
Amsterdam Fluidics
simplifies the
process and
costs with
encapsulating
drugs.
TigerLaunch
Go BIG.
NYC Competition
Finalists
PENN I-CORPS
Spring 2016
Members
Y Prize
COMPETITION
Finalists

Many drugs (ie: chemotherapy drugs) create

BAD SIDE EFFECTS

like hair loss, liver damage, and vomiting because they target

HEALTHY & DISEASED

cells cells

Recently…
scientists have been
able to **encapsulate**
drugs to avoid targeting healthy cells.
This has been a **huge** success.

For example, J&J makes over $500 million annually of its encapsulated chemotherapy drug, doxil, as its price increases from

$25 per dose to **$1000** per dose

ONE PROBLEM

It is incredibly difficult to encapsulate drugs.

Using the same doxil drug as an example, only one plant had the capability to encapsulate this drug for J&J.

In 2011, that plant had to shut down, resulting in J&J losing

82%

of its $500 million/year revenue. These problems

lingered

for

years

Before

17

machines needed to encapsulate a drug.

After

1

chip needed to encapsulate a drug.

Our solution:

Amsterdam Fluidics

uses a single chip to complete the entire drug encapsulation process normally processed in an encapsulation facility.

By encapsulating drugs through a bottom-up method instead of top-down, we fundamentally improve manufacturing efficiency for pharmaceutical companies.

$25

per vial cost

50¢

per vial cost

5 days

to produce a drug batch

3 Hours

to produce a drug batch

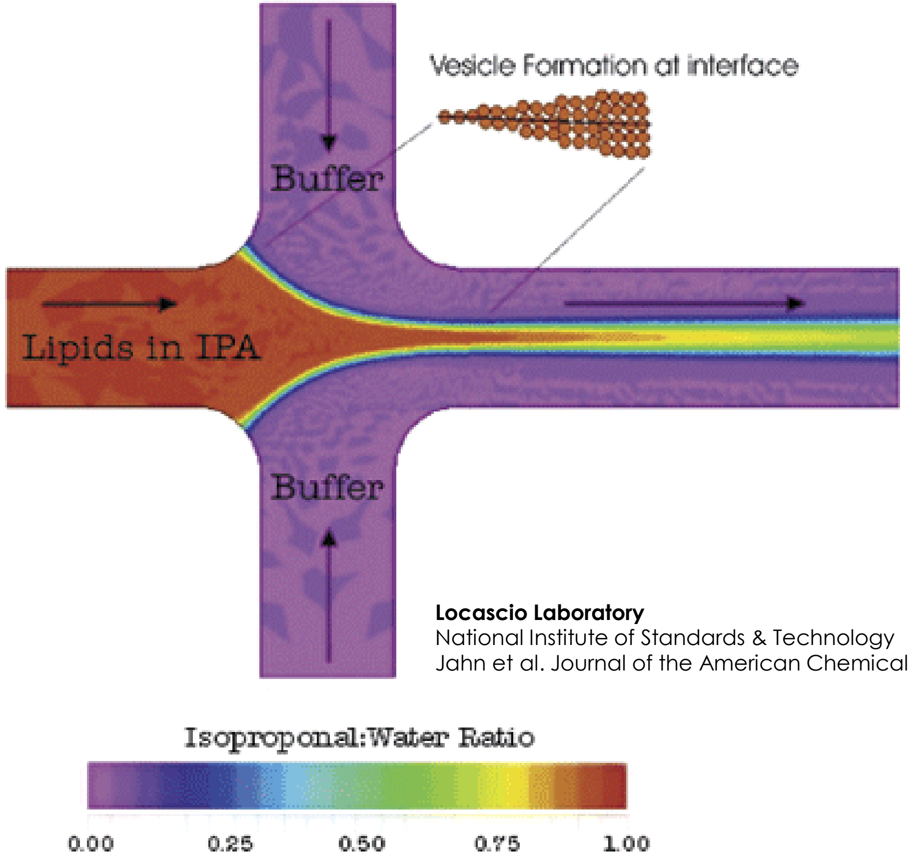
There is a 7.4 billion market for encapsulated drugs currently on the market, which we plan to initially target. The secondary market is the universe of drugs still being developed in clinical trials right now that we can encapsulate the moment they begin commercial production.

