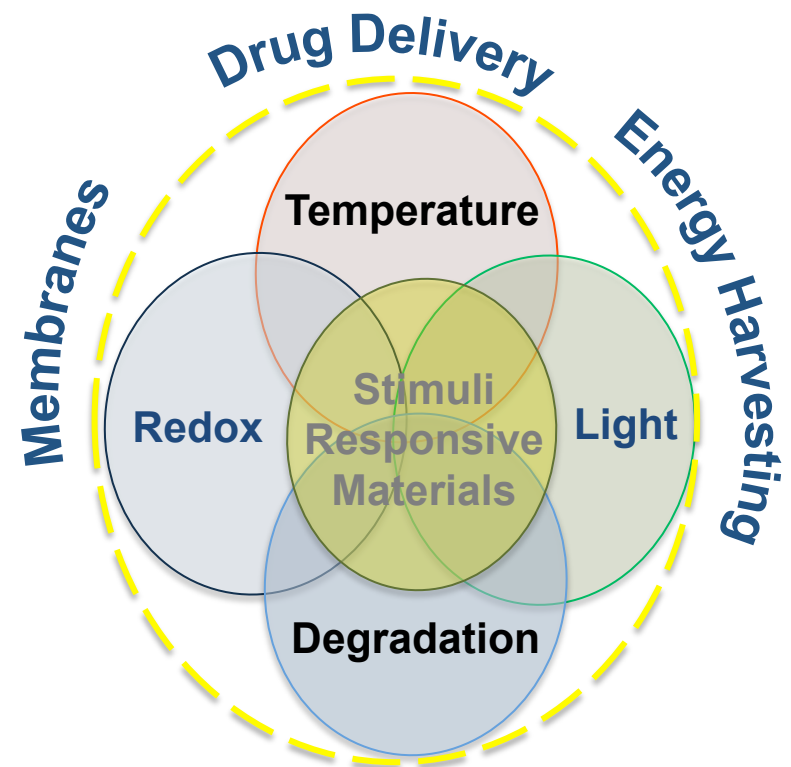


Smart method to enhance direct drug delivery to uterine fibroid by injection



Marlene K. Taylor, Ph.D.

NCCentral
UNIVERSITY

Duke
UNIVERSITY

The Goal

Problem

Strategy

Solution

Properties

Results

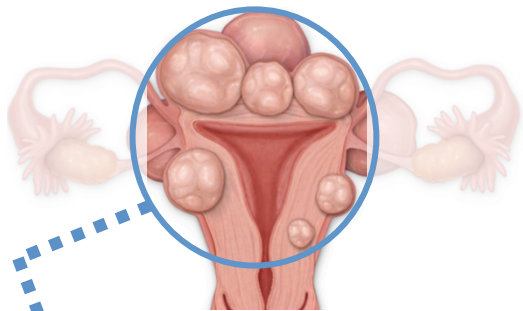
Interest

The Problem

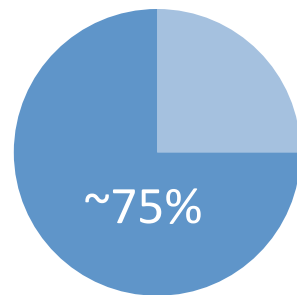
“I want to keep my uterus. What are my options?” -Anonymous

The Pro

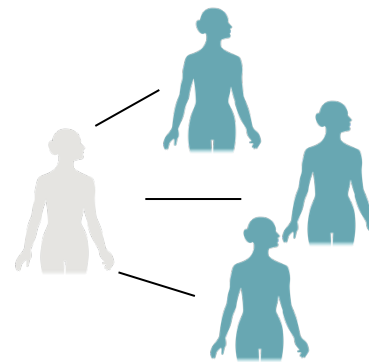
(Uterine Fibroids)



