Lipid-Sensitive Endosomolytic Peptide for Cytosolic Antibody Delivery

We are looking to out-license the technology for its commercialization.

Novel peptides that achieve efficient delivery of high-molecular-weight antibodies/proteins into cytoplasm

◆Background

One of the major obstacles to intracellular targeting by antibodies is their limited release from endosomes into the cytosol. Antibodies are taken up by cells via endoytosis, which is involves the physiological uptake of extracellular materials delivered into cells by encapsulation into vesicular compartments named endosomes. Without their release from vesicular compartments into the cytosol, antibodies cannot interact with their target molecules, and may eventually be degraded in these compartments.

◆Description

Researchers at Kyoto University have developed endosomolytic peptides that effectively deliver biomacromolecules, including antibodies, into the cytosol. The endosomolytic peptides are derived from the cationic and membrane-lytic spider venom peptide M-lycotoxin. By replacing leucine residue with glutamic acid (L17E) the delivery peptide specifically interacts with endosome membranes, breaking them down and releasing the antibodies.

- **Facilitates the cytosolic release of endocytosed biomacromolecules**
  The effective release of antibodies (~150 kDa; Fig.2) and of small protein (Flg.3) into cytoplasm are verified.
- **Stimulates the physiological uptake of the cargo via the induction of micropinocytosis**
- **Allows antibodies to interact with target proteins, modulating their functions in cells**
- **L17E does not have a significant pH dependent membrane lytic activity**

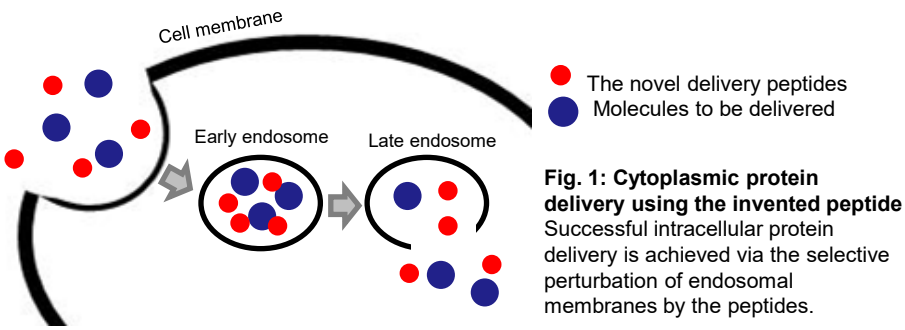

Fig. 1: Cytoplasmic protein delivery using the invented peptide
Successful intracellular protein delivery is achieved via the selective perturbation of endosomal membranes by the peptides.

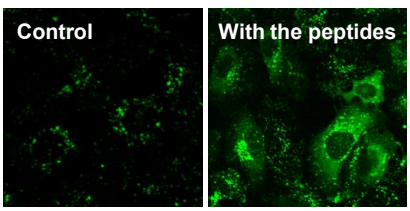

Fig. 2: Delivery of antibodies(~150 kDa)
Antibody delivery into HeLa cells observed with confocal microscope.

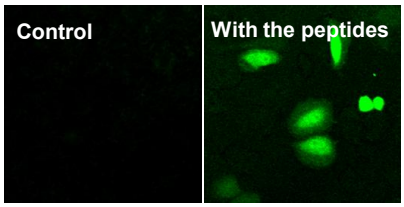

Fig. 3: Introduction of exogenous Cre recombinase (38 kDa) for gene recombination
Fluorescent signals ensure successful gene recombination by Cre.

◆Development Status

- Release of antibodies (150 kDa) into cytoplasm verified
- Release of small proteins into cytoplasm verified

◆Applications

- Protein/antibody delivery
- Reagent for bioimaging/cell activity measurement
- Research tool for development of therapeutic antibodies /biopharmaceuticals

◆Offer

- License (Non-exclusive)
- MTA for sample evaluation

※Patent Pending
(Applicant: Kyoto University)

◆Contact

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