

*Oklahoma State University
School of Chemical Engineering*



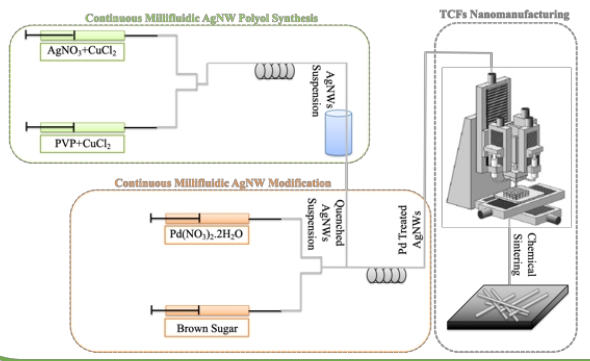
*From Sustainable and Continuous Metal Nanostructure
Manufacturing towards Future Nanotherapy
Biomanufacturing*



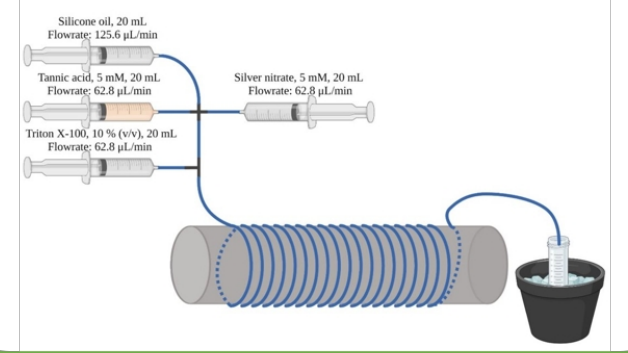
2023 NSF Nanoscale Science and
Engineering Grantees Conference

*Shohreh Hemmati, PhD
December 7th, 2023*

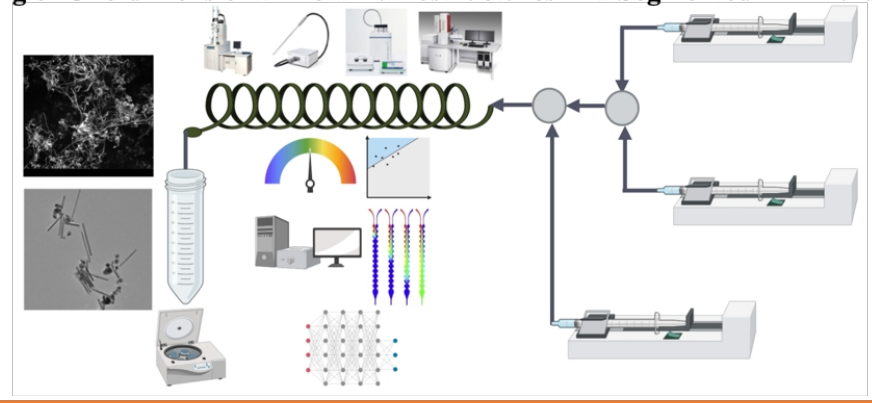
Continuous, Large-scale Manufacturing of Functionalized Silver Nanowire Transparent Conducting Films



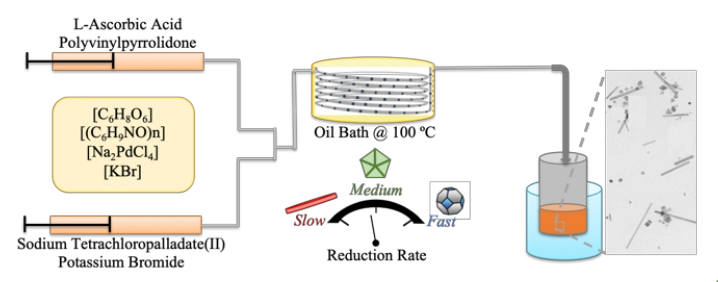
Continuous, Green, and Room-Temperature Synthesis of Silver Nanowires in a Helically-Coiled Millifluidic Reactor



