

Title: Wheat-derived Cell Penetrating Peptide for Plant and Mammalian Cells

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KEYWORDS: γ -wheat Thionin, Plant cell, Mammalian cell, Antimicrobial, protein, Cell wall

DOMAIN: Healthcare (drug delivery)

SUMMARY:

The synthetic peptide is derived from chain A of γ -wheat thionin, it possesses excellent antimicrobial properties and cell-penetrating capabilities. It delivers various cargo molecules across both animal and plant cells. The existing drug delivery vehicles often face difficulties related to the penetration of peptides across plant cells due to the presence of additional cell walls. Also, the transduction methods are labor-intensive and time-consuming, resulting in physical damage to cells and broken transgenes. The newly developed peptide is a promising and safe alternative for cargo delivery. It forms a stable non-covalent complex with cargo molecules, facilitating efficient transduction of cargo molecules into the cells in active form. It can deliver proteins, enzymes, oligonucleotides, drugs, etc.

ADVANTAGES:

1. Potential to penetrate across both the mammalian and plant cells.
2. The peptide has intrinsic anti-fungal and anti-bacterial properties.
3. Cargo molecules are delivered at target sites in biologically active form.
4. Peptides can transport macromolecule proteins across the cell inflicting minimal toxicity to the host cell.

APPLICATION: Drug delivery vehicles across the plant and mammalian cells.

SCALE OF DEVELOPMENT: Lab-scale experiments were performed on the Human HeLa (Henrietta Lacks) cell line and Plant tissue.

TECHNOLOGY READINESS LEVEL: TRL 3

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