- Benign tumors
- Vary in size



of all
women

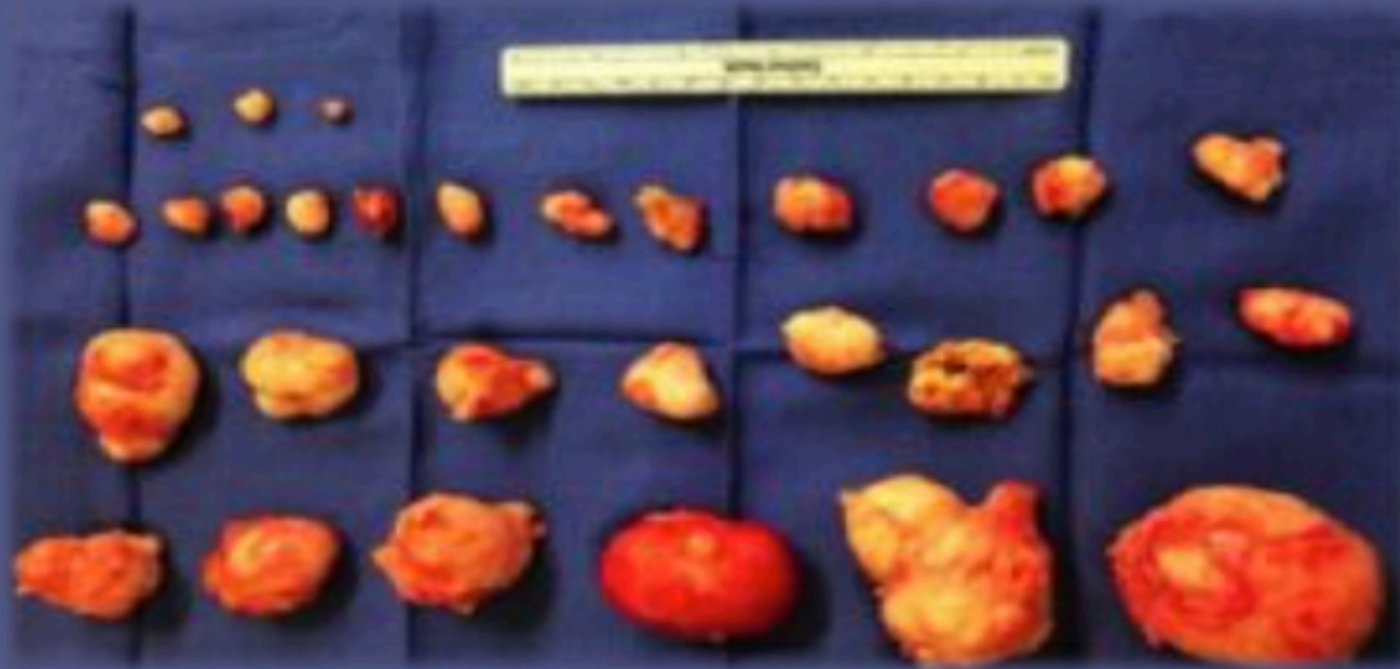


Blacks
(2-3 x more common)

Costs US healthcare
\$5.9 to \$34.4 billion
annually



- Associated with pain, bleeding, and infertility
- Hysterectomy surgery is the only permanent treatment option



**Various size problems....need
different strategies**

Strate

(Local Inje

Strategy

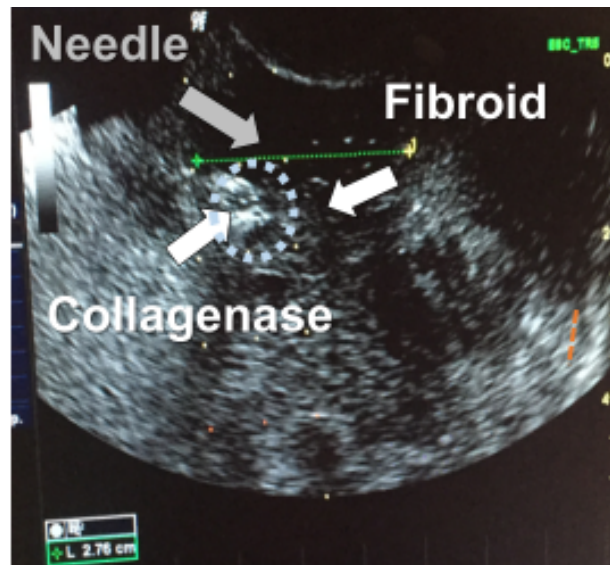
Can we “melt” the fibroid?

