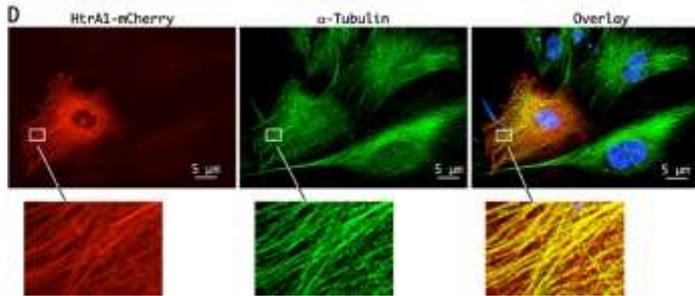


Protein delivery into cells by HTRA1

Internalisation of human HTRA1 and cargo proteins into mammalian cells

Invention

Precise and graded manipulation of protein levels in mammalian cells is an essential experimental tool in both basic research and clinical applications. There are currently several methods in use that aim at delivery of proteins into cells to manipulate e.g. signal transduction or other specific cell



Regulation and cellular localization of HTRA1, taken from figure 3 of Tennstaedt A, et al. (2012)

functions. These methods range from chemical transfectants to penetrating peptides and viral transporters, which either directly change the protein level or indirectly influence the respective gene expression. However, the common drawbacks of all of the currently available methods are a low efficacy, a weak tunability and a high death rate of the target cell population. The present invention solves these problems by means of the High Temperature Requirement A1 (HTRA1) protein, which is a serine protease that is initially secreted. Secreted HTRA1 is also taken up by cells. It has been shown that HTRA1 serves as a carrier to deliver cargo into cells without using transfection reagents. Moreover, due to its C-terminal PDZ domain, HTRA1 has various intracellular localizations such as the cytoplasm, microtubules or in the nucleus, and may thus serve in the distinct subcellular delivery of proteins.

Commercial Opportunities

HTRA1 or variants with an altered or different PDZ domain or designed hybrid proteins composed of carrier and cargo allows delivery of different cargo proteins and potentially distinct compartmental distribution within the target cells. Therefore, HTRA1 provides a new, improved tool for reagent-free transfection.

Current Status

On behalf of the University of Duisburg-Essen, PROvendis offers the invention for licensing and research collaboration to interested companies. In case of interest we will be pleased to inform you about the patent status.

Relevant Publications

Campioni M, et al. (2010) The serine protease HtrA1 specifically interacts and degrades the tuberous sclerosis complex 2 protein. *Mol. Cancer Res.* 8: 1248-60.

Pöpsel, S, et al. (2015) Determinants of amyloid fibril degradation by the PDZ protease HTRA1. *Nat. Chem. Biol.* 11: 862-69.

An invention of the University of Duisburg-Essen.

Competitive Advantages

- Transfection reagent-free manipulation of cells
- High efficacy of a tuneable and homogeneous transfection
- Low death rate of target cells

Technology Readiness Level

123456789

Experimental proof of concept

Industries

- Pharmaceutical Industry

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