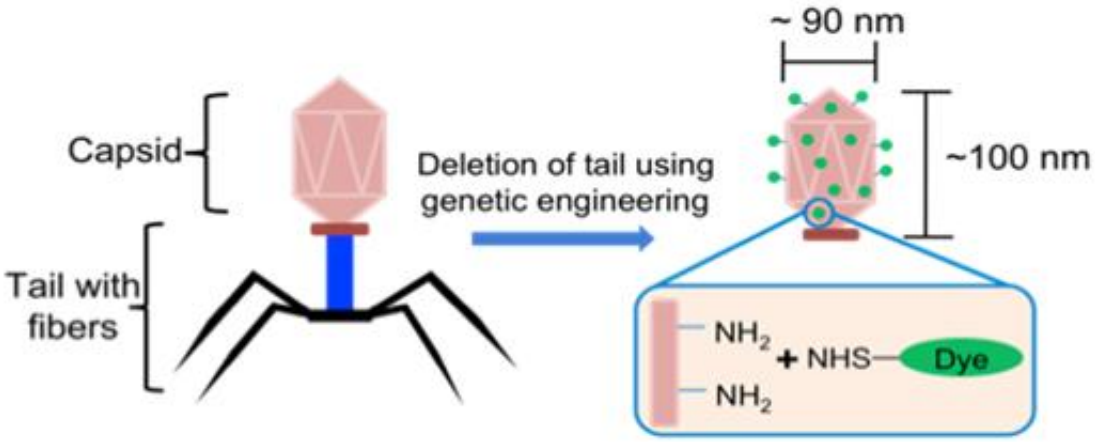
NAVAL RESEARCH LABORATORY

TECHNOLOGY LICENSING OPPORTUNITY

DYE AND DRUG DELIVERY WITH PHAGE-LIKE NANOPARTICLES



The Naval Research Laboratory (NRL) has developed phage-like nanoparticles for the delivery of payloads to targeted eukaryotic cells. The nanoparticles are designed with reactive surface groups that can bind a dye, drug, antibody, etc. The modified nanoparticles can be used for cell tracking, cell imaging, and drug delivery. They are produced from *E. coli* as tailless T4 bacteriophage and modified to deliver content into targeted eukaryotic cells. In testing conditions, the nanoparticles can retain their shape in the absence of DNA. The tailless bacteriophage is non-contagious, non-toxic, and biodegradable. These features enable it to be used for *in vitro* diagnostics and potentially for *in vivo* applications. Dyes delivered by the nanoparticles can aid in intracellular imaging and cell tracking. Because of their size, these nanoparticles have the advantage of being able to deliver a substantial amount of treatment directly to a specified cell, such as a tumor cell. Studies have confirmed that the nanoparticles are non-toxic to human umbilical endothial cells, astrocytes, and liver cells. The nanoparticles have been shown to effectively deliver fluorescent dyes, such as Cy3 and AlexaFluor546. These phage-like nanoparticles have great potential for use in biomedical applications.

References

"Engineered T4 Viral Nanoparticles for Cellular Imaging and Flow Cytometry," *Bioconjugate Chemistry*, 2001, 22, p. 595-604.

Available for License: Patent applications have been filed.

Advantages/Features

Recovers from *E. coli* with >90% purity

Uses commercially available equipment and techniques for large-scale production

Accommodates 1.9 x 10^4 dyes per nanoparticle, better than TMV or PVX

Delivers effective fluorescence *in vitro* with as few as 350 dyes per particle

Accumulates in cells for at least 72 hours

Applications

Drug delivery vehicle

Cellular imaging *in vitro* and *in vivo*

Cell tracking in co-cultures

Fluorescence-activated cell sorting (FACS)

Other flow cytometry applications

For more information contact:

Rita Manak, Ph.D.
Head, Technology Transfer Office

202 767-3083

rita.manak@nrl.navy.mil

Identification Number:

BIO10