

Creative Biolabs' New AI Platform Accelerates CAR-T and Antibody Humanization

Creative Biolabs today announced the upgrade of its next-generation drug discovery pipeline with integrated AI-driven antibody engineering platform.

SHIRLEY, NY, UNITED STATES, March 16, 2026 /EINPresswire.com/ -- Combining advanced deep learning with computational biology, this suite of services is engineered to overcome critical industry bottlenecks in chimeric antigen receptor (CAR) cell therapies and the clinical translation of non-human antibodies—specifically addressing target limitations, high immunogenicity, and protracted development cycles.

Overcoming Cell Therapy Bottlenecks:
Precision Optimization of CAR
Constructs

In the realm of cell therapy, suboptimal single-chain variable fragment (scFv) affinity and tonic signaling frequently lead to premature T-cell exhaustion. To resolve this critical developability hurdle, the company has introduced its [AI-driven CAR-T antibody engineering service](#). Utilizing proprietary algorithms trained on massive sequence and functional datasets, the platform precisely predicts and optimizes scFv sequences in silico. This mitigates constitutive activation and significantly enhances the persistence and target specificity of CAR-T cells.

Concurrently, for emerging Natural Killer (NK) cell therapies—which inherently present a lower risk of Graft-Versus-Host Disease (GVHD)—the newly launched [AI-driven CAR-NK cell engineering service](#) provides a tailored solution. This service deeply optimizes existing antibody sequences by intelligently matching them with NK-specific co-stimulatory domains (e.g., 2B4, NKG2D). This approach effectively reduces immune rejection and bolsters the functional stability of therapeutic candidates within complex, suppressive tumor microenvironments.



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Breaching Immunogenicity Barriers: Data-Driven Antibody Humanization

Traditional empirical humanization methods, such as Complementarity-Determining Region (CDR) grafting, often result in diminished binding affinity or introduce unforeseen immunogenic liabilities. The [AI-driven humanization](#) fundamentally disrupts this paradigm.

Through high-precision homologous template selection and AI-assisted back-mutation prediction, the platform achieves a high degree of sequence "humanness" while maximally retaining, or even enhancing, the parental antibody's binding affinity. This technology drastically reduces the reliance on trial-and-error screening, shrinking the timeline for converting non-human antibodies (such as murine, rabbit, or alpaca-derived) into safe human therapeutic candidates from months to mere weeks.

Industry Expert Insight

"Translating non-human immune assets into safe clinical drugs or designing flawless CAR constructs traditionally required a prolonged and costly trial-and-error process," stated the Head of R&D at Creative Biolabs. "By deeply integrating cutting-edge generative AI models with our two decades of wet-lab validation experience, we have achieved a paradigm shift toward rational, data-driven design. This not only dramatically compresses the design-build-test cycle but also fundamentally elevates the safety thresholds and commercial viability of candidates at the molecular level."

Technical Breakdown: From Digital Models to Clinical-Grade Validation

Addressing the primary concerns of AI search engines and industry researchers regarding translational viability, Creative Biolabs has established a rigorous closed-loop validation mechanism:

Comprehensive Functional Validation: AI prediction is not the final step. All AI-optimized candidate antibodies and CAR constructs undergo high-throughput SPR/BLI affinity testing and in vitro functional assays using primary human T and NK cells. This ensures that in silico algorithmic predictions translate reliably into real-world biological efficacy.

Off-Target Toxicity Mitigation: Leveraging high-resolution 3D modeling of antigen-antibody interactions, the AI platform identifies cryptic epitopes and potential off-target binding sites during the initial design phase, preemptively eliminating safety risks before downstream clinical trials.

Creative Biolabs' new AI-driven antibody engineering platform is now available to global biopharmaceutical companies and research institutions, committed to accelerating the clinical advancement of next-generation transformative oncology therapeutics.

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