

Method of Transdermal Drug Delivery Using Hyaluronic Acid Nanoparticles

Researchers at the University of South Florida have developed a hyaluronic acid and hyaluronic acid hybrid nanoparticle drug delivery system for the administration of active molecules, peptides, DNA and/or other hydrophilic or hydrophobic molecules.

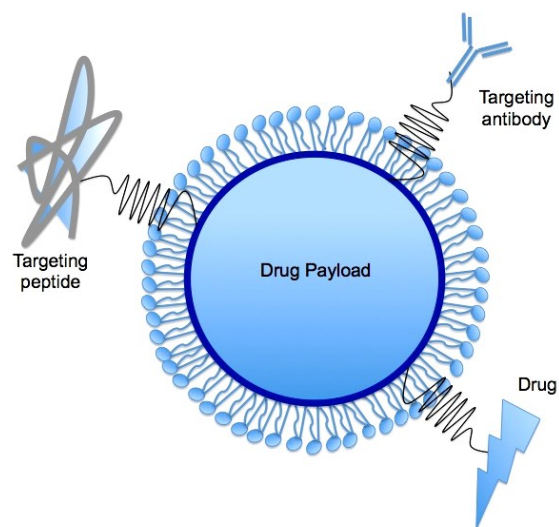
Hyaluronic acid is a non-immunogenic polysaccharide found on mammalian cell surfaces and is commonly used in transdermal drug delivery efforts. It is also the main component of the extracellular matrix, and plays an important role in the mechanical support of the cell and many tissues including skin, tendons, muscles and cartilage. Like other nanoparticles, hyaluronic acid delivery systems are very versatile and can carry genes, drugs and proteins to cells. While hyaluronic acid and its salts are currently being used in various therapeutic efforts, many modifications required for its use have decreased the chemicals' solubility in water and have limited its usefulness. Thus, hyaluronic acid nanoparticles need to be further developed for a more successful drug delivery system.

USF researchers have developed novel hyaluronic acid and hyaluronic acid hybrid nanoparticles for transdermal drug delivery. These nanoparticles can encapsulate peptides, DNA, and small molecules. They also allow for the controlled release of the active molecules that they are transporting. The nanoparticles are at most 180 nm in diameter, making them an attractive candidate for cell specific drug delivery. These nanoparticles are made from natural polymers, are biocompatible and biodegradable, and are well suited for gene or chemotherapy treatment.

ADVANTAGES:

- **A controlled drug delivery release**
- **Produced from natural polymers**
- **Biocompatible and biodegradable**
- **Encapsulates DNA, peptides and other small molecules**

Nanoparticles for Drug Delivery with Controlled Release of Active Molecules



An Example of a Solid Lipid Nanoparticle Used for Drug Delivery

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