Honors College Undergraduate Research Showcase

October 29, 2025

Oregon State University

A systematic review and risk assessment of polyhexamethylene guanidine phosphate (PHMG-p) and oligo(2-(2-ethoxy)ethoxyethyl guanidinium chloride (PGH)

June Pope
Environmental Science Major

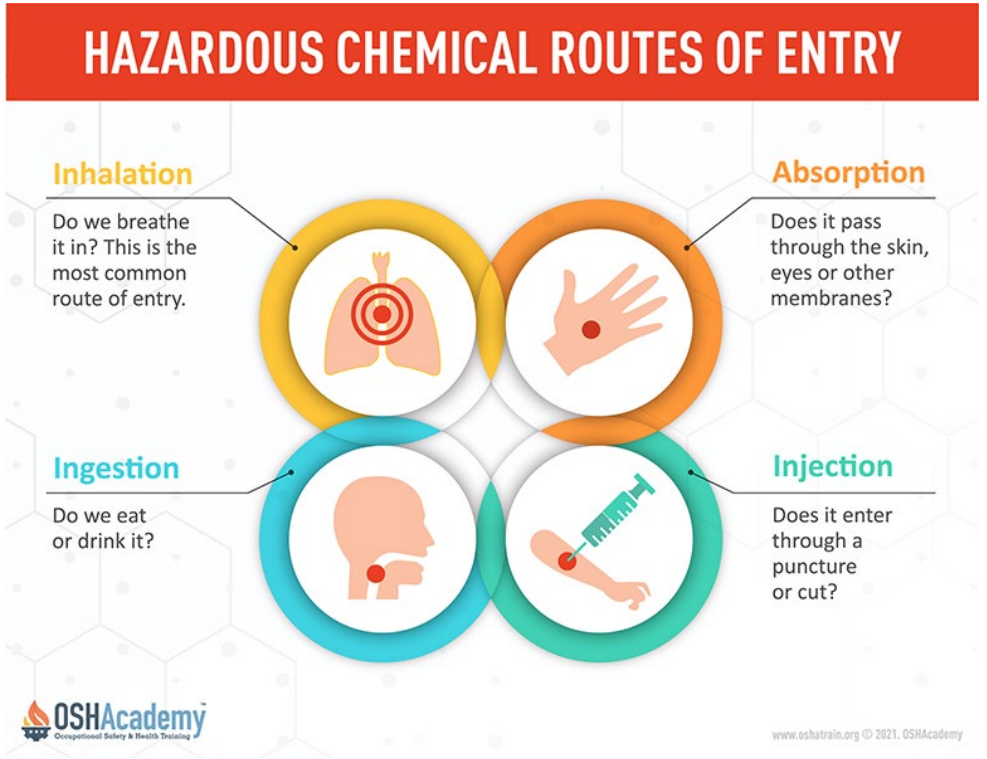
Dr. Lisa Truong

South Korean Humidifier Outbreak (2006-2011)

- Fatal lung injuries linked to PHMG-p & PGH
- Pre-2006 toxicology data suggested safety, but neglected inhalation testing

Research Goals

- Review toxicology data & analyze how it has evolved over time
- Compare global risk assessments (primarily: U.S., E.U., & South Korea)
- Identify gaps in regulation & data
- Promote public health education and communication worldwide, with emphasis on collaboration



Honors College Fall Undergraduate Research Showcase 2025

The Effects of Climate Change on Autism

Amrita Menon, BioHealth Sciences

Faculty Mentor: Dr. Sabine Huemer, School of Psychological Science

Oregon State University

Introduction

- According to the Intergovernmental Panel on Climate Change, climate change is defined as “any change in climate over time, whether due to natural variability or as a result of human activity,” (IPCC, 2018).
- Manifests as rising temperatures, shifting weather patterns, increased air pollution, and more frequent natural disasters such as earthquakes and wildfires.
- Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by deficits in social communication and the presence of restricted or repetitive behaviors and interests (American Psychological Association, 2013).
- For individuals with ASD, sudden changes in routine or environment, can worsen sensory sensitivities.
- Leads to increased levels of stress, anxiety, and behavioral difficulties.

Methods

- A literature search was conducted using Google Scholar to explore the relationship between climate change and autism.
- 29 journal articles selected because they either (1) focused specifically on autism spectrum disorder, (2) addressed climate change or climate-related distress as a primary topic, or (3) examined the impact of climate change or environmental events on individuals with autism.
- Excluded if they lacked a clear focus on either autism or climate factors, were not available in full-text, were not in English, or were not published in scholarly, reputable sources.
- Of the 29 selected articles, 28 were peer-reviewed.

Results

- Individuals with autism disproportionately vulnerable to climate-related disasters due to sensory sensitivities, difficulties with change and unfamiliar environments, and pre-existing medical or behavioral challenges.
- Natural disasters cause significant psychological distress in autistic children, including increases in repetitive behaviors, anxiety, PTSD symptoms, and social withdrawal, with lasting effects.
- Environmental stressors such as air pollution and extreme heat, linked to increased hospitalization rates and potential neurodevelopmental regression in children with ASD.

Future Directions and References/Acknowledgements

- Improved disaster preparedness protocols that focus on autism and special needs.
- Ongoing, routine, or autism-specific care during and after disasters by school nurses.
- Prioritization of sensory-friendly spaces and resources should be prioritized after natural disasters for those with autism.
- More resources and access to specialized services during and after disasters for families in rural, low-income, or underserved areas.

References:

Intergovernmental Panel on Climate Change. *(n.d) Glossary of Terms B*.

https://www.ipcc.ch/site/assets/uploads/2018/03/wg2TARannexB.pdf

American Psychological Association. (2013). Diagnosing and managing autism spectrum disorder (ASD).

https://www.apa.org/topics/autism-spectrum-disorder

Acknowledgements: I would like to thank my mentor, Dr. Huemer, for supporting me through this research and the Honors College for giving me this valuable opportunity to present my work.

