URVentures

Needle-Free Drug/Vaccine Delivery System

A novel peptide-based strategy for controlled transepithelial delivery of therapeutic molecules.

Problem Solved by this Technology

Transdermal drug delivery systems (TDDS) are increasingly becoming an attractive alternative to the oral route as this method can avoid first pass effects, can provide steady drug plasma levels and is poised to replace painful hypodermic injections. Intact skin acts as a natural barrier and can impede transdermal delivery of therapeutic agents. Existing TDDS deliver only small molecule drugs and cannot be used for larger therapeutic agents such as antibodies and vaccines. Researchers at the University of Rochester have circumvented this problem by using an alternative strategy. Through temporary disruption of the network of proteins responsible for maintaining skin barrier, this new TDDS enables paracellular delivery of both small molecule drugs and large biologics, such as vaccines.

Applications of this Technology

Our researchers invented synthetic peptides that enable transient and controlled disruption of the skin barrier to allow the efficient delivery of both small and big biologic molecules to the body. They have demonstrated that this process works in human epithelial cell model systems *in vitro*, and have solid data showing peptide-dependent transepithelial passage of molecules with sizes up to and including therapeutic monoclonal antibodies (molecules averaging 10 x 10-15 x 2.5 nm in size).

More importantly, this TDDS is superior to micro-needle supported delivery approaches in that there is no concern about needle disposal. This can be especially beneficial for vaccinations needed for massive populations or in remote areas.

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Intellectual Property Status

U.S. and international patent applications pending.

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