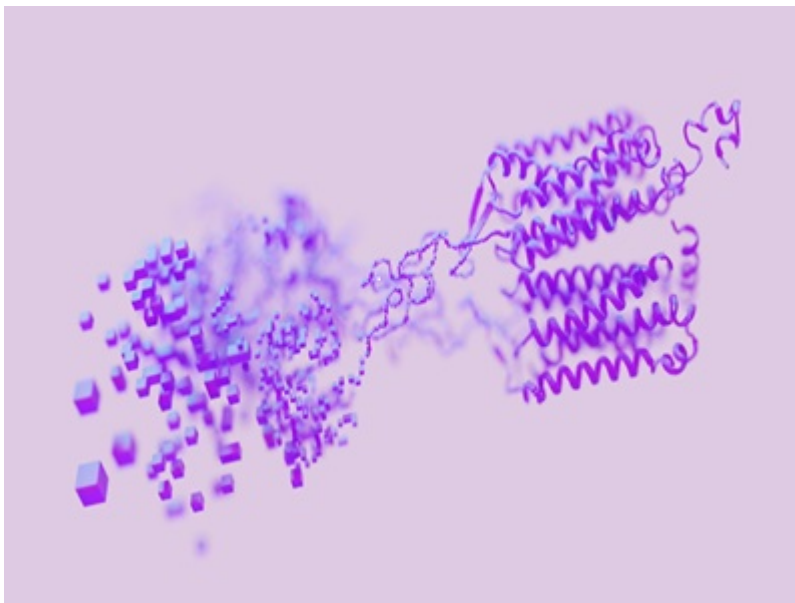


De Novo Design of ABC Heterotrimeric Proteins

The technology is a novel method for designing ABC heterotrimeric proteins de novo, offering potential applications in biotechnology and medicine.



What is the Problem?

The design of proteins with desired functions is a long-standing goal in synthetic biology. However, creating proteins that can form specific, stable structures remains a significant challenge. This complexity is increased when dealing with heterotrimeric proteins, which are composed of three different chains. These proteins have a wide range of functions in nature, but creating them in the lab has been a significant challenge due to the difficulty of ensuring the correct assembly of the three distinct chains.

What is the Solution?

The solution is a method for designing three protein chains that associate to form an obligate 'ABC' heterotrimer. This is achieved by leveraging the properties of coiled coils and hydrogen bonds. The design process involves a strategic search for buried hydrogen bond networks that can accommodate nonpolar aromatic residues, enhancing the core packing to create de novo ABC heterotrimeric coiled coils and helical bundles.

Technology ID

BDP 8593

Category

Selection of Available
Technologies

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What is the Competitive Advantage?

The technology provides a new method for designing ABC heterotrimeric proteins with specific, stable structures, overcoming a significant challenge in the synthetic biology field. The technology is based on a novel approach that leverages the properties of coiled coils and hydrogen bonds, offering a unique advantage over existing methods. The designed proteins have the potential to be used in a variety of applications, from drug delivery to materials science. The capability to design protein assemblies with three-way junctions opens new avenues for modulating cell signaling and designing more intricate protein nanostructures.

Patent Information:

[US20240029824A1](#)

References

1. Bermeo, S., Favor, A., Chang, Y. T., Norris, A., Boyken, S. E., Hsia, Y., Haddox, H. K., Xu, C., Brunette, T. J., Wysocki, V. H., Bhabha, G., Ekiert, D. C., Baker, D.(2022) , <https://www.nature.com/articles/s41594-022-00879-4>, <https://www.nature.com/nsmb/>, 29, 1266-1276