Exploring Grief and Reckoning of a Terminal Cancer Diagnosis Through Patient Narratives

FALL 2025 HONORS COLLEGE UNDERGRADUATE RESEARCH SHOWCASE

Codi Wood

PRE-MED BIOCHEMISTRY AND MOLECULAR BIOLOGY

DR. COURTNEY CAMPBELL

Background

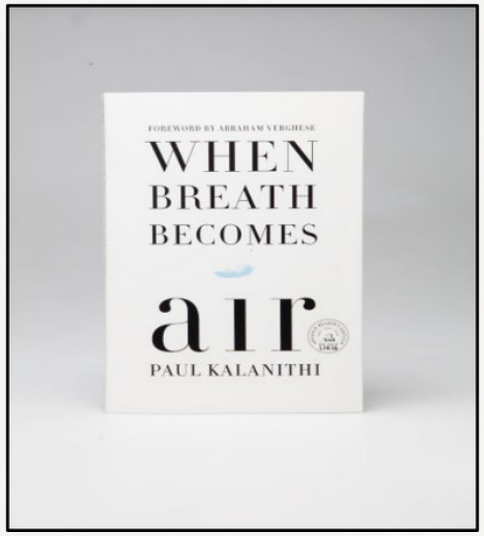
1. 38.9% of people will be diagnosed with cancer at some point in their life (NIH, 2025)
2. Absorbing patient’s stories increases empathy for patients (Kawega, et. al., 2023)
3. Sharing patient narratives improves patient experiences in a medical setting (Mebhard, et. al., 2025)

My Experience with Narratives

- Allowed me to understand the fears my mom could be feeling

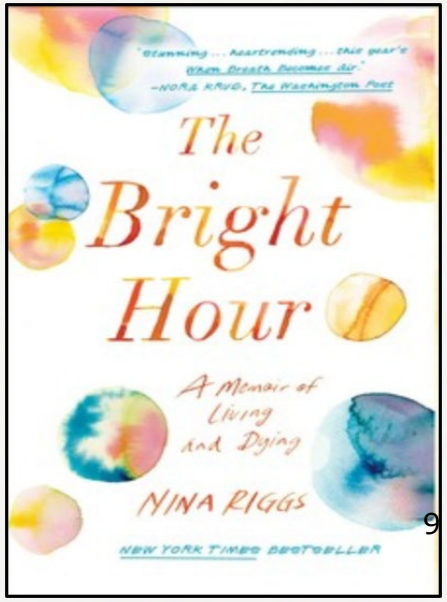
- Taught me what she may need when she couldn’t tell me herself

The Narratives



"I was awake again, alert to the world, but withered. I could see my bones against my skin, a living X-ray. At home, simply holding my head up was tiring. Lifting a glass of water required both hands. Reading was out of the question" (p. 192).

"I swallow bottles of pills and herbs and vitamins: I rub frankincense onto my feet to boost immunity and lower inflammation; I practice soft-belly breathing. The kids sign up for baseball and swim team. I nurse their fevers, sign their permission slips" (p. 245).



The Impact

- Through When Breath Becomes Air and The Bright Hour: A Memoir of Living and Dying providers are offered an opportunity to increase their empathy and understanding of patient experiences.

- Increased empathy could lead to improved patient outcomes, satisfaction, and more humanity being imbued into caregiving and medicine

References

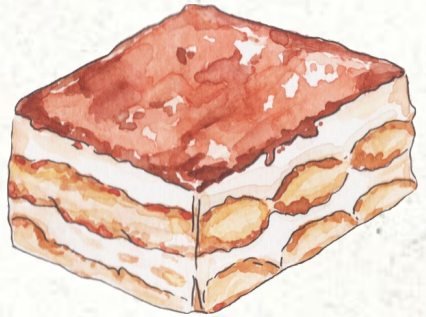
National Cancer Institute. (2025). Cancer Statistics, retrieved from: https://www.cancer.gov/about-cancer/understanding/statistics

Kagawa, Y., Ishikawa, H., Son, D., Okuhara, T., Okada, H., Ueno, H., Goto, E. Tsunezumi, A., & Kiuchi, T. (2023). Using Storytelling to Improve Medical Students' Empathy in Japan: A Pre-Post Study. BMC Medical Education, 23:67. https://doi.org/10.1186/s12909-023-04054-1

Nembardhard, M. I., Matta, S., Schaller, D., Lee, S., Y., Grob, R., Schlesinger, M. (2025). Learning from Patients: The Impact of Using Patients' Narratives on Patient Experience Scores. Health Care Management Review, 49(1):2-13. https://doi.org/:10.1097/HMR.0000000000000386

Fiona Dunlop

my life through food



How I chose my topic and found a mentor

My friends kept suggesting I write a cookbook but I dismissed them because I didn't think I actually could. Once I thought about it more I realized that it would be a really fun and fulfilling project.

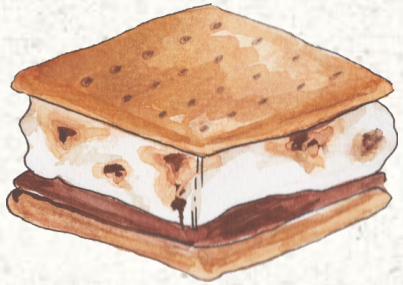
I found my thesis mentor through working in the Honors College office. A coworker was going through seminar requests and pointed out one about writing cookbooks and their cultural importance. I reached out to the instructor who had sent in the request and that's how I started working with Liz Delf.

Deciding on recipes

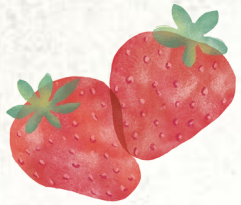
I decided to pick recipes from my life, things that I have emotional connections to and know how to make. I spent about a week picking out potential recipes to include.

recipe testing

I did the majority of my recipe testing over the summer and plan on completing it this term. So far I've tested eleven recipes and plan on testing at least four more before going back and remaking some things.