Strate

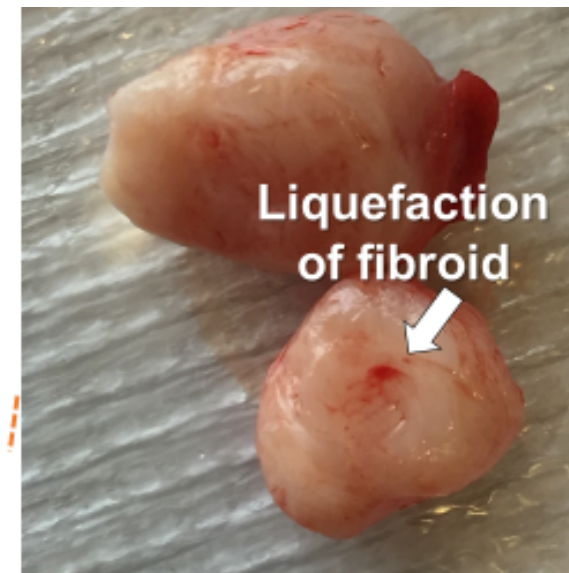
(Local Inje

Drug therapies cause systemic side effects
Local injection is viable
Collagenase is a promising candidate

Collagenase injection



Gross examination



We need to retain the drug long enough to “melt” the fibroid.

Soluti

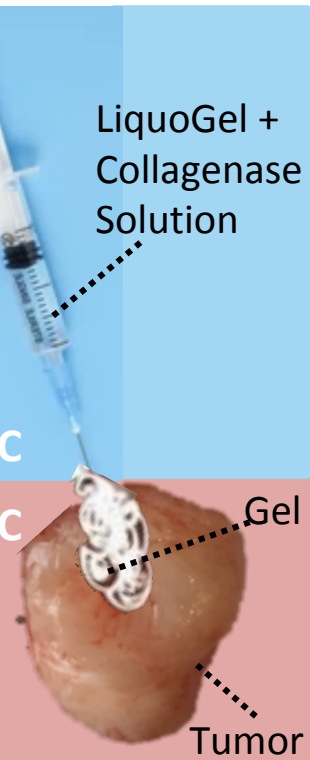
(LiquoG

Solution

Can we target therapy directly to the tumor?

Soluti

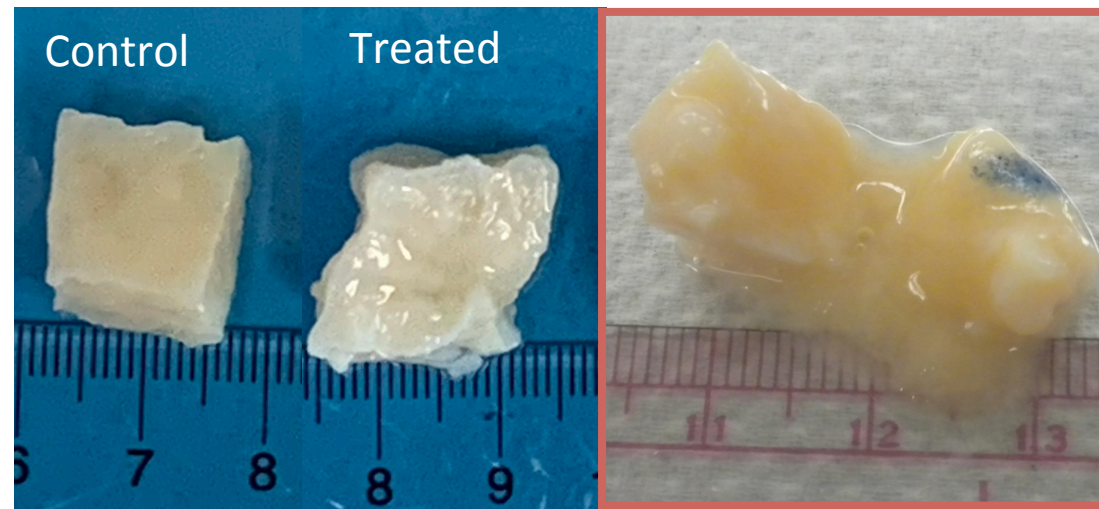
(LiquoGel



at triggered
form a gel
instantly)



