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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: Pharma/Biotech (Instrumentation/Tools)

Company Overview: CFD Research Corporation (CFDRC) is a technology focused small business, specializing in the development of innovative products and services, across three major markets (Aerospace, Life Sciences and Materials). The Biomedical division is focused on the development of application-specific microfluidic biochips, including the Synthetic Microvascular Network (SMN), for diverse medical/biotech applications. CFDRC is located in Huntsville AL and has over 90 employees, most of them with advanced degrees. We are currently exploring several means of bringing SMN to market – a dedicated start-up, product development in current organization with sales/distribution partners or technology licensing.

Target Market(s): Nanotechnology enabled drug delivery is a rapidly growing field and a primary target market. In addition, Pharma/Biotech firms in the Inflammation and Oncology area and academic research groups focused on cell adhesion are expected to use this product as well. Market research indicates that total addressable market for this technology is a growing one, potentially estimated at a hundred million dollars.

Management

Leadership:

Ashok Singhal, Ph.D President, CFDRC

Shankar Sundaram, Ph.D Vice-President, R&D

B. Prabhakarandian, M.S. Senior Principal Scientist & Technical Lead

Scientific Advisory Board:

Mohammad Kiani, Ph.D. Professor of Mechanical Engineering and Radiation Oncology, Temple University

Key Value Drivers

Technology: The Synthetic Microvascular Network (SMN) is the first in-vitro, cell-based toolkit that enables real-time, dynamic screening of candidates for cellular drug delivery and adhesion under physiologically realistic conditions. The toolkit is comprised of (a) disposable, optically clear, plastic chips with imprinted microchannel networks compatible with real-time, quantitative microscopy (b) micropumps to pump/perfuse cell buffers and solutions and (c) data analysis software to process the recorded images of cellular behavior and drug delivery over the entire network.

Competitive Advantage: Nanoparticle delivery optimization currently relies on difficult, expensive and time consuming in-vivo animal experiments. The SMN offers an effective and accurate in-vitro alternative to in-vivo testing. By reproducing the vascular microenvironment including scale (10-100 μ m), morphology, fluidics and cellular composition, SMN provides more accurate prediction of in-vivo behavior, compared with currently used static incubational assays (well-plate) or idealized flow chamber constructs. Another significant advantage is the very large (several orders of magnitude) reduction in volume of reagents and cell culture supplies needed. These advantages translate to faster therapeutic development times with lower cost, providing strong motivation for our clients to adopt this technology in their development process.

Product Pipeline