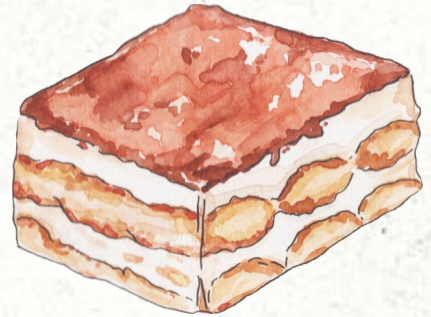


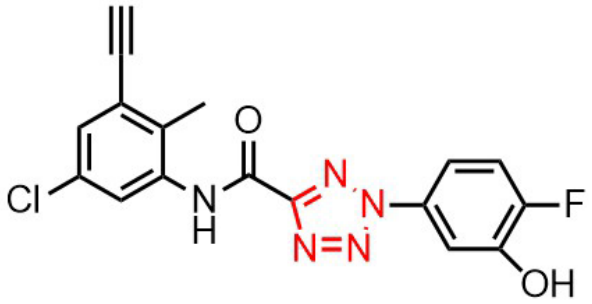
Personal essays



I’ve also been writing personal essays to go along with the recipes, trying to weave in stories about my family and my life to show why each of the recipes is important to me. I’ve mainly been working on these this term.

Thank You



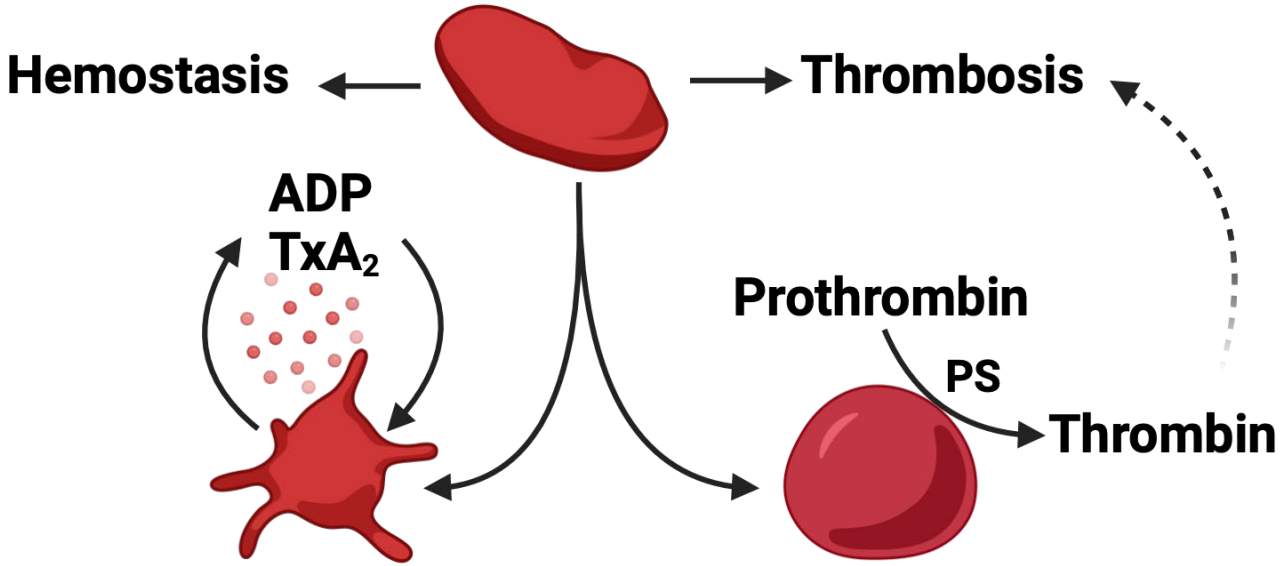


Target Identification of a Tetrazole-based mPTP Inhibitor

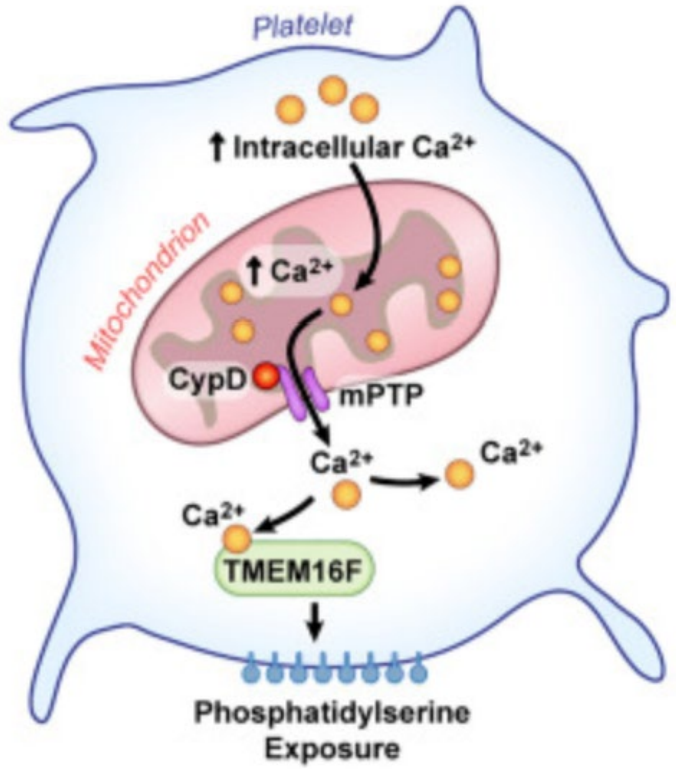
Jordan Sandler - 4th Year Bioengineering Major