Delays localized
drug release



Releases active
collagenase to melt
fibroids (48 h)

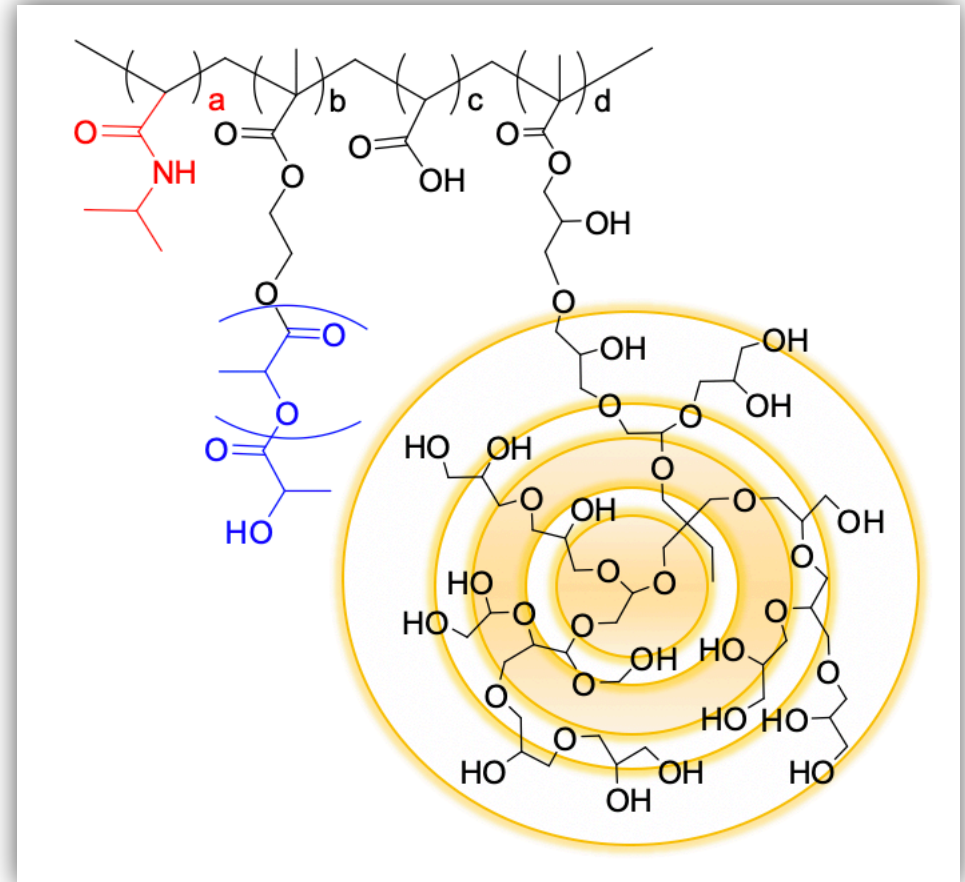
Free collagenase
(48 h)

Soluti

(LiquoG

What is LiquoGel?

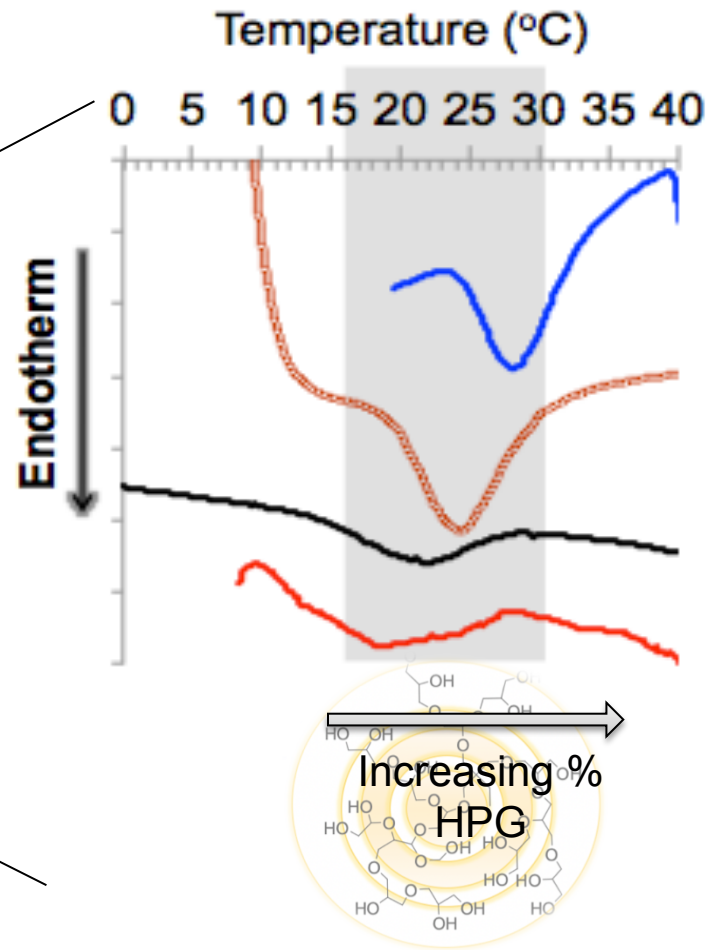
A copolymeric hydrogel
 Stabilized by physical crosslinks
 Easy to formulate and produce



