Guided Injection of Charged Cargo for Intracellular Delivery (#8275)

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.

Benefits/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/Context for This Invention

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.

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Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/guided-injection-charged-cargo-intracellular-delivery