Thesis Mentor: Joseph E. Aslan, Ph.D., FAHA

Procoagulant Platelet Generation through mPTP

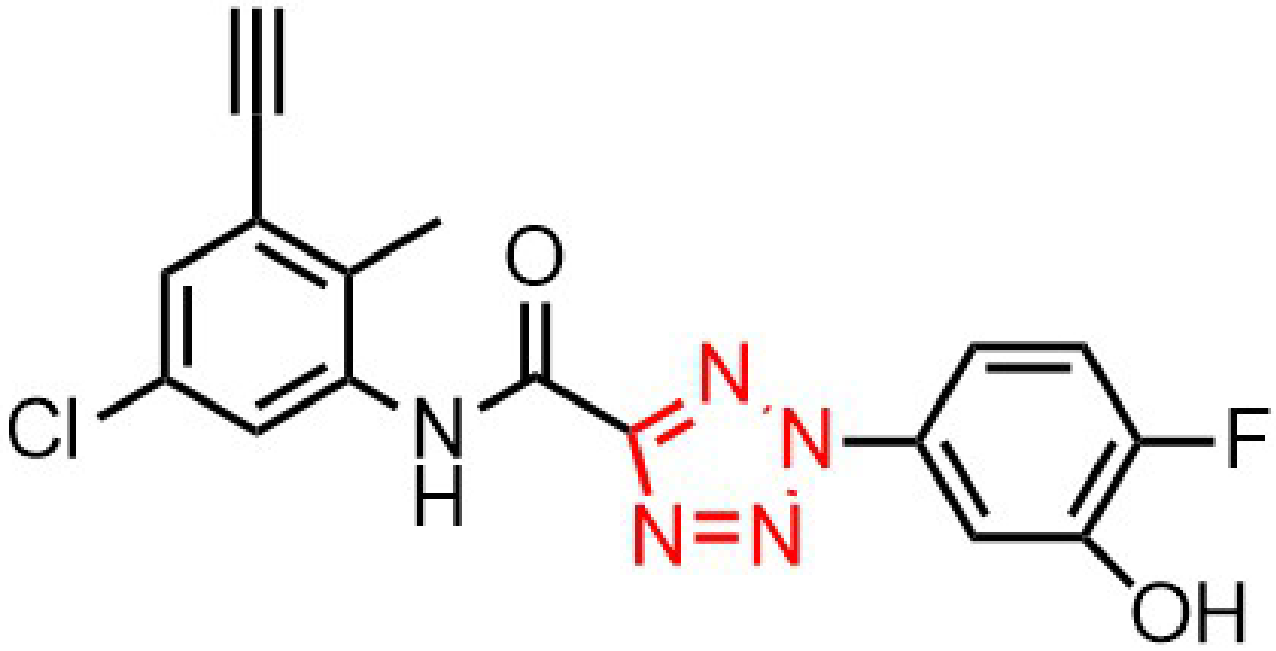


Critical components in the formation of pathological thrombus

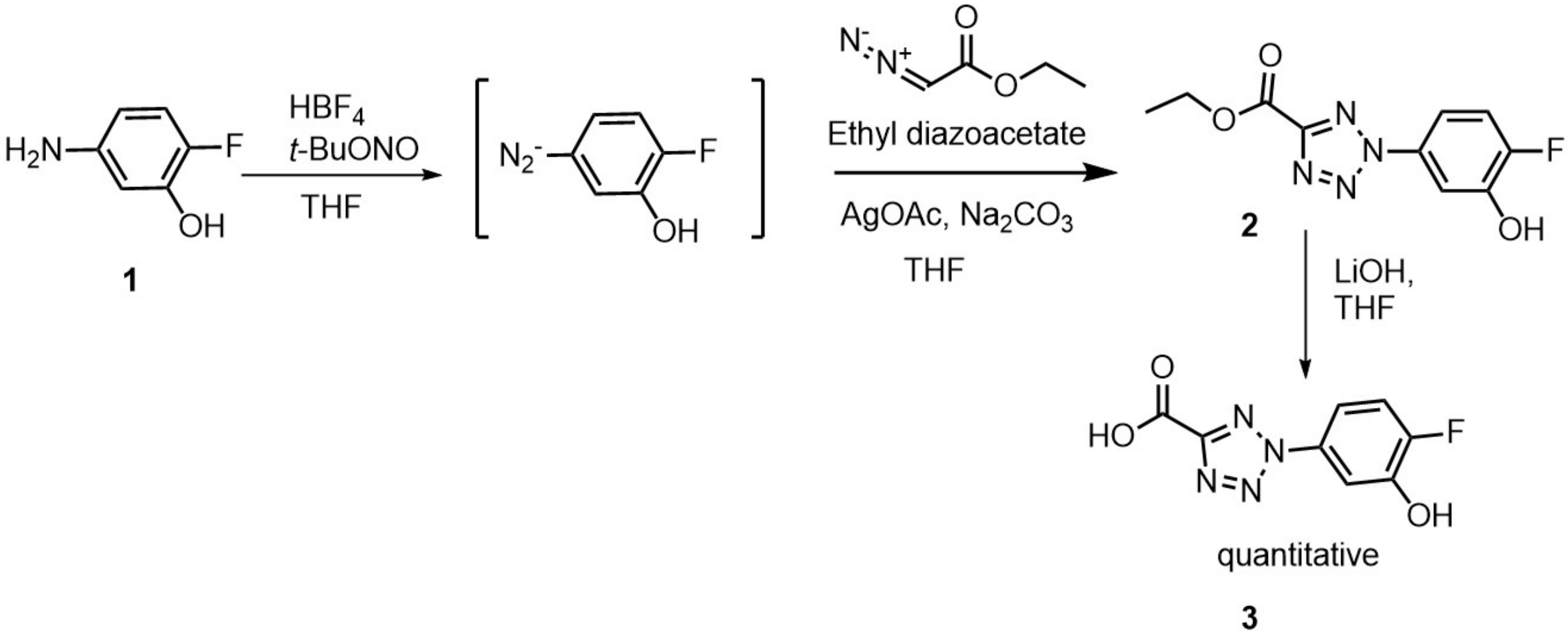


Denorme & Campbell, Am J Physiol Cell Physiol (2022)

