

JW CreaGene Corp.



Technology Overview

1. Background of Technology

Cell Penetrating Peptides (CPP) have ability to overcome the plasma membrane barrier of mammalian cells for the transcellular delivery of cargos such as oligonucleotides, proteins, drugs.

Peptide transduction domain (PTD), best-known CPP, contains NLS (nuclear localization sequence) which imports proteins into the nucleus. However, PTD has a few drawbacks as well as good transduction efficiency. The mobility of PTD-conjugated molecules into nucleus may be toxic to genome of the cell. In case to target proteins or therapeutic drugs to the cytoplasm, the direction of PTD for nucleus reduces their function.

To overcome such a shortcoming, CTP (Cytoplasmic Transduction Peptide) technology was developed through a series of novel peptides by removing the NLS function from the PTD. CTP has not only excellent transduction efficiency, but also a strong tendency to remain in the cytoplasm after transduction without migrating into the nucleus. When cells are treated with CTP-conjugated proteins, they immediately penetrate into cells in 5 minutes. CTP is characterized by a genuine cytoplasmic retention, remaining in the cytoplasm for a period of time.



Cytoplasmic localization after CTP-mediated transduction compared with PTD, Exp Cell Res. (2006) 12 : 1277 -88 (left), monocyte-derived immature DC was treated with CTP-conjugated antigens (right).

2. Description on Technology Applied

(A) Summary of CTP

① Newly developed by JW Creagene through analysis and remodeling of PTD.



- ② Efficiently deliver macromolecular substances into cells at 2~5 times better compared to PTD.
- ③ Only remain in cytoplasm, minimizing the genetic damage of conjugated substance

(B) Application

1) Drug Delivery System

CTP technology can efficiently deliver high polymer materials to the cytoplasm. Thus, as Drug Delivery System (DDS), CTP is very useful in cases where drugs must have biological activity in the cytoplasm.

Through improved cell membrane permeability, CTP-conjugated drugs can show effective results in low densities. Particularly, if a drug being used could cause genetic damage, CTP technology can be very useful as it prevents nuclear movement.

2) Antigen delivery into Dendritic cell

Upon production of dendritic cells, the cancer specific antigens are combined with the CTP, and CTP-cancer antigens can induce strong cancer specific immunity. Consequently, a high antigen sensitization effect and the induction of immunity responses on various targets can be expected.

2. Differential Point, Superiority or Characteristics of Technology Applied

Antigen delivery is essential step for antigen presentation on DC and it is important to generate optimized functional DC vaccine. To sensitize dendritic cells with disease specific antigens, the CTP technology was developed with following advantages;

(A) High permeability; an efficient intracellular delivery of polymer materials compared to PTD

(B) Cytoplasmic retention; CTP is selectively retained in cytoplasm, and prevent polymer materials from damaging against cellular genetic substance.

No.	Name of Patent	Application No.	Date of application /approval	Country	Status (Applied/approval)	Cost for patent (thousand, KRW)
1	Cytoplasmic Transduction Peptides and Uses thereof	2002-0017546 2004-7014038 0608668	appl:02.03.29 appl:04.09.29 appr:06.07.27	Korea	applied applied approval	1,338

3. Specific Patent



	PCT/KR03/00630	appl:03.03.28	PCT	applied	1,793
	US 10/509,620 7,101,844	appl:04.09.29 appr:06.09.05	USA	applied approval	844
	2004-506345 4188909	appl:04.09.28 appr:08.09.19	Japan	applied approval	221
	03 713 056.4	appl:03.03.28	EU	applied	3,413

※ Please provide accurate information for Application No and Date of application/approval. It will be used for patent search.

X In case of Cost for patent, please consider administrative cost for patent application only.

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