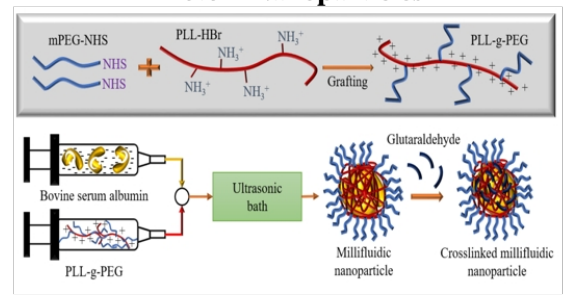
Nature Manufacturing of One-dimensional Metal Nanostructures in a Segmented Millifluidic Flow Reactor



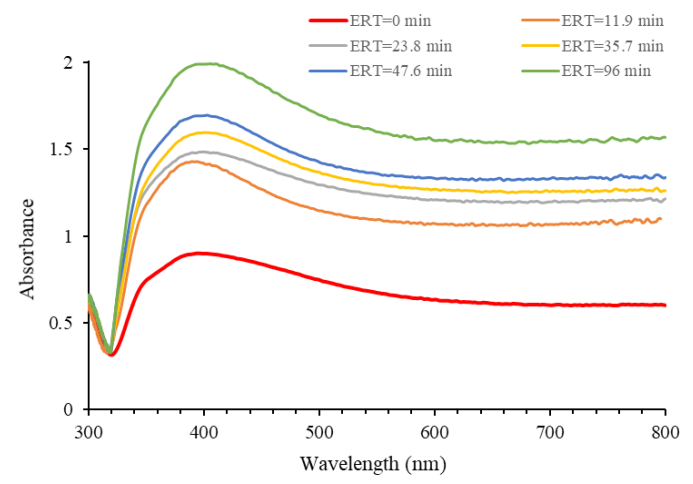
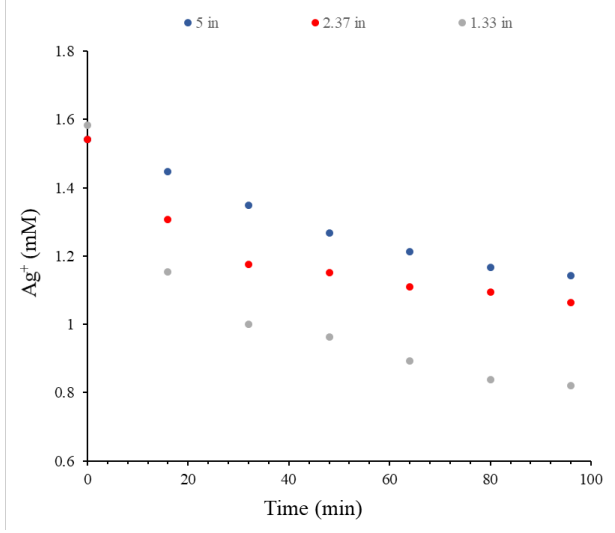
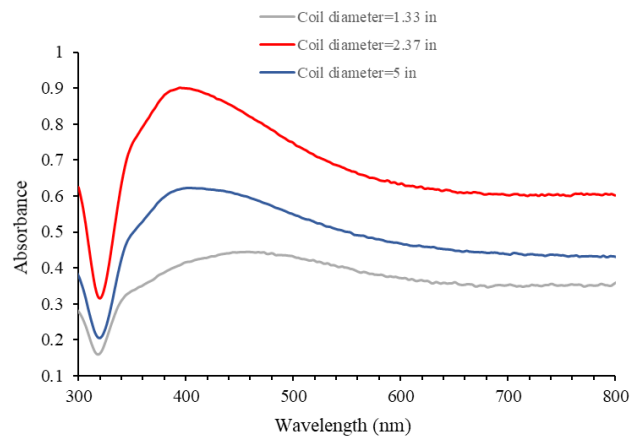
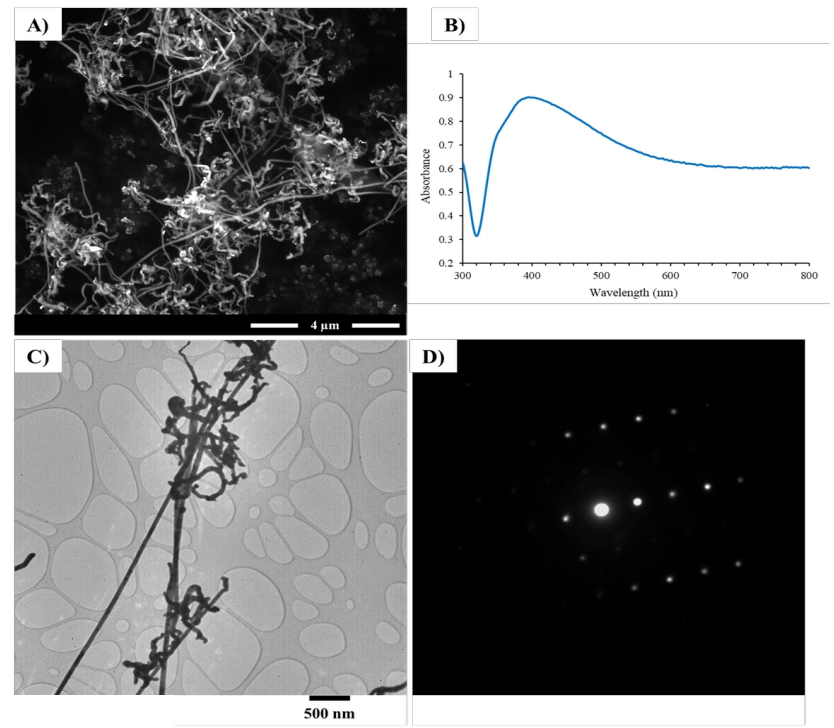
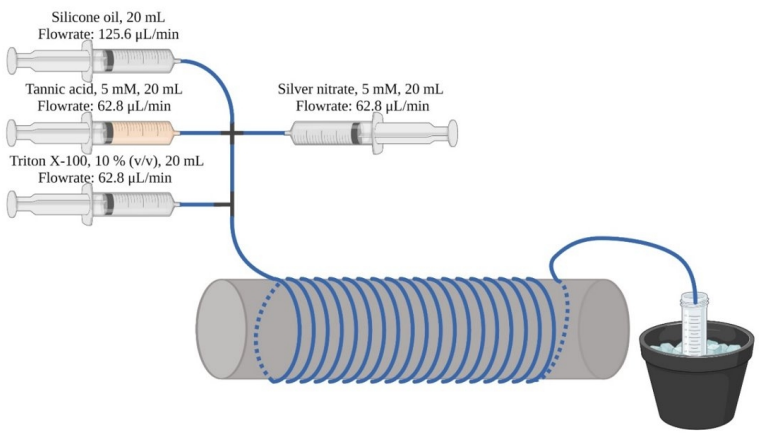
Sustainable and Continuous Synthesis of Palladium Nanorods in a Segmented Millifluidic Flow Reactor



