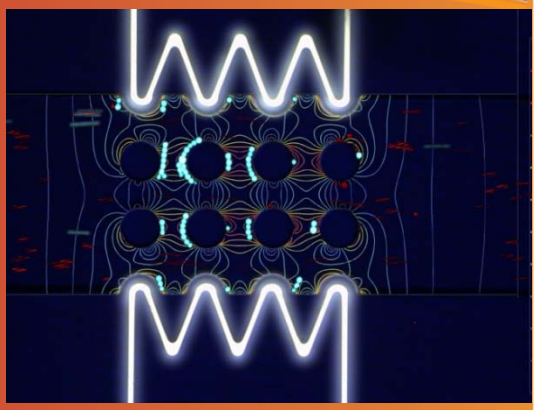
LICENSING OPPORTUNITY

Contactless Dielectrophoresis

for advanced cell sorting and enrichment



Scientists at Virginia Tech have developed a novel system for cell sorting and recovery that requires no toxic chemicals or labeling of cells. Dielectrophoresis (DEP) creates a non-uniform electric field which is used to separate and identify cells and microparticles based on size or electrical properties. In this new system, the electrodes are not in direct contact with the biological sample, and insulating barriers avoid damaging the cells. The methods are particularly valuable for recovering highly enriched and viable cell populations for use *in vivo*.

APPLICATIONS

- Cancer detection
- Drug screening
- Treatment planning
- Disease or pathogen detection and treatment
- Sorting or sensing
- Identifying rare cells
- Sample isolation and enrichment

ADVANTAGES

- Simple chemical-free sample prep
- No antibody labeling required
- Contamination-free recovery
- Easily applicable to automation
- Inexpensive and simple fabrication
- Compatible with other microfluidic technologies
- Efficient and repeatable

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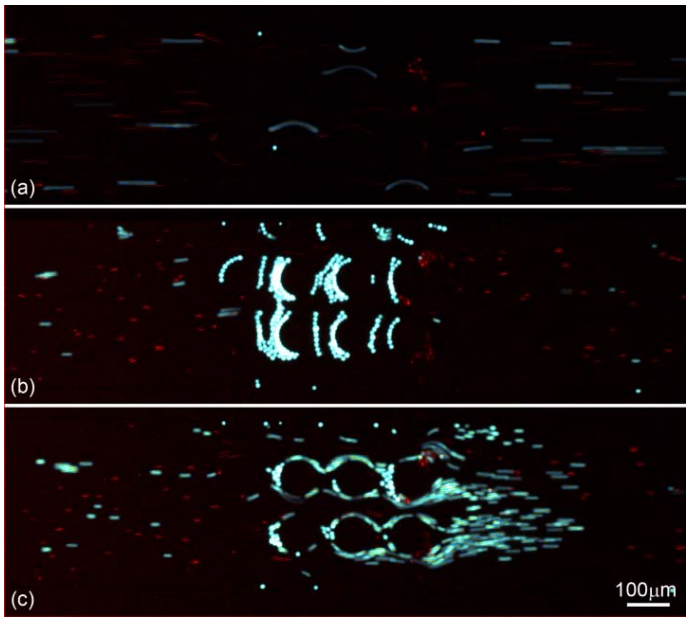
VIRGINIA TECH INTELLECTUAL PROPERTIES

TECHNOLOGY

The electrophoretic force induced on particles by electric fields has been exploited for the identification of proteins using gel electrophoresis since the 1930's. The ability to translate this technology into a method to sort, separate, collect, or enrich samples of cells has been stifled due to hydrolysis, contamination from electrodes or diluents, difficult and expensive fabrication processes, and damage from the high electric field required. Contactless dielectrophoresis (cDEP) overcomes these challenges by placing samples in a microfluidic channel which is physically separated from the electrodes. This unique "fluid electrode" system drastically simplifies the fabrication process while reducing cost and complexity. Furthermore, this technique has tremendous potential for sample isolation and enrichment for drug screening, disease detection, and treatment planning. In conjunction with other technologies, cDEP can be utilized to yield fully automated lab-on-a-chip systems.



LEAD INVENTOR

Dr. Rafael Davalos

Dr. Davalos, Assistant Professor and faulty member of the Virginia Tech-Wake Forest University School of Biomedical Engineering and Sciences, earned his PhD in Bioengineering and MS in Mechanical Engineering at UC Berkeley. He was the 2006 recipient of the Hispanic Engineer National Achievement Award for Most Promising Engineer or Scientist. He is a co-inventor of irreversible electroporation techniques and tools for targeted ablation of tumors and other diseased tissues.

For more information about this product, or to discuss licensing terms, please contact Jackie Reed with Virginia Tech Intellectual Properties at 540/443-9217, or jreed@vtip.org.

Left: Selective trapping of THP-1 human leukemia cells. (a) Cells travel through channel from left to right unimpeded. (b) cDEP voltage is applied and live (green) cells are collected while dead (red) cells are not. (c) Removing voltage releases enriched sample.