Enhancing Cell Penetration to Improve Drug Delivery

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Technology description

The utility of many biologic drugs is limited by inefficient cellular delivery. There is a particular need for methods and reagents that facilitate delivery of peptides and proteins into the interior fluid (cytosol) of cells. The vast majority (>90 percent) of biologics that enter a cell’ s endosomes fail to reach the cytosol, where they can be of greater value.

Until now, there have been few methods for modifying a peptide or protein (that does not naturally enter a cell) to enhance its uptake into the cytosol in a bioreversible manner. Being able to do so has implications for biological research as well as the clinic. For example, dysfunctional proteins could be replaced with functional ones, and misbehaving proteins could be antagonized with specific antibodies. UW–Madison researchers have developed a method for enhancing cellular uptake of a cargo molecule by covalently bonding fluorenyl groups to it. The fluorenylated molecule is then contacted with the cell or tissue. Cellular uptake may bein vivoorin vitroand includes at least partial penetration into the cytosol.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods to enhance cellular uptake of fluorenylated proteins, peptides and other cargo molecules.

Application area

Enhanced cellular delivery/penetration of drugs, proteins, nucleic acids and other molecules

Advantages

First bioreversible method of its kind
Increased cytosolic uptake

Institution

Wisconsin Alumni Research Foundation

Inventors

Kristen Andersen

Ronald Raines