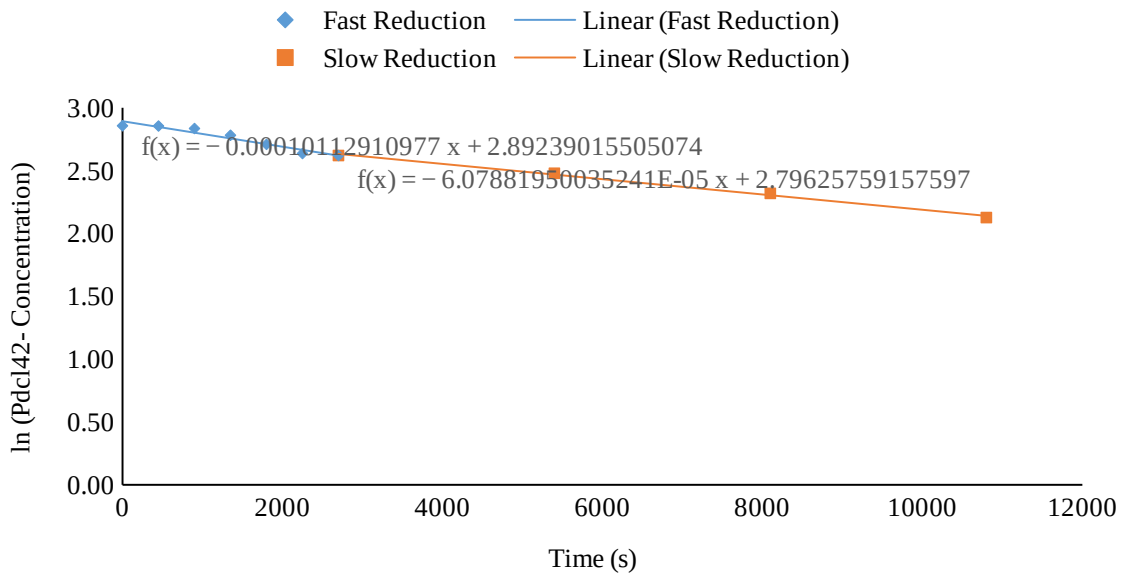
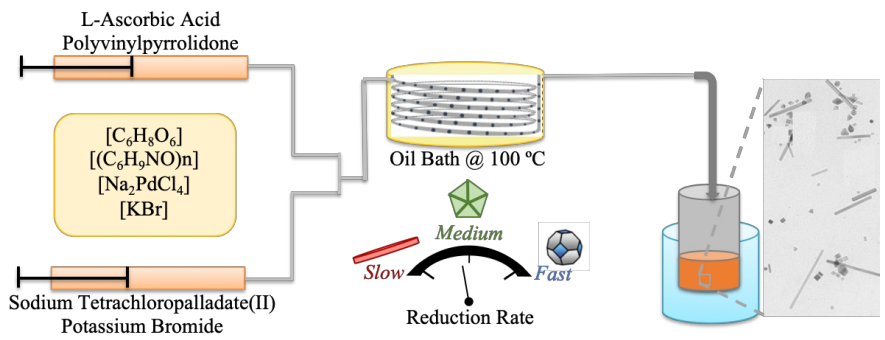
A Rapid Millifluidic Synthesis of Tunable Polymer-Protein Nanoparticles



