

CELL-PENETRATING PEPTIDES

Patient need addressed

Cancer

The Solution

The present invention relates to the development of innovative cell-penetrating peptides (CPPs) to deliver cargos inside cells with very high efficiency and without noticeable toxicity.

CPPs are most promising alternatives for delivering cargos into cells, however, despite several decades of investigation, the fundamental basis for CPPs activity remains elusive. Consequently, CPPs developed so far do not usually achieve a high efficiency in cargo delivery and are frequently cytotoxic for cells.

Innovative Aspects

The new cell-penetrating peptides (CPPs) comprise a specific short amino acid sequence of the CD300f protein that show a strong binding capacity to phospholipids, the main component of the plasma membrane. Through amino acid substitutions, the inventors found the key amino acids that mediate the binding of this sequence being, in particular, one lysine residue and some tryptophan residues located in very specific and unique positions.

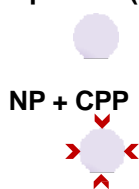
The peptides or proteins comprising the identified sequence show a potent cell-penetration activity, thereby facilitating the internalization of cargos to which they are conjugated (peptide-cargo conjugate).

Diverse types of nanoparticles (as micelles or extracellular vesicles) conjugated to these new peptides present higher delivery rates than nanoparticles conjugated to TAT (tyrosine aminotransferase), the gold standard of CPPs.

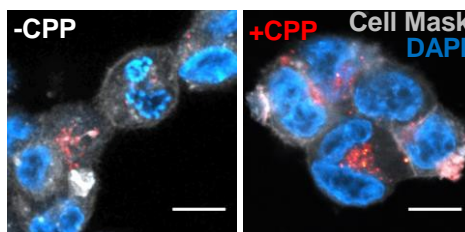
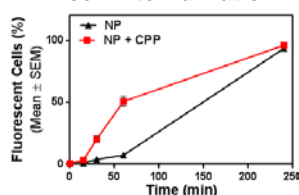
The technology provides a pharmaceutical composition comprising a therapeutically effective amount of a conjugate with at least one pharmaceutically acceptable excipient, diluent or carrier.

Both the conjugate and the pharmaceutical composition can be used as a medicament.

Nanoparticle (NP)



NP cell internalization



Stage of Development: *In vitro* validation ready for *in vivo* studies and clinical proof of concept

Intellectual Property

European patent application (Priority date: November 10, 2020)

International patent application: WO2022/101193A1

Available for
Licensing or Assignment



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