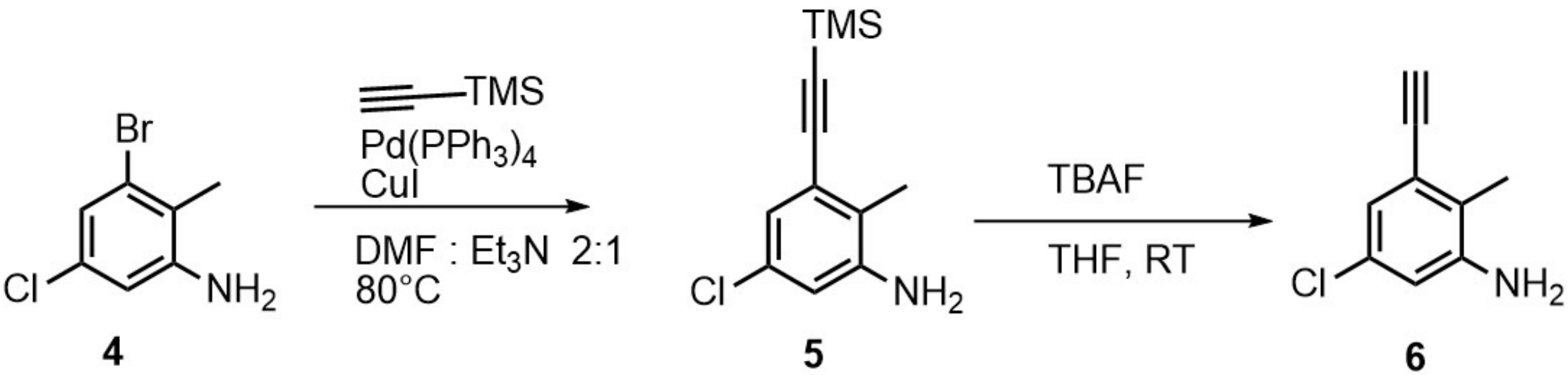
Tetrazole-based mPTP Inhibitor SS-1406



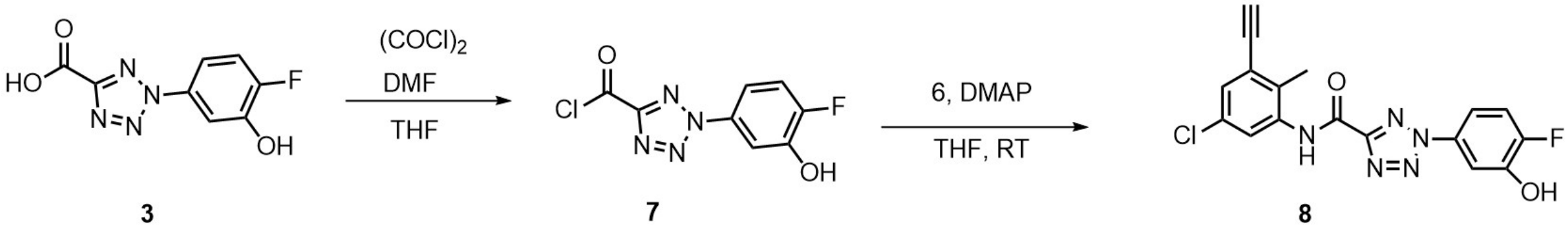
Synthesis of Acid Scaffold



Synthesis of Amine Scaffold



Synthesis of Amide Scaffold



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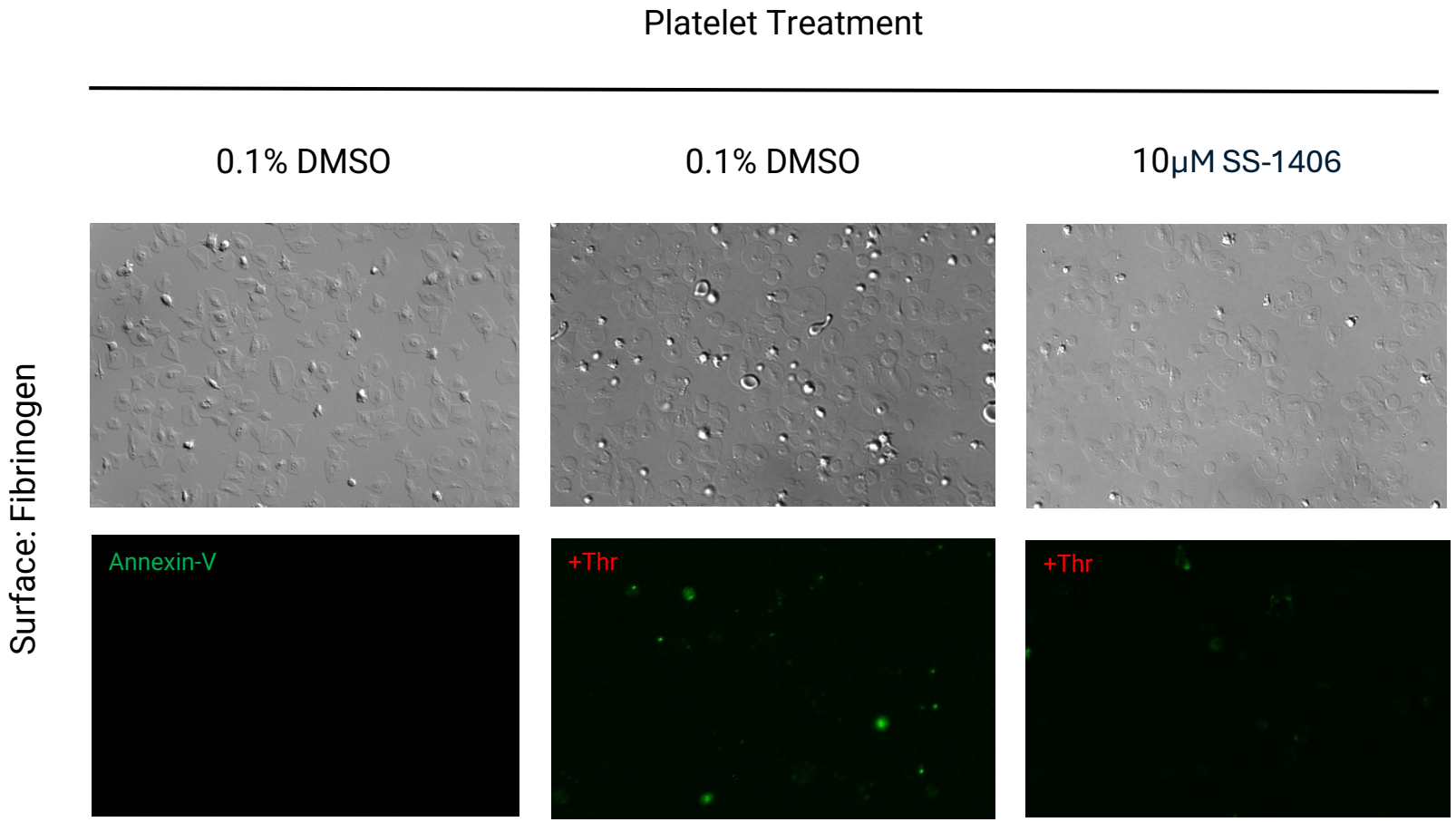
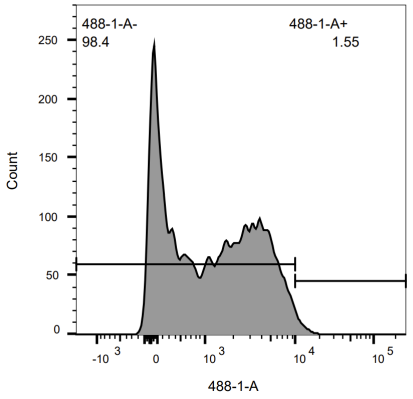
Live Cell Imaging Assay