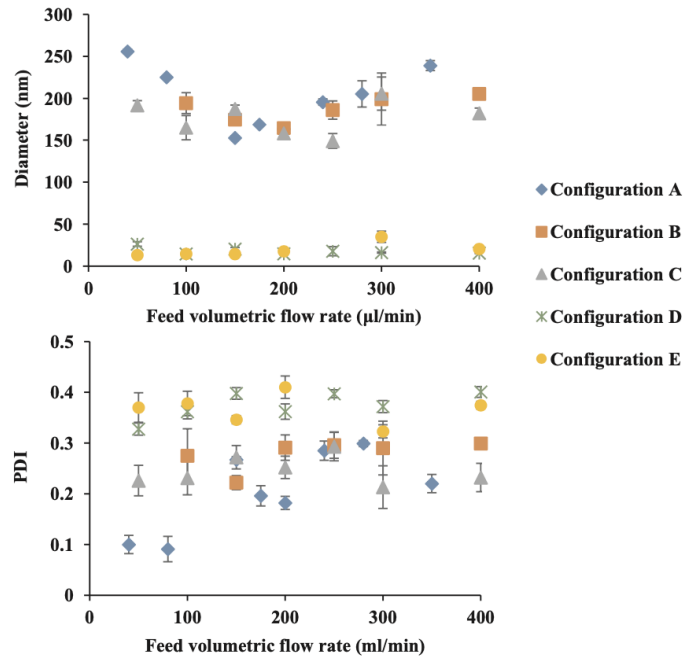
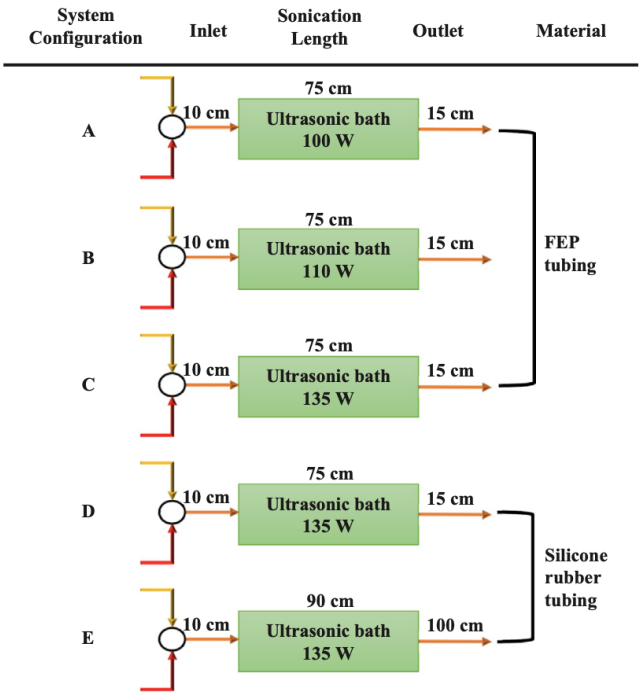
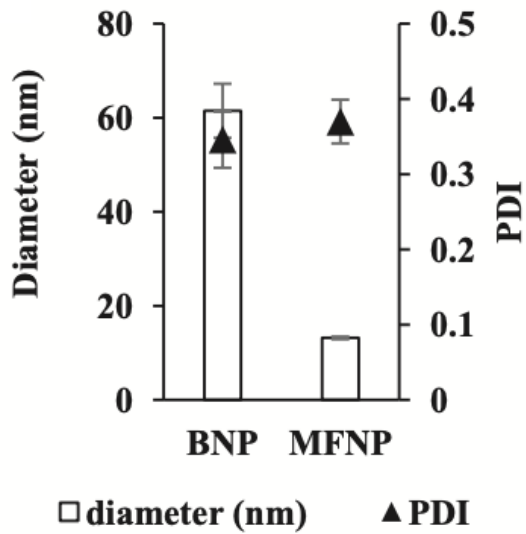
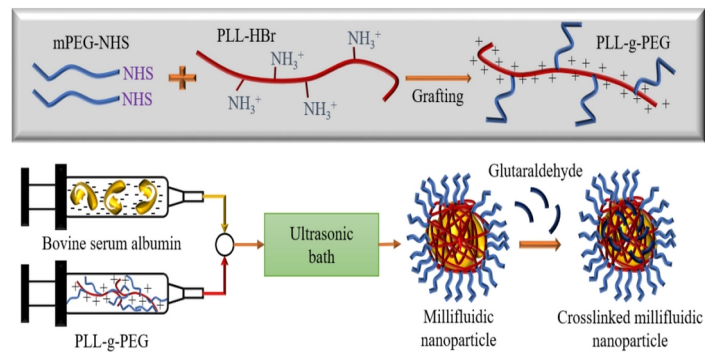
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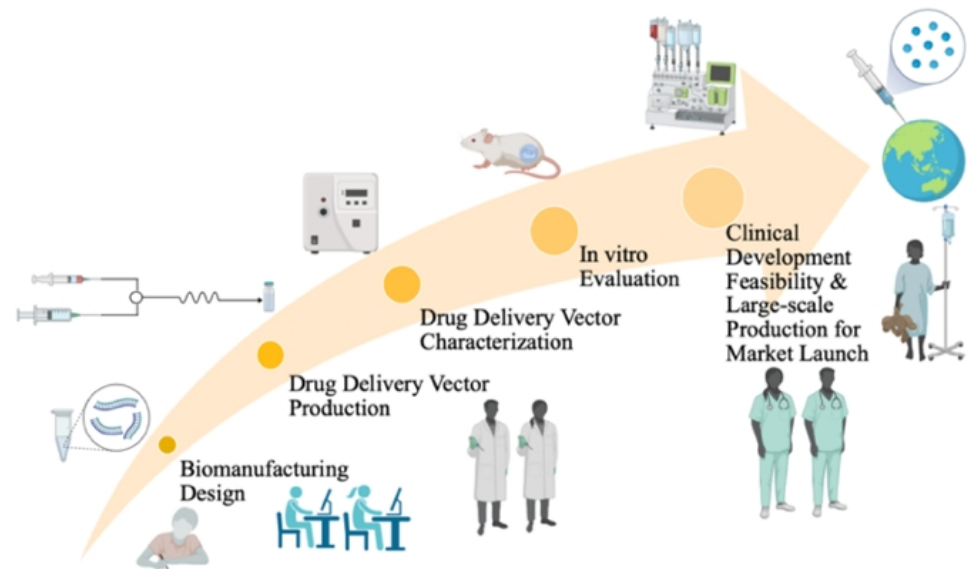
