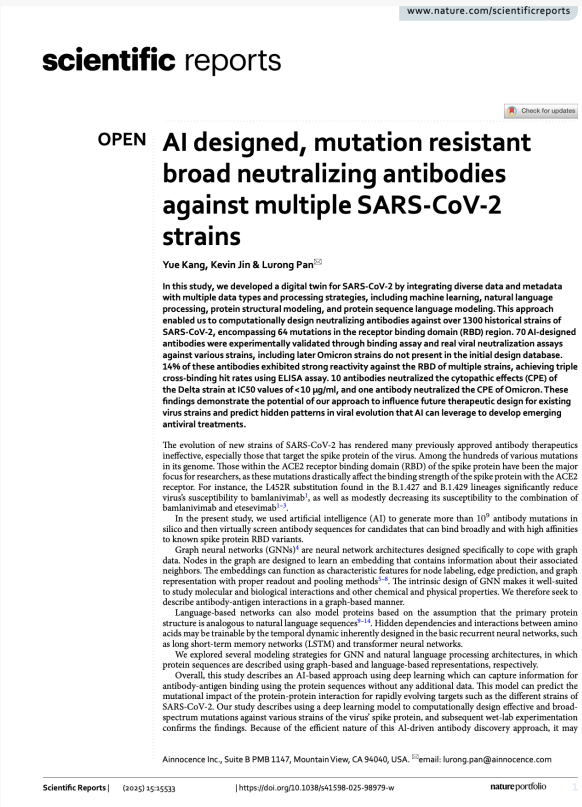
The published research describes the construction of a "digital twin" for SARS-CoV-2, a computational model that integrates protein structural modeling, graph neural networks and protein sequence language modeling to simulate how the virus mutates and how antibodies interact with its spike protein.

Using this digital twin, the Ainnocence team computationally designed neutralizing antibodies against more than 1,300 historical strains of SARS-CoV-2, encompassing 64 distinct mutations in the receptor binding domain (RBD). More than 10^9 antibody mutation candidates were generated and screened in silico before the most promising candidates were selected for experimental validation.

Key findings of the Study:
• 70 AI-designed antibodies were experimentally validated through binding and live viral neutralization assays across multiple SARS-CoV-2 strains.
• 14% showed cross-binding to multiple RBD variants, and 10 antibodies neutralized the Delta

variant (IC□□<10μg/mL), with one antibody neutralizing Omicron despite the variant not being present in the original dataset.
• Sub-nanomolar binding affinity with a 269× improvement over parental antibody candidates was achieved, highlighting the platform's capability for rapid affinity optimization.

"What makes this work significant is not just the binding numbers," said Dr. Lurong Pan, Founder and CEO of Ainnocence. "It is that our AI designed antibodies that worked against viral variants the model had never seen. That is not optimization. That is prediction. And prediction is what you need when the next pandemic pathogen emerges and you have days, not years, to respond."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AI designed, mutation resistant broad neutralizing antibodies against multiple SARS-CoV-2 strains

The SentinusAI® Methodology: Sequence-First, Structure-Free

Ainnocence's proprietary SentinusAI® platform, built on the AINN-P1 protein foundation model, a 167-million-parameter deep learning model trained on more than 53 million protein sequences.

Unlike conventional antibody discovery, antibody discovery approaches that rely on structural data and animal immunization and months of iterative screening; SentinusAI® operate from sequence alone. The platform requires only the amino acid sequence of a target protein to initiate antibody design, no 3D structure, no prior lead compound, no animal model.

The entire pipeline from target sequence input to fully characterized; developability-scored antibody leads operates in approximately 30 days, compared with 3-6 months for traditional methods. This represents an 80% reduction in both timeline and cost, with hit rates reaching 80% vs ~50% for conventional approaches.

Why This Matters for the 100 Days Mission

The Coalition for Epidemic Preparedness Innovations (CEPI) has set what it calls a "moonshot" goal: the 100 Days Mission. Had this capability existed at the start of the COVID-19 pandemic, modeling by Imperial College London suggests that 8million excess deaths and $1.4 trillion in productivity losses could have been averted.

The 100 Days Mission is achievable for vaccines, where platform technologies like mRNA have

already compressed development timelines. But for therapeutic antibodies, which serve as critical first-line countermeasures before vaccines achieve population-scale immunity, no equivalent acceleration technology existed.

Until now.

SentinusAI® is the antibody equivalent of what mRNA platforms achieved for vaccines. When a novel pathogen is identified and its genome sequenced, SentinusAI® can generate therapeutic antibody candidates within 30 days, leaving 70 days within the 100-day window for preclinical validation, manufacturing scale-up, and regulatory filing. The published Nature Scientific Reports data proves this is not theoretical: AI-designed antibodies already neutralized variants that emerged after the design phase, demonstrating exactly the kind of rapid, predictive countermeasure development the 100 Days Mission demands.

“The 100 Days Mission cannot be met with conventional antibody discovery,” said Dr. Pan. “Traditional methods require 12-18 months from target identification to lead candidate. That timeline does not bend to political will. It bends only to fundamentally different technology. SentinusAI® provides that technology and our published results prove it works.”

A Career Built for This Moment

Ainnocence's infectious disease capabilities are rooted in the expertise of founder Dr. Lurong Pan, who holds a PhD in Computational Chemistry (UAB) and an MS in AI (Georgia Tech), with 16+ years at the intersection of computational science, AI, and drug discovery. In 2020, at the height of the COVID-19 pandemic, Dr. Pan was awarded the Merck Pandemic Preparedness Award by Merck KGaA for her “Digital Twin for COVID-19” project, the foundational research that would become the SentinusAI® platform and the basis for the subsequently published Nature Scientific Reports paper.

A Call for Collaboration: 60+ Disease Targets, Zero Approved Antibody Therapeutics: The need is urgent and the gaps are staggering. More than 2.5 billion people live in regions where the deadliest infectious diseases, Nipah virus (40-75% case fatality), Lassa fever (300,000+ cases annually), Marburg virus (up to 88% mortality), MERS-CoV (35% case fatality) have zero approved monoclonal antibody therapeutics. For diseases like Oropouche fever, which caused explosive outbreaks across Latin America in 2024, there is no therapeutic pipeline of any kind.

Ainnocence has mapped 60+ infectious disease targets across all six continents where SentinusAI® can make an immediate impact. These span WHO Blueprint priority pathogens, neglected tropical diseases, and emerging outbreak threats. Ainnocence invities government, global health organizations, product development partnerships, and pharmaceutical collaborators worldwide to deploy its proprietary SentinusAI® antibody design platform against the infectious diseases where the therapeutic gap is widest and the human cost is greatest.

About Ainnocence Inc.
Founded in 2021 and headquartered in Mountain View, California, Ainnocence Inc. is a next-generation biotechnology company uses its proprietary generative AI platform to screen up to 10 billion molecules within hours to accelerate drug discovery across antibodies, small molecules, cell therapies, and synthetic biology. Working directly from sequence data, without 3D structural modeling; the platform has been applied across 60+ therapeutic programs. The company partners with leading pharmaceutical companies, academic institutions, and global health organizations to accelerate the discovery of life-saving biologics. For more information, visit www.ainnocence.com.

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