Thermo-responsive



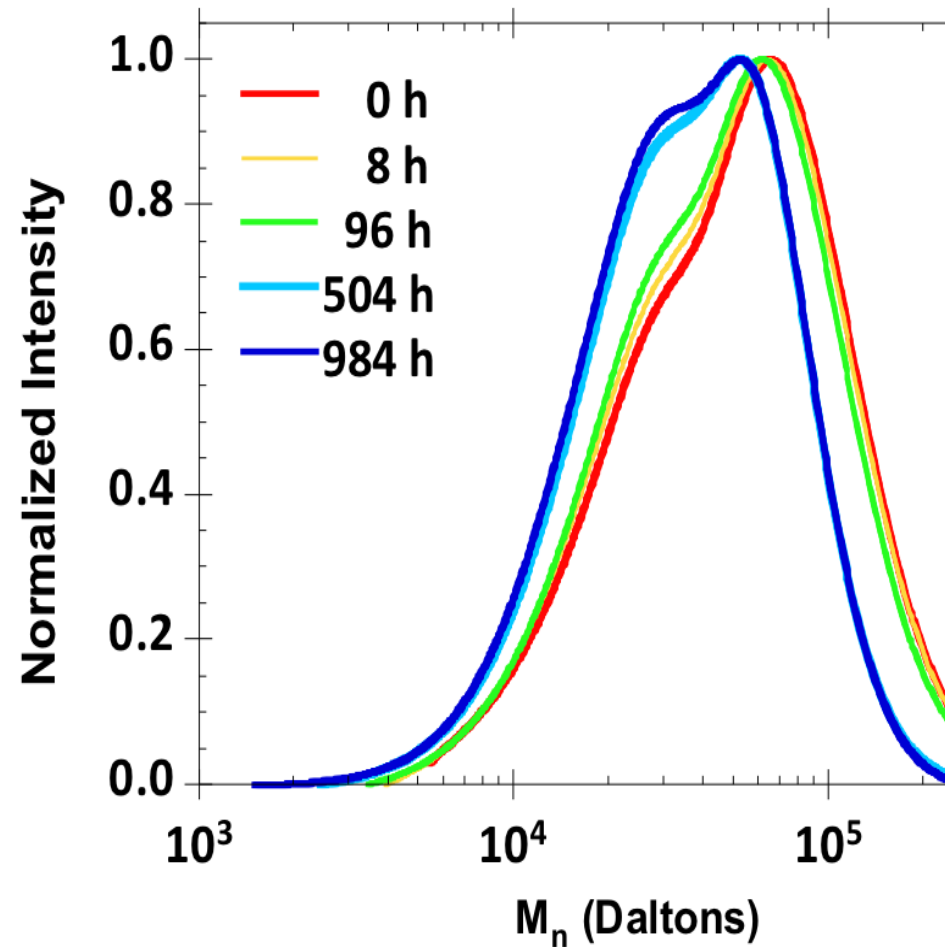
