Cell Penetrating Peptides in the Delivery of Biopharmaceuticals

Abstract

The cell membrane is a highly selective barrier. This limits the cellular uptake of molecules including DNA, oligonucleotides, peptides and proteins used as therapeutic agents. Different approaches have been employed to increase the membrane permeability and intracellular delivery of these therapeutic molecules. One such approach is the use of Cell Penetrating Peptides (CPPs). CPPs represent a new and innovative concept, which bypasses the problem of bioavailability of drugs. The success of CPPs lies in their ability to unlock intracellular and even intranuclear targets for the delivery of agents ranging from peptides to antibodies and drug-loaded nanoparticles. This review highlights the development of cell penetrating peptides for cell-specific delivery strategies involving biomolecules that can be triggered spatially and temporally within a cell transport pathway by change in physiological conditions. The review also discusses conjugations of therapeutic agents to CPPs for enhanced intracellular delivery and bioavailability that are at the clinical stage of development.

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