INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Biodegradable protein based Nanoparticles for drug delivery

TECHNOLOGY NUMBER: 2020-143

OVERVIEW

Improved method for nanoparticle-based drug delivery systems

- Creates biodegradable Ovalbumin (OVA) protein nanoparticles
- Allows for a wide variety of molecule carrying and delivery

BACKGROUND

Nanoparticle-based drug delivery systems show advantages compared to their free drug counterparts including protection of loaded cargo from degradation or deactivation, controlled release mechanisms, and altered pharmacokinetics which permit specific control of biodistribution. However, nanoparticle use may be limited because of their rapid clearance from the circulation, inefficient delivery to target tissues, and a limited ability to cross anatomic blocks such as the blood brain barrier. The promise for nanoparticle-based therapeutics can only be met once these limitations are addressed.

INNOVATION

Researchers have prepared biodegradable Ovalbumin (OVA) protein nanoparticles comprised of at least one therapeutically active protein with a synthetic polymer crosslinker. The fabrication method involves cross-linking water-soluble proteins that yields structures with novel architecture. The process creates a mesh framework comprised of large, open pores within which therapeutic molecules can be loaded. The categories of molecules that can be loaded include therapeutics, biomolecules, enzymes, small molecules, and imaging agents. The release profile which facilitates delivery of these agents can be influenced by adjusting the size of the pores in the mesh. Animal studies have shown that OVA protein nanoparticles can improve the

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Category

Therapeutics and Vaccines
Life Sciences

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overall anti-tumor response compared to free protein in mice with brain tumors.