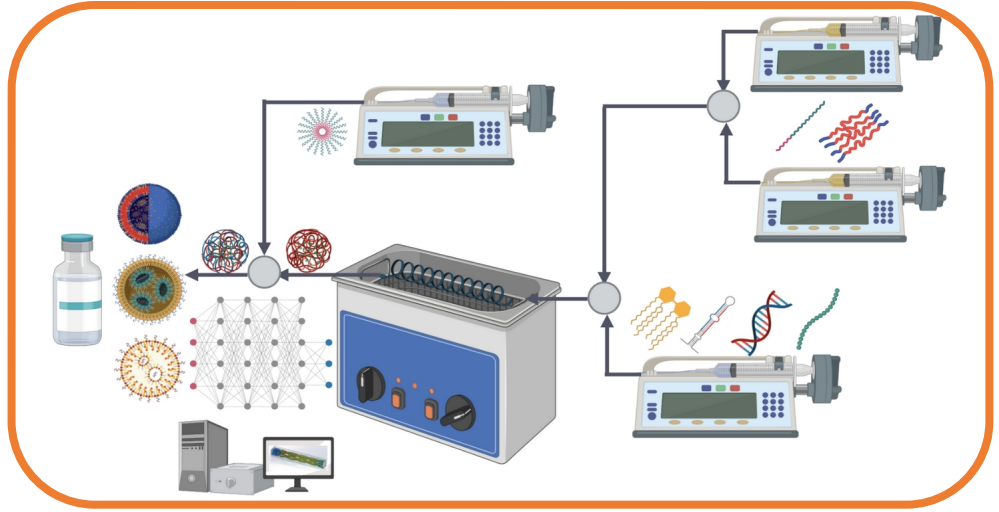
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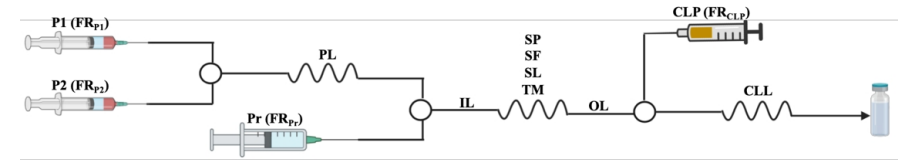
A Rapid Millifluidic Synthesis of Tunable Polymer-Protein Nanoparticles



