Axle-Rotor Protein Assemblies: A New Frontier in Protein Nanomachines

This technology offers the design of innovative protein nanomachines, featuring unique axle and rotor components. These assemblies have potential applications in various fields, including nanotechnology and biomedicine.

What is the Problem?

Protein nanomachines are crucial for various biological processes and have immense potential in fields like nanotechnology and medicine. However, the design of dynamic protein mechanical systems is a challenging task due to the complex folding and diverse non-covalent interactions involved. Current methods struggle to create systems with internal degrees of freedom, limiting their functionality and potential applications.

What is the Solution?

The technology involves the de novo computational design of protein machinery, specifically axle and rotor components. These components assemble as designed both in vitro and in vivo, creating mechanically constrained nanoscale protein architectures. The technology addresses the need for more versatile and functional protein nanomachines in the market.

What is the Competitive Advantage?

Unlike existing solutions, this technology allows for the design of protein assemblies with internal cyclic or dihedral symmetry, adding an extra layer of functionality. The assemblies are designed de novo, allowing for greater control over their properties and potential applications. This technology enables the ability to create protein nanomachines with internal degrees of freedom, a feature not commonly found in current alternatives. These protein nanomachines can be engineered for a range of applications in medicine, material sciences, or industrial bioprocesses.

Patent Information:

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References

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Selection of Available Technologies

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