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U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health



National Institutes of Health Commercialization Assistance Program  
(NIH-CAP)

## Company Profile

**Industry Sector:** Laboratory Instrumentation and Life Sciences Tools

**Company Overview:** OpenCell Technologies is addressing the need for efficient, scalable and cost-effective transfection of difficult-to-transfect cells by introducing a fundamentally different approach to intracellular delivery. Since its founding in 2008, OpenCell has focused on transitioning a micromachined ultrasonic fluid atomizer from demonstration prototype to viable commercial transfection platform. This effort has resulted in the STEAM (Single sample Treatment via Electrosonic Actuation Microarray) system. Drawing on the founders' strengths in research and development of MEMS-based tools and devices, and leveraging local university resources, our immediate goal is to minimize commercialization risk and to position OpenCell as an attractive partnering or acquisition target.

**Target Market(s):** Life Sciences and biomedical research entities/organizations including companies, academic institutions, and independent laboratories.

## Key Value Drivers

**Technology\*:** STEAM is the only intracellular delivery platform that exploits focused mechanical AND electric fields to achieve insertion of biomolecules into cells. Fundamental to STEAM is an identical and carefully controlled electromechanical environment imposed on all cells of a population as they are ejected one-by-one through cell-sized orifices. Resultant uniformity of treatment is critical to achieving high efficiency.

**Competitive Advantage:** STEAM is the only physical delivery method that requires no special buffer or media, reducing operating expenses. While the look and feel of the STEAM system are familiar, the capability to precisely control biophysical actions on a single-cell basis without sacrificing throughput is a feature that no competing technology offers. With a new approach to transfection, OpenCell holds a broad IP position.

**Plan & Strategy:** OpenCell is developing a stand-alone system that addresses research markets directly. STEAM is best suited to a 'razor/razorblade' revenue model with the instrument representing the 'razor' and associated products (e.g., disposable sample cartridges) the 'blades'. OpenCell is seeking strategic partners for scale-up manufacturing, marketing, and distribution.

\*Technology funded by the NIGMS and being commercialized under the NIH-CAP

## Management

**Operations:** J. Mark Meacham, PhD, President and CEO

*Dr. Meacham has been advancing the technologies underlying STEAM operation for 10 years.*

**Board/ Advisors:** Levent Degertekin, Woodruff Chair in Mechanical Systems at Georgia Tech

*Co-founder and inventor of STEAM with expertise in ultrasonic sensors/actuators and MEMS/nanotechnology. Startup efforts include venture-funded Sensys Instruments (acquired by Thermo-Wave) and Silicon Audio (formerly Metro-MEMS/Radiant Acoustics).*

Andrei Fedorov, Woodruff Professor of Mechanical Engineering at Georgia Tech

*Co-founder and inventor of STEAM with expertise in MEMS/nanotechnology, complex fluids, and bioanalytical instrumentation.*

OpenCell receives guidance related to positioning, strategic planning, and IP protection from Jim Heitner (founder, Ripple Management), our attorneys, and the Georgia Tech Advanced Technology Development Center (ATDC).

## Product Development

**Stand-alone Instrument:** Completed development of a beta prototype that has demonstrated 100% uptake efficiency in multiple cell lines and transfection efficiency as high as 90% while maintaining high viability (see images below).

**Disposable Cartridge:** Manufacture of polymer sample cartridges with embedded micromachined nozzle arrays will be completed during Q1 2013.

**Representative Application:** Characterization of transfection in primary monocytes will be completed during Q2 2013 using a more product-ready instrument.

