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Materials and Methods Analyzing Cellular Entrance Pathways

A novel multifunctional reagent and mass spectrometry technique reveals detailed, time-resolved information on cellular transport proteins, enabling the design of more effective and targeted drugs.

Understanding how drugs and viruses enter cells is paramount for better drug efficacy and for designing more targeted drugs to combat infection. Currently, traditional molecular biology techniques are used to understand the passage of a molecule from the outside of the cell to the cytoplasm. While these techniques offer a great starting point to understanding key proteins involved in transport, they only provide a snapshot of a specific interaction and miss other biomolecules that are involved in intermediate steps.

Purdue University researchers have developed a multifunctional reagent to study cellular transport of molecules. The novel reagent will interact with multiple proteins necessary for transport into the cell and the resulting conjugates identified by mass spectrometry. At varying times, cellular proteins can be isolated to identify the proteins the reagent is bound to, giving investigators a better understanding of what is involved in cellular transport.

Advantages:

-Information to design more efficacious drugs

-Learn more detailed information about cellular transport

-Design more targeted drugs to treat infection

Potential Applications:

-Bioinformatics

-Pharmaceuticals

-Chemical analysis

Technology ID

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Category

Biotechnology & Life Sciences/Bioinformatics & Computational Biology

Pharmaceuticals/Research Tools & Assays

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-Drug development

Related Publications:

Wang, Linna, et al. Time-Resolved Proteomic Visualization of Dendrimer Cellular Entry and Trafficking. Journal of the American Chemical Society. 2015, 137 (40), pp 12772â€“12775.

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Intellectual Property:

Provisional-Patent, 2012-05-18, United States | PCT-Patent, 2013-03-13, WO | NATL-Patent, 2014-09-22, United States

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