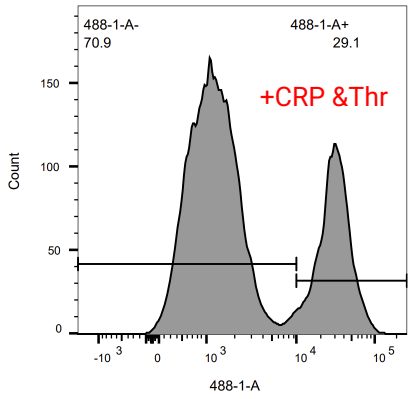


Flow Cytometry Assay

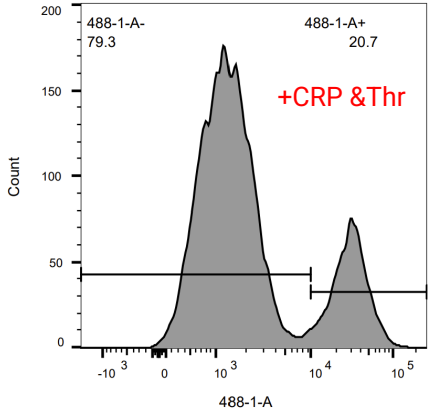
0.1% DMSO



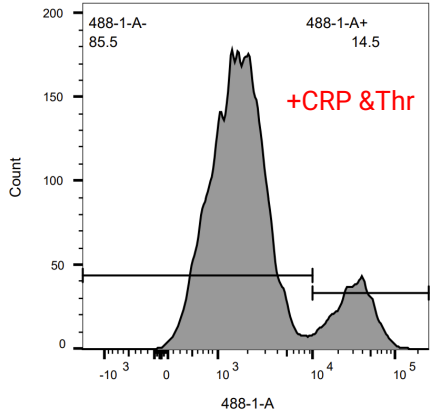
0.1% DMSO



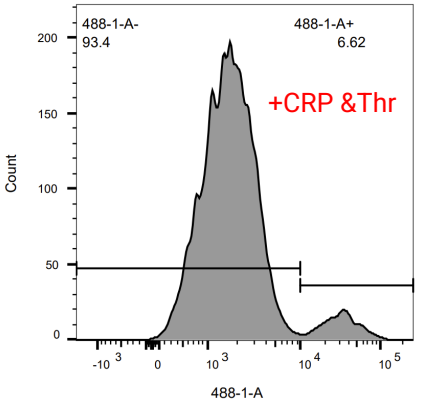
10 μM SS-1406



20 μM SS-1406



50 μM SS-1406



Questions?

Optimization and Characterization of Gold Nanoparticle Hydrogels for Imaging Applications

Honors College Undergraduate Showcase

Chester (CJ) Lao

Mentor: Dr. Binata Joddar

HBS ChE 2025

About Me!

Oregon State University
College of Engineering

- Honor's Chemical Engineering
- Tentative Graduation: Fall 2025
- Currently working at Genentech as a manufacturing asset engineer
  - Finishing up Honor's Thesis concurrently

Fig. 1: Me posing in front of the Gleeson elevator

Fig. 2: Genentech in Hillsboro, OR

Project Overview

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College of Engineering

- High water content of hydrogels makes the material difficult to image for defects (1)
- Gold nanoparticles (AuNPs) are largely nontoxic, and have demonstrated potential as a contrasting agent (2)
- Various nanoparticle characteristics (e.g. size, concentration, functional group) can influence AuNP-hydrogel properties
- A need exists to analyze properties of these hydrogels
  - FTIR (Characterization)
  - UV-Vis (Size confirmation)
  - Live-Dead Assay (Biocompability)
  - Nanoindentation (Elastic Modulus)

