

Secretion-Optimized Protein Nanoparticles for Eukaryotic Expression and Genetic Delivery

This technology offers innovative protein nanoparticles designed for efficient secretion in eukaryotic cells, enhancing genetic delivery and therapeutic applications.

What is the Problem?

Efficient secretion of protein nanoparticles from eukaryotic cells is a significant challenge in biotechnology. Hydrophobic interfaces are essential for protein nanoparticle assembly, but often form cryptic transmembrane domains that can embed in cell membranes and thus hinder their secretion. As a result, many designed protein assemblies fail to secrete effectively, limiting their potential in therapeutic and genetic delivery applications. Understanding and controlling the secretion of protein nanoparticles is crucial to optimize the development of secreted protein technologies.

What is the Solution?

The technology uses a novel approach to optimize the secretion of de novo designed protein nanoparticles. By using a computational protocol called the Degreaser, cryptic transmembrane domains are identified and redesigned without compromising protein stability. This method significantly improves the secretion efficiency of protein nanoparticles, making them more viable for use in various biotechnology applications, including vaccines and therapeutics. This technology represents a significant advancement in the field of protein engineering, providing a robust solution to a common bottleneck in the production of therapeutic proteins.

What is the Competitive Advantage?

Enhanced Secretion Efficiency: The Degreaser protocol ensures that protein nanoparticles are secreted as efficiently as naturally occurring proteins.

Versatility: This technology can be applied to a wide range of protein assemblies, making it broadly useful in different biotechnology fields.

Stability: The redesign process maintains the stability and functionality of the protein nanoparticles, ensuring their effectiveness in therapeutic applications.

Technology ID

BDP 8567

Category

Research Tools
Therapeutics/Infection
Therapeutics/Platform
Technology
Selection of Available
Technologies

Authors

Neil King

Learn more



Market Potential: The improved secretion of protein nanoparticles opens up new possibilities for genetic delivery systems and the development of advanced biologics.

Patent Information:

[WO2023196871A2](#)

References

1. Wang, J. Y. J., Khmelinskaia, A., Sheffler, W., Miranda, M. C., Antanasijevic, A., Borst, A. J., Torres, S. V., Shu, C., Hsia, Y., Nattermann, U., Ellis, D., Walkey, C., Ahlrichs, M., Chan, S., Kang, A., Nguyen, H., Sydeman, C., Sankaran, B., Wu, M., Bera, A. K., Carter L., Fiala B., Murphy M., Baker D., Ward A. B., King N. P.(2023) , <https://pmc.ncbi.nlm.nih.gov/articles/PMC10089191/>, <https://www.pnas.org/>, 120, e2214556120