

CLAIMS

1. An isolated, non-naturally occurring cell-penetrating peptide (CPP) having up to 30 amino acid residues and comprising the amino acid sequence of SEQ ID NO: 1:

RRSRTARAGRPGRNSSRPSAPR [SEQ ID NO: 1] with up to two amino acid substitutions;

wherein each amino acid in the peptide may be present as a D-amino acid or an L-amino acid.

2. The isolated, non-naturally occurring CPP of claim 1 wherein SEQ ID NO:1 has mixed L and D amino acids.
3. The isolated, non-naturally occurring CPP of claim 1 that has at least 99% similarity to SEQ ID NO: 1.
4. The isolated, non-naturally occurring CPP of any one of claims 1-3, wherein the CPP comprises the sequence:

rrsrtaraGrpGrnssrpsapr

wherein the lower-case letters denote a D-amino acid.

5. A modified CPP, comprising the CPP of any one of claims 1-4 covalently bound to an oligonucleotide. 1.
6. The modified CPP of claim 5, wherein the oligonucleotide is an antisense oligonucleotide.
7. The isolated, non-naturally occurring CPP of any one of claims 1-4; or the modified CPP of claim 5, wherein the amino acid sequence has 20 to 40 amino acid residues.
8. A modified CPP comprising the isolated, naturally occurring CPP of any one of claims 1-4 conjugated to a molecule chosen from the group consisting of: a therapeutic agent, an oligonucleotide, a further peptide or protein, a reactive group, a fatty acid, cholesterol, or a detectable label.
9. The modified CPP of claim 8 wherein the conjugation is covalent or non-covalent.
10. A modified cell comprising the isolated, naturally occurring CPP of any one of claims 1-4; or the modified CPP of any one of claims 5-9.

11. The modified cell of claim 10, wherein the modified cell is a retinal pigment epithelial cell.
12. Use of the isolated, non-naturally occurring CPP of any one of claims 1-4; or the modified CPP of any one of claims 5-9; or the modified cell of claim 10 or claim 11 in the manufacture of a medicament or diagnostic agent.
13. A kit comprising (i) the isolated, non-naturally occurring CPP of any one of claims 1-4, the modified CPP of any one of claims 5-9; or the modified cell of claim 10 or claim 11; and (ii) instructions for use.
14. A non-naturally occurring cell-penetrating peptide (CPP) having 20 to 40 amino acid residues and comprising an amino acid sequence having at least 90% similarity to SEQ ID NO: 1:

RRSRTARAGRPGRNSSRPSAPR [SEQ ID NO: 1]

wherein each amino acid in the peptide may be present as a D-amino acid or an L-amino acid.