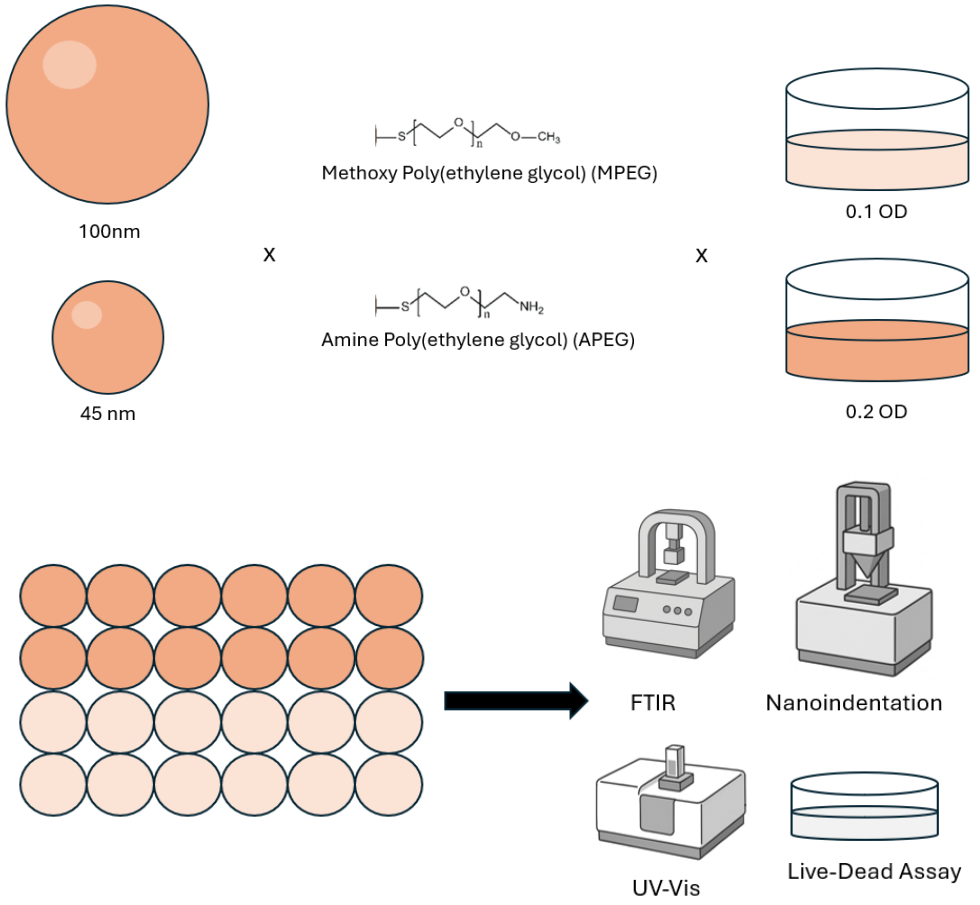

Fig. 3: Experimental plan for nanoparticle samples. All samples in triplicates are sent through FTIR, nanoindentation, SEM, UV-Vis, and Live-Dead Assay.

Results - Highlights

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College of Engineering

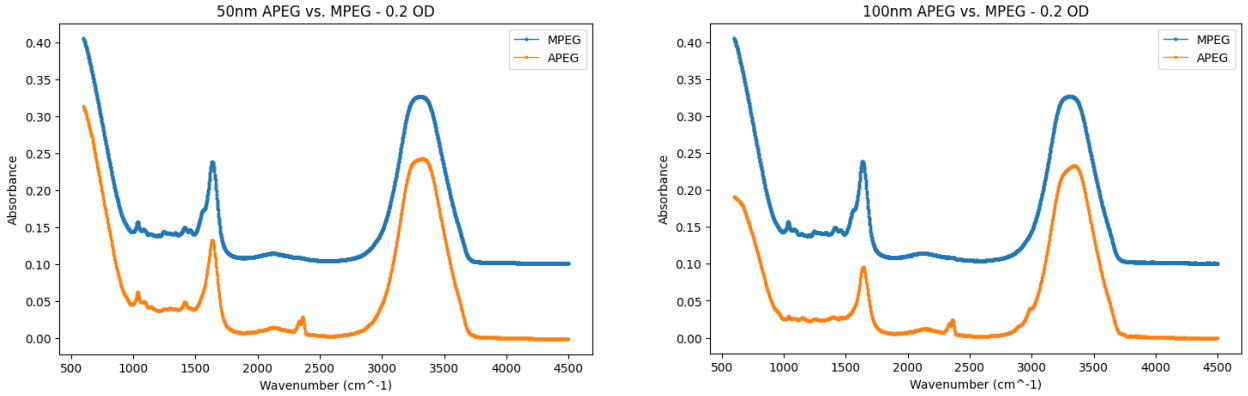


Fig. 4 FTIR Readings for 50nm and 100nm nanoparticles at 0.2 optical density. MPEG(blue) vs APEG(orange) functional groups attached to gold particles mixed with 5% alginate 7% gelatin hydrogel

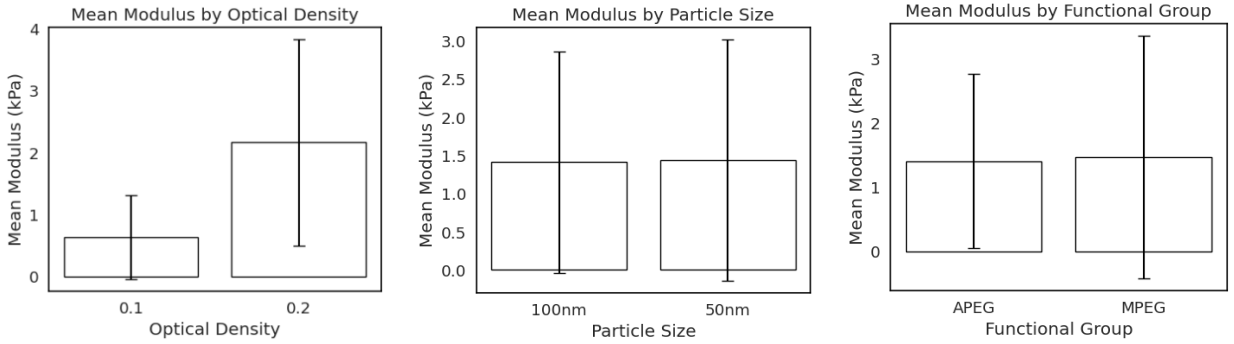
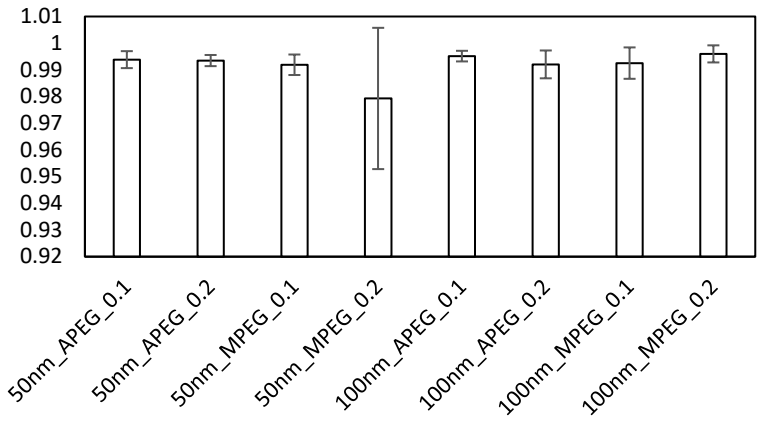


Fig. 5 Nanoindentation results of mean modulus by particle size. R^2 values less than 0, control samples, and modulus greater than 15 Kpa were filtered out to rule out any outliers.