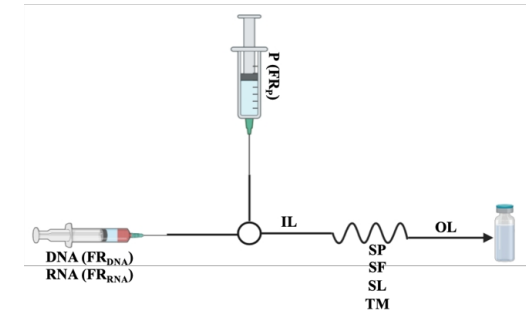
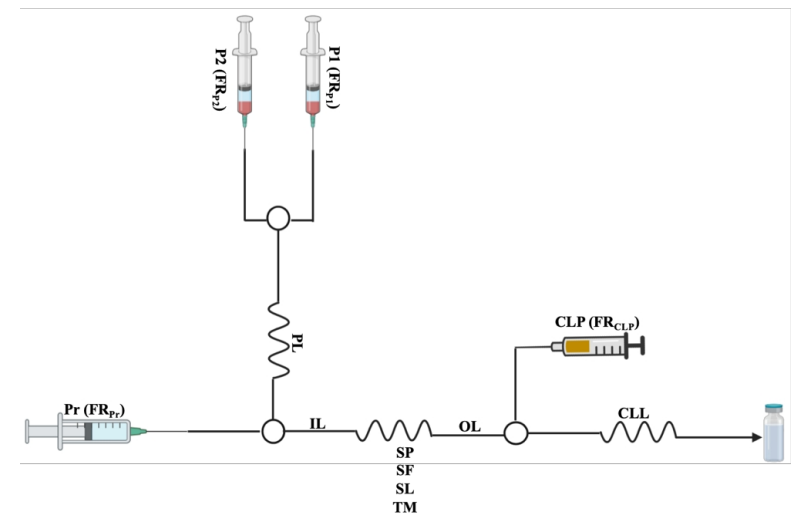
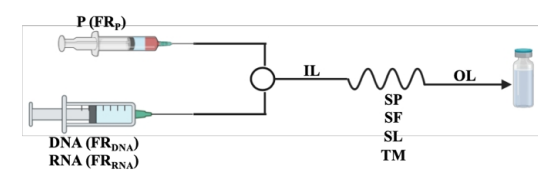
Transitioning from the lab to the Pharma Factor



