



Inventors

Dr. Alexandra Ros

Associate Professor
School of Molecular Sciences

iDEP Approach with Membrane Valves

AzTE Case #M16-249P

Background

Insulator-based dielectrophoresis (iDEP) is the motion of particles due to a force from a uniform electric field. IDEP is useful in the manipulation of particles, cells and even organelles. However, IDEP forces scale dependent upon the geometry, making separation, preconcentration and fractionation difficult to achieve large-scale. Furthermore, the dielectrophoretic forces can change with the application of larger electric potentials, but analytes may degrade upon this exposure. Therefore, there is a need to design an iDEP device that is compatible with biological particles.

Invention Description

Researchers at ASU have developed an iDEP device capable of processing biological particles. A thin membrane separates a fluid layer and an actuator layer. The actuator layer pneumatically controls the thin membrane layer. Upon the application of a voltage across the fluidic channel, the electric field around the membrane becomes non-uniform and becomes tunable by the amount of deflection of the electric field. Overall, the active deformation of the geometry due to changes in applied pressure allows tunability of the iDEP device's electric field for the manipulation of particles.

Potential Applications

- Biological particle analysis
- Particle trapping, fractionation and preconcentration

Benefits and Advantages

- **Tunable Electric Field** – The actuator layer exerts pressure on the pneumatic thin layer, causing non-uniformity of the electric field, which allows for the manipulation and analysis of particles
- **Wider Range of Use** – The tunability allows a greater variety of analytes for processing

Intellectual Property

Status:

Pending

Contact

Bill Loux

Director of Business
Development, Physical
Sciences

Arizona Technology
Enterprises, LLC (AzTE)

P: 480.884.1992

F: 480.884.1984

BLoux@AZTE.COM

TECHNOLOGYVENTURES@AZTE.COM

www.AzTE.com