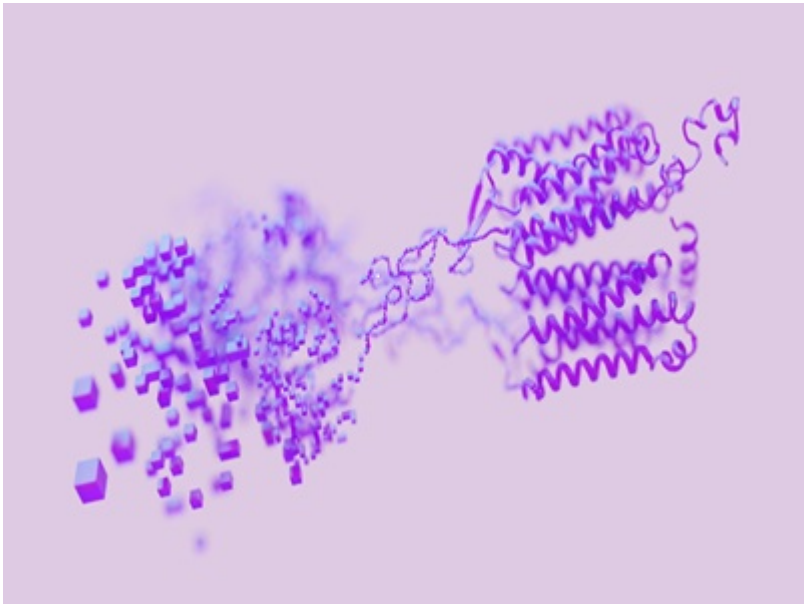
Reconfigurable Asymmetric Protein Assemblies

This technology leverages the principles of implicit negative design to create reconfigurable asymmetric protein assemblies, offering a new paradigm in protein design.



Technology ID

BDP 8457

Category

Selection of Available Technologies

Authors

David Baker

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What is the Problem?

In the field of synthetic biology, creating stable and soluble monomeric proteins that reversibly associate into hetero-oligomers remains a significant challenge. These proteins should ideally be folded and soluble when isolated, yet rapidly and specifically associate when mixed. Creating proteins that can reconfigure themselves into different structures is difficult because the designed interfaces, which are largely nonpolar, can drive not only the association between two different chains but also the self-association of individual chains. This limitation hinders the development of proteins with diverse functionalities and applications.

What is the Solution?

The technology is the design of modular reconfigurable asymmetric protein assemblies. It uses the principles of implicit negative design to generate beta sheet mediated heterodimers. These heterodimers are stable, folded, and monomeric in isolation but rapidly assemble upon mixing. The technology enables the assembly of a wide variety of structurally well-defined asymmetric

assemblies, including linearly arranged hetero-oligomers with up to 6 unique components, branched hetero-oligomers, closed C4-symmetric two-component rings, and hetero-oligomers assembled on a cyclic homo-oligomeric central hub.

What is the Competitive Advantage?

This technology offers a unique approach to protein design, allowing for the creation of proteins with diverse structures and functionalities. Unlike existing solutions, it enables the design of proteins that can reconfigure themselves into different structures, offering greater flexibility and potential applications. The technology also provides methods for the use and design of polypeptides and fusion proteins capable of heterodimer formation, further expanding its potential applications in various fields, including bioengineering and medicine.

Patent Information:

WO2023288190A1

References

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