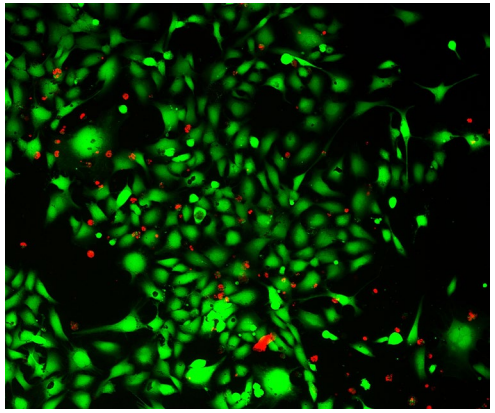


Fig. 6: Live dead results. Cells were mixed with appropriate amounts of nanoparticles and incubated for 6 hours at ambient temperature and then imaged under a microscope. ImageJ was used to count density of live/dead cells.

Lessons Learned

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- Difficulties creating consistent hydrogel surfaces
- Nanoparticle concentrations likely not high enough to see noticeable cytotoxicity
- Imaging needs to be performed to measure nanoparticle dispersion and overall contrast

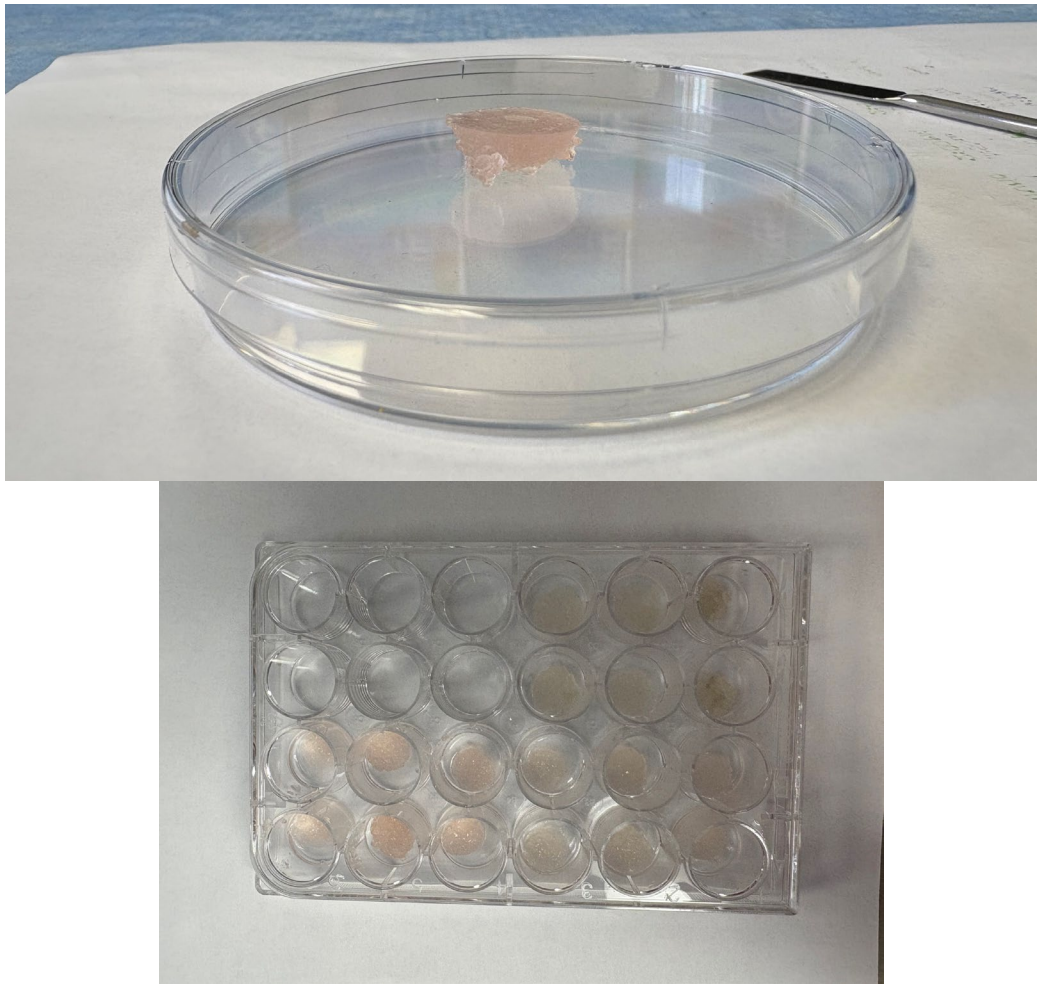

Fig. 7: Various hydrogel samples

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Sources

1. Huang, Xiaohua, and Mostafa A. El-Sayed. “Gold Nanoparticles: Optical Properties and Implementations in Cancer Diagnosis and Photothermal Therapy.” Journal of Advanced Research, vol. 1, no. 1, Jan. 2010, pp. 13–28. ScienceDirect, https://doi.org/10.1016/j.jare.2010.02.002.

2. Ramirez, Salma P., et al. “Microcomputed Tomography for the Microstructure Evaluation of 3D Bioprinted Scaffolds.” ACS Applied Bio Materials, vol. 7, no. 12, Dec. 2024, pp. 7799–808. ACS Publications, https://doi.org/10.1021/acsabm.3c00621.

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Thank You to all presenters and attendees

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