The Science

> This proposed design should result in liposome encapsulated drugs

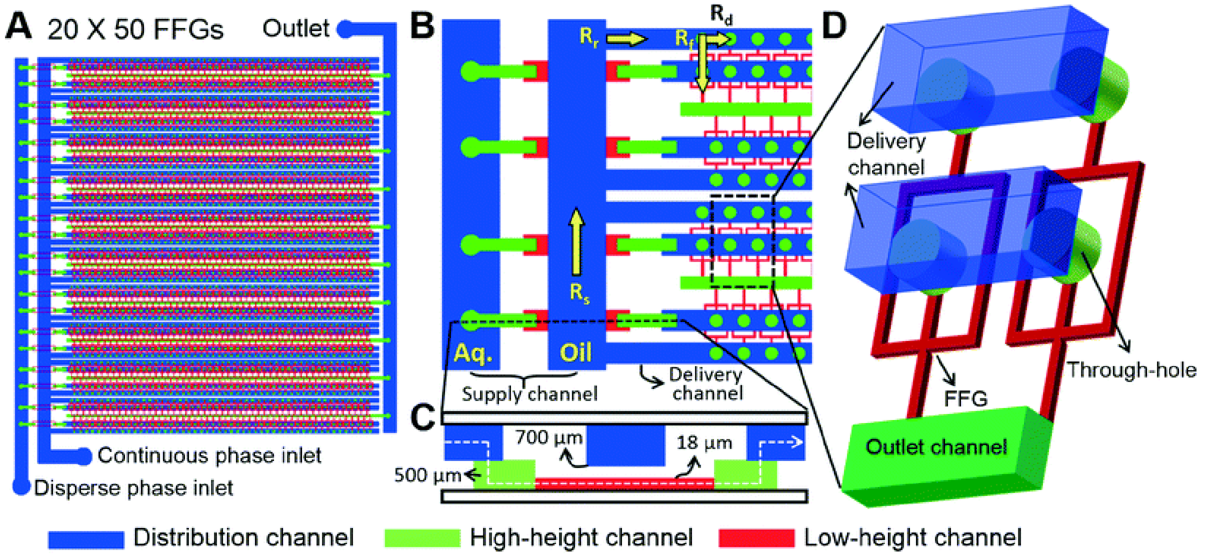
Lawrence D. Mayer
Chief Scientific Officer
Celator Pharmaceuticals

Hydrodynamic Focusing in Microfluidic Channels



Locascio Laboratory
National Institute of Standards & Technology
Jahn et al. Journal of the American Chemical Society, 2004

Kilo-Scale Droplet Generation



Daeyon Lee Laboratory
University of Pennsylvania
Jeong et al. Lab Chip, 2015

Overly Simplified Explanation

The ability to encapsulate drugs through a chip has always been possible, except a chip could historically only encapsulate at 1mL per hour. With recently created microfluidics technology, we can now encapsulate at 3 liters per hour, a **3000x increase.** This production is now **fast enough to match current industrial scale drug production** that entire factories previously needed.

The Team

The **Innovator**

Enrique has conducted extensive research in drug discovery and cancer at the University of Cambridge. He has also worked as a healthcare consultant for Gassert Consulting.

PHD candidate, Biochemistry & Molecular Biophysics

Combines expertise in science and technology with understanding of health needs

The **Manager**

Ronald has worked with clients like Eli Lilly, Johnson & Johnson, and Wellpoint as a consultant and worked in venture capital.

MBA, Innovation Management Certificate, Engineering

Provides marketing, budgeting, finance and project management

The **Builder**

Alex has previously conducted research on polymer-based solar cells at the institute of Nanoelectronics in Munich, Germany.

Masters, Nanotechnology

Provides technical expertise in the fabrication process of the chip

Mentors

Jeffrey **Barrett**

Vice President, Research and Development, Interdisciplinary Pharmacometrics, Sanofi

Elliot **Menschik**

Founder, DreamIT Health

Richard **Kollender**

Partner, Quaker BioVentures

Carolyn **Wilson**

Associate Director for Research at FDA

Timeline

TODAY

PRODUCT TIMELINE

May 2016
- Complete I-Corps program

June 2016
- Complete prototype* (including consumables, raw material and optimization steps)
- File patent approval for first set of encapsulation types

December 2017
- File patent approval for second set of encapsulation types

January 2018
- Get FDA Approval (CMC designation under CDER review)

FINANCIAL TIMELINE

June 2017
- Complete summer accelerator

September 2017
- Raise $5 million series A

June 2018
- Secure first client

December 2018
- Break even on company operations

June 2020
- Secure second client

PROTOTYPE COSTS

Item Name	Unit Price ($)	Amount	Total Price ($)	Notes:
Silicon Master Mold	100	3	300	1 mold can make ~20 PDMS chips Will be trying at least 3 different designs
PDMS chips	6	50	300	
Doxorubicin HCL (1g)	427	1	427	Provider: LC Laoratories (D-4000) Expected to experiment with ~50 vials (20mg/vial)
Isopropyl Alcohol (1 gallon)	25	2	50	
Pegylated Lipid powder (500mg)	485	1	485	Provider: Avanti Polar Lipids (880120P)
Cleanroom equipment rental	30/hr	10	300	
Comparable Doxil, reference	1100	1	1100	To prove bioequivalence