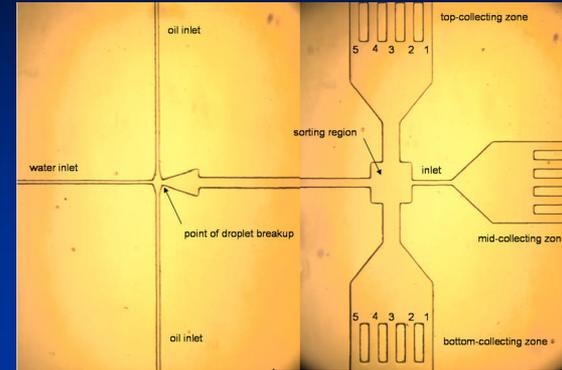


A Nanodroplet Process for Advanced Microencapsulated Drug Formulations Nanotrope, Inc., 2033 Cambridge Ave., Cardiff, CA 92007

Identification and Significance of the Innovation

The nanodroplet technology innovations include liposome synthesis methodology, biochemical formulations and the microfluidic system for the generation of lipid encapsulated protein drugs for targeted drug delivery. This encapsulation process is enabled by the utilization of immiscible fluids to transform continuous fluid streams into highly monodispersed, isolated droplets with tight control of droplet size and generation rate. It is envisioned that liposome formulations that contain a protein drug payload and surface receptor to target specific cells may be generated on-demand and tailored for individualized therapeutics.



Nanodroplet synthesis device and resulting multifunctional liposomes

Technical Objectives

1. Demonstrate engineered 200 nm liposomes with standard deviations better than 5%.
2. Develop high throughput synthesis device.
3. Demonstrate scale-up quantities (10 g/hr) of liposomes.
4. Demonstrate 6-month particle stability through the optimization of liposome lipid and surface chemistry.
5. Demonstrate drug release and uptake by cancer cells.
6. Demonstrate a 50% improvement in drug uptake and efficacy in mouse models over commercial formulations.

Work Plan

Task 1: Nanodroplet generator optimization (Mos 1-18)

Task 2: Liposome Formulation (Months 1 - 18)

Task 3: Pharmacokinetics and efficacy (Months 12 - 24)

NASA Applications:

- Drug storage
 - Point of care mixing
 - Custom drug synthesis
 - Sample preservation
- } For extended manned flights

Non-NASA Applications

- Point of care drug delivery
- Targeted therapies
- Diagnostics
- Advanced materials

Firm Contacts:

Dr. Donald A. Ackley, Pres/CEO, Nanotrope, Inc.
Ph: 760-942-0301 donackley@cox.net