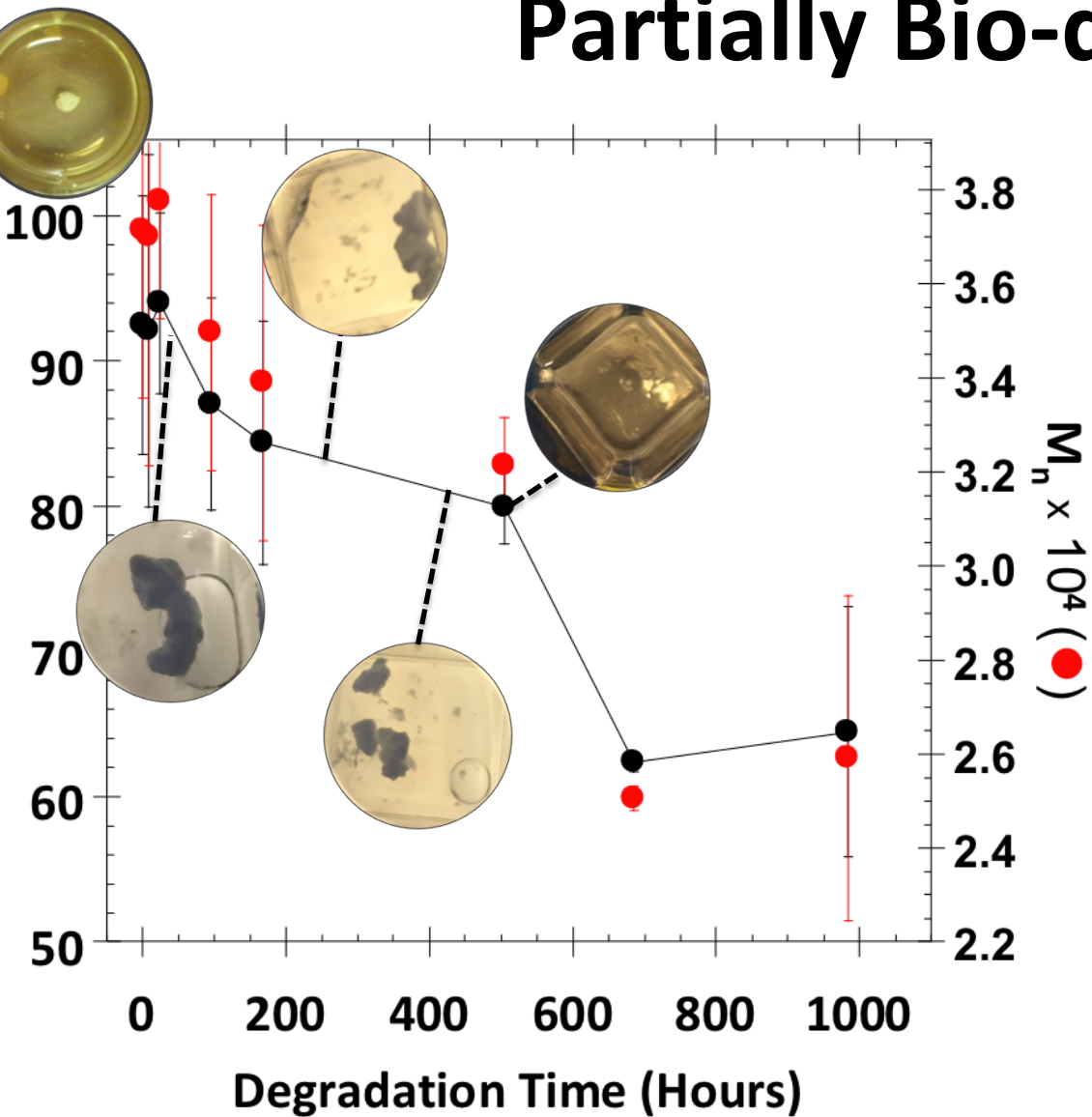
$\Delta T (^{\circ}\text{C})$