Encapsulation of Protein



Encapsulation of DNA and RNA



P: Polymer, **FR_p:** Polymer Flow Rate, **PL:** Polymerization Length, **FR_{DNA}:** DNA Flow Rate, **FR_{RNA}:** RNA Flow Rate, **IL:** Inlet Length. **OL:** Outlet Length, **SP:** Sonication Power, **SF:** Sonication Frequency, **SL:** Sonication Length, **TM:** Tubing Material, **CLP:** Cross Linking Polymer, **FR_{CLP}:** Cross Linking Polymer Flow Rate.

ACKNOWLEDGEMENT!

OSU



**Dr. Sina
Kaabipour**



**Destiny
Williams**



**Vindula
Basnayake
Pussepitiyalage**



Tariq Tariq



**Dr. Jim
Smay**



**Dr. Josh
Ramsey**

University of Delaware



**Dr. Kevin
Solomon**

Purdue University



**Dr. Michael
Harris**



**Dr. Sue
Loesch-Fries**



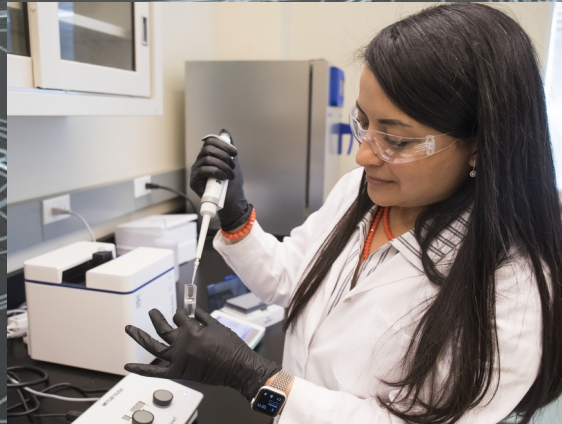
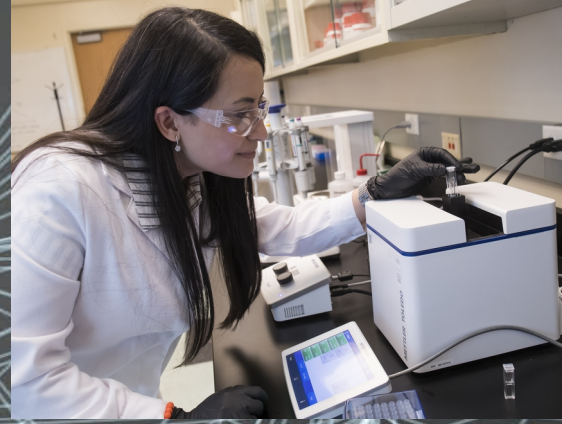
**Dr. Jeffrey
Miller**



COLLEGE OF
ENGINEERING, ARCHITECTURE AND TECHNOLOGY



THANK YOU!



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