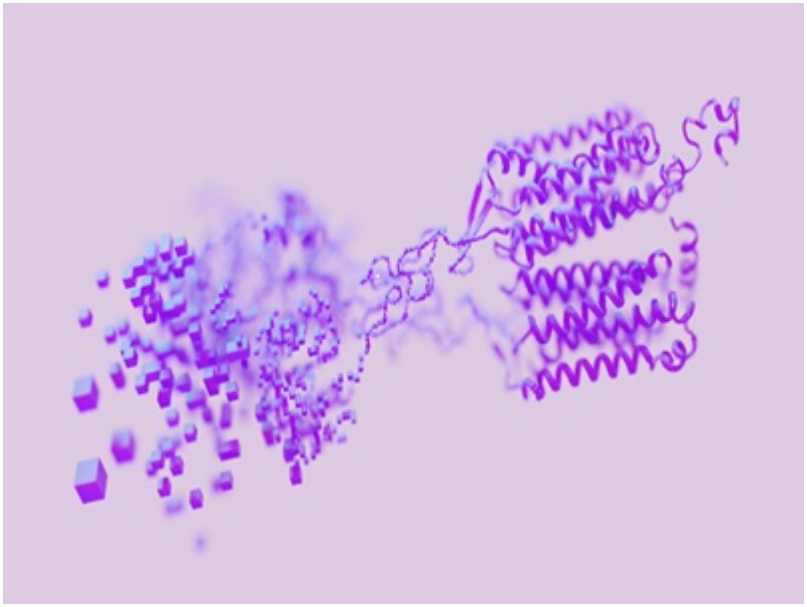
Custom-Designed Proteins for Precise DNA Sequence Recognition

A platform for designing synthetic proteins that bind specific DNA sequences with high precision, enabling new tools for gene regulation, diagnostics, and synthetic biology.



Technology ID

BDP 8885

Category

Selection of Available Technologies

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What is the Problem?

Current DNA-targeting tools, such as CRISPR systems or natural transcription factors, often face limitations in specificity, adaptability, and delivery. These tools may require complex engineering to retarget them to new DNA sequences and can sometimes interact with unintended sites in the genome. Current computational approaches for designing DNA-binding proteins have been limited to modifying the binding surfaces of existing native protein-DNA complex structures. There is a need for customizable, compact, and highly specific DNA-binding proteins that can be tailored to diverse applications in biotechnology and medicine.

What is the Solution?

This technology enables the de novo design of DNA-binding proteins using computational modeling. These synthetic proteins are engineered to recognize and bind specific DNA sequences with high accuracy. Unlike natural proteins, these designs are not constrained by evolutionary templates, allowing for greater flexibility in structure and function. The proteins

are small, stable, and experimentally validated to bind their target sequences with high specificity. This platform supports rapid development of new DNA-binding proteins for use in gene control, biosensing, and genome editing.

What is the Competitive Advantage?

-Customizable Targeting: Proteins can be designed to bind nearly any DNA sequence.

-Compact and Stable: Small size improves delivery and stability in biological systems.

-High Specificity: Strong binding to target sequences with minimal off-target effects.

-Scalable Design Process: Computational pipeline allows for rapid prototyping and testing.

Patent Information:

US20250051407A1

References

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