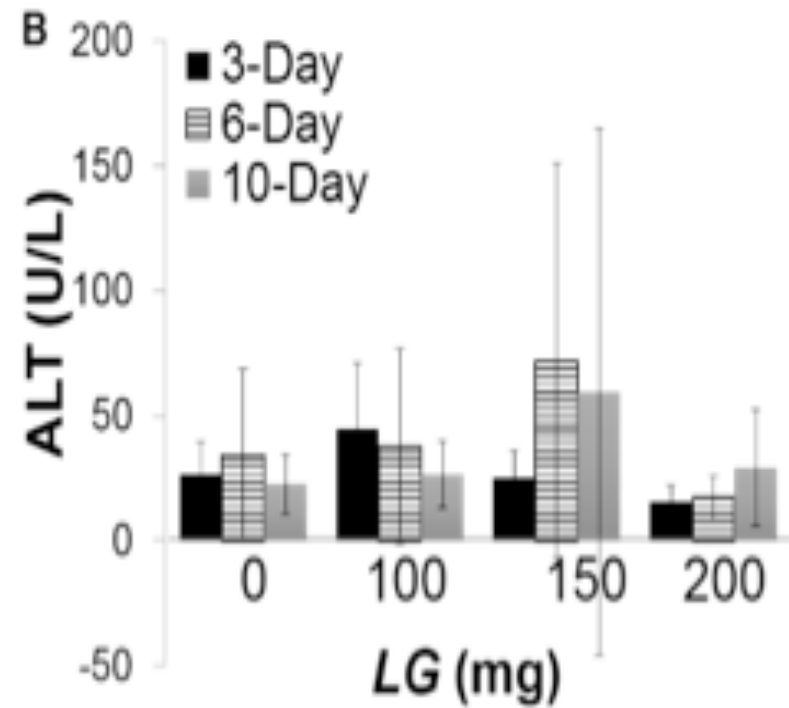
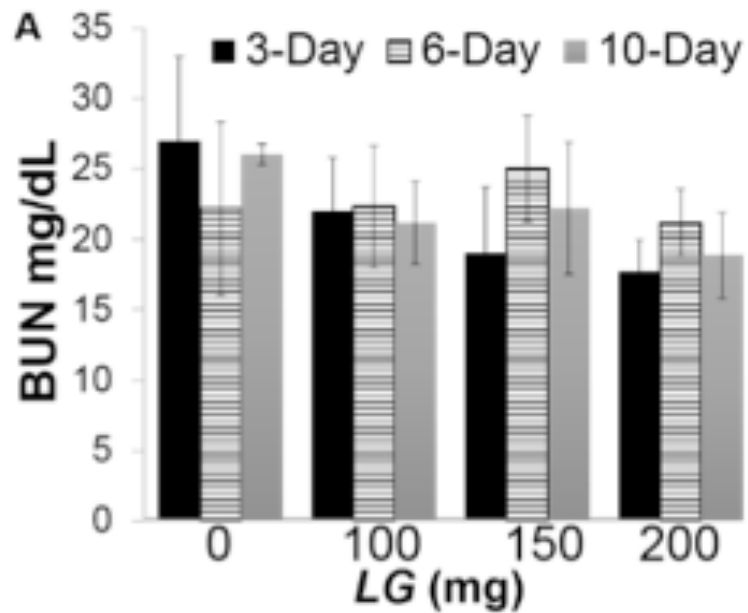
Partially Bio-degradable

Proper

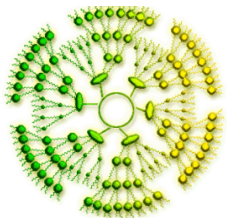
(LiquoG)



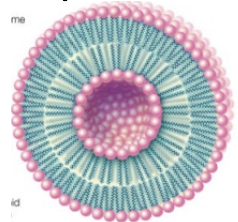
Not Toxic



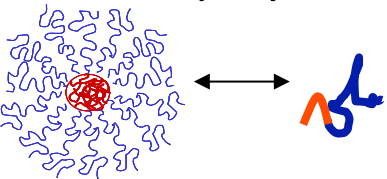
Dendrimers



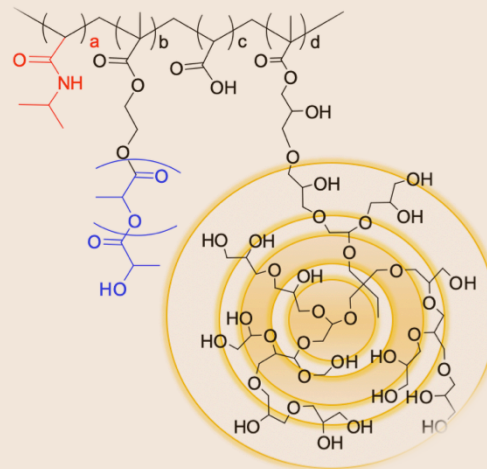
Liposomes




Block Copolymers



LiquoGel



- ✓ Entraps and releases many drug classes
- ✓ Sustained and localized release for hours
- ✓ Injectable (31G needle)
- ✓ Forms a stable gel
- ✓ Ends return to the “synthetic tool box” to deliver cocktail therapy mixture

