Guided Injection of Charged Cargo for Intracellular Delivery

A system and method for precise delivery of cellular subcomponents with improved control and delivery.

Georgia Tech inventors have created a system and method for precise delivery of cargos, including DNA, RNA, proteins, peptide, organelles, functionalized nanoparticles, virus, CRISPR, and exosomes. Through an in vitro or in vivo delivery to a system, the method focuses on a network of individual cells or a multicellular tissue construct, which is stabilized on the substrate or flowing through open channels in a microfluidic system. This technology creates possibilities to apply and locally control the injection of the solubilized cargo into cells/tissue of the substrate or channel and is suitable for multiplexed, parallel processing.

Summary Bullets

- **Novelty** – use of an electrically-charged liquid beam of electrospray
- **Improved control** – control of action on the scale of single cell/single pores
- **Diversity** – arbitrary diverse set of cargo

Solution Advantages

- **Novelty** – use of an electrically-charged liquid beam of electrospray
- **Improved control** – control of action on the scale of single cell/single pores
- **Diversity** – arbitrary diverse set of cargo
- **Applications** – suitable for both in vivo and in vitro applications
- **Improved delivery** – selective and direct delivery of charged cargo

Potential Commercial Applications

Laboratory and clinical applications

- Gene and drug delivery
- Therapeutic cell modification
- CRISPR delivery
- Cell imaging
- Bioprocessing
- Biologics production

Background and More Information

The ability to inject DNA into cells is critical to any genetic, molecular, biology, drug design and delivery, and pharmaceutical research and development work. There is a need for unprecedented control of action on the scale of single cell/single pore, and the ability to deliver a diverse set of cellular subcomponents to a biological system.

Inventors

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IP Status

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Publications

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