- 
- Sep. 2, 2011 ● PCT/US2011/050405 filed with US PTO
Taylor, DK; et al J. Functional Biomaterials, 2011, 2(3), 173-194.
 - May 3, 2013 ● Filed US Patent Application No. 13/818782
 - Jun. 10, 2016 ● Pilot in vitro and in vivo studies conducted in collaboration with BioSpecifics
 - Aug. 29, 2017 ● Issued US Patent 9,744,138 - Treatment method and product for uterine fibroids using purified collagenase - Leppert, PC; Wegman, TL; and Taylor, DK
 - Jan. 1, 2019 ● Duke/NCCU CTSI Award supported preliminary ex vivo studies

LiquoGel Roadmap

Resu

(LiquoG

Optimization

Scaled Production

Application

Inter

nterest

/ho's expressed interest in this technology?

Uterine Fibroids 2016 Community Event

A Case for Women's Health



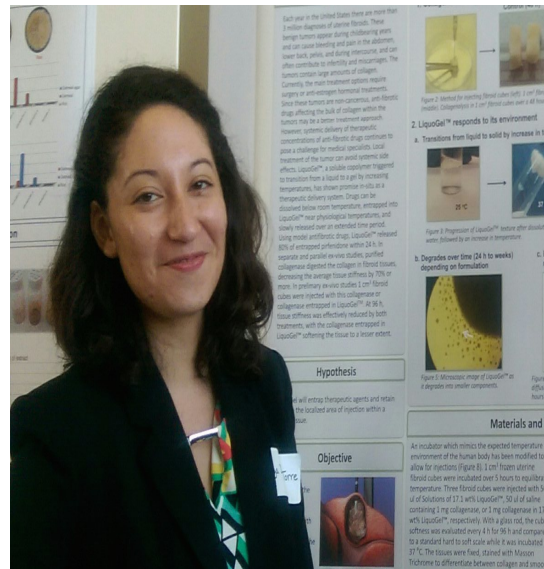
- What are Fibroids?
- Survivor Stories
- Treatment Options
- Clinical Trial Info

Saturday, Oct. 8th 8 AM – 3:30 PM

**MDC, Inc., 307 W Main Street
Durham, NC**

Registration (includes free lunch) at
www.uterinefibroids.Eventbrite.com

Co-sponsored by The Champion Fund and the
Delta Sigma Theta Distinguished Endowed Chair.



- ✓ 28 attendees
- ✓ 11 completed survey

Participants' Likelihood of Attending Next Conference

N=	Not at all Likely to Attend	Unlikely to Attend	Not sure if I'll Attend	Somewhat Likely to Attend	Very Likely To Attend	Mean \pm S Dev
11	0.0%	0.0%	9.1%	18.2%	72.7%	4.64 \pm .6

Participants' Ratings of the Learning Gains as a Result of the Conference

N=	No Gain or Very Small Gain	Small Gain	Moderate Gain	Large Gain	Very Large Gain	Mean \pm S Dev
11	0.0%	0.0%	18.2%	63.6%	18.2%	4.00 \pm .6

- ✓ *Captured conference highlights and disseminated by video [www.youtube.com](https://youtu.be/bgWLVAWvpRc) (<https://youtu.be/bgWLVAWvpRc>), www.taylorresearch.org and www.campionfund.org.*
- ✓ *Data show that the Year 2 conference was effective in addressing three major areas for participants:*

Providing strategies for working with policymakers to advocate for women's health

Learning better ways to support a family member with uterine fibroid

Teaching women's health and working with OB/GY professionals

Acknowledgements

Phyllis Leppert

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Sashi Gadhi

