EMMY ROSE FRANCEK

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EDUCATION

2021-2023 M.S. in Biomedical Engineering at the University of Oklahoma (OU) Stephenson School of Biomedical Engineering; Norman, OK
- GPA: 4.00 on 4.00 scale

2018-2022 B.S. in Biomedical Engineering at the University of Oklahoma Stephenson School of Biomedical Engineering; Norman, OK
- GPA: 3.95 on 4.00 scale, *summa cum laude*

2014-2018 Sewickley Academy; Sewickley, PA
- GPA: 3.96 on 4.00 scale

HONORS AND AWARDS

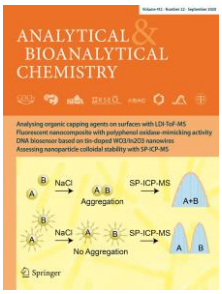
2022	OU Stephenson School of Biomedical Engineering Outstanding Senior	Norman, OK
2022	OU Honors College Undergraduate Research Day Silver Medal in Biomedical Engineering	Norman, OK
2022	OU Letzeiser Honor List	Norman, OK
2022	OU Campus Life Award	Norman, OK
2021	OU Gallogly College of Engineering Outstanding Senior	Norman, OK
2021-Present	OU Undergraduate Research Opportunities Program Fellowship	Norman, OK
2021	OU Honors Research Assistant Program Fellowship	Norman, OK
2021	Tau Beta Pi Scholarship Recipient	Norman, OK
2021	OU Board of Regents' Award for Outstanding Junior	Norman, OK
2020	OU Stephenson School of Biomedical Engineering Outstanding Sophomore	Norman, OK
2019-Present	OU Gallogly College of Engineering Dean's List	Norman, OK

2019-Present	Member of Oklahoma Alpha Chapter of Tau Beta Pi	Norman, OK
2018-Present	OU President's Honor Roll	Norman, OK
2018	United States Figure Skating Association Gold Level Graduating Senior	Colorado Springs, CO
2018	Sewickley Academy Cum Laude Society Member	Sewickley, PA
2018	National Merit Scholar	Sewickley, PA
2010-2019	4x United States Figure Skating Association Gold Medalist	Colorado Springs, CO

PUBLICATION RECOGNITIONS AND INTERVIEWS

2021 Podcast Interview, Sewickley Academy Alumni Conversations; December 2021.
E. R. Francek, K. Long, "Emmy Francek '18."
https://open.spotify.com/episode/6EeOOczHygPJXIBkUJ4UoZ?si=a0990b3120b44dd9

2020 Journal cover, *Analytical and Bioanalytical Chemistry*; Volume 412; Issue 22; September 2020.
N. D. Donahue, **E. R. Francek**, E. Kiyotake, E. E. Thomas, W. Yang, L. Wang, M. S. Detamore, S. Wilhelm, "Assessing nanoparticle colloidal stability with Single-Particle Inductively Coupled Plasma Mass Spectrometry (SP-ICP-MS)." *Analytical and Bioanalytical Chemistry*, 2020, 412, 5205-5216.DOI: 10.1007/s00216-020-02783-6



2018 Article for the Sewickley Herald regarding United States Figure Skating Gold Level Graduation Seniors Award.
Web: https://apnews.com/article/ba4fba2e34624473b304c7308b6408ca

2016 Sewickley Herald Article following figure skating accomplishments.
Web: https://archive.triblive.com/news/sewickley-teen-excels-at-figure-skating/

PUBLICATION OVERVIEW

Accessed from Google Scholar on 8/4/2022
Citations: 59
H index: 4
I10-index: 3
Google Scholar: https://scholar.google.com/citations?user=X9gdUHUAAAAJ&hl=en
ORCID: https://orcid.org/0000-0001-8850-3582

PUBLICATIONS

In Preparation

7. **E. R. Francek**, W. Gachunga, S. Wilhelm, "Small Molecule Mechanisms of M1-like Macrophage Polarization." 2022, in preparation.

6. N. D. Donahue, E. A. Vance, **E. R. Francek**, S. Wilhelm, "Synthesis, characterization, and cellular toxicity evaluation of chloroquine encapsulating liposomes." 2022, in preparation.

Published/accepted

5. W. Yang, L. Wang, M. Fang, N. Donahue, V. Sheth, A. M. Holden, A. Frickenstein, E. M. Mettenbrink, T. A. Schwemley. **E. R. Francek**, M. Haddad, N. Hossen, P. Mukherjee, S. Wu, D. Green, P. L. DeAngelis, S. Wilhelm, "Nanoparticle Surface Engineering with Heparosan Reduces Protein Adsorption and Enhances Cellular Uptake." *Nano Letters*, 2022, 22, 5, 2103-2111.
   DOI: 10.1021/acs.nanolett.2c00349

4. N. D. Donahue, S. Kanapilly, C. Stephan, C. Marlin, **E. R. Francek**, M. Haddad, J. Guthridge, S. Wilhelm, "Quantifying Chemical Composition and Reaction Kinetics of Individual Colloidally Dispersed Nanoparticles." *Nano Letters*, 2021.
   DOI: 10.1021/acs.nanolett.1c03752

3. Y. Zhang, C. K. Elechalawar, M. N. Hossen, **E. R. Francek**, A. Dey, S. Wilhelm, R. Bhattacharya, P. Mukherjee, "Gold nanoparticles inhibit activation of cancer-associated fibroblasts by disrupting communication from tumor and microenvironmental cells." *Bioactive Materials*, 2021, 6, 326-332.
   DOI: 10.1016/j.bioactmat.2020.08.009

2. N. D. Donahue, **E. R. Francek**, E. Kiyotake, E. E. Thomas, W. Yang, L. Wang, M. S. Detamore, S. Wilhelm, "Assessing nanoparticle colloidal stability with Single-Particle Inductively Coupled Plasma Mass Spectrometry (SP-ICP-MS)." *Analytical and Bioanalytical Chemistry*, 2020, 412, 5205-5216.
   DOI: 10.1007/s00216-020-02783-6
   Highlighted on journal cover page (*Analytical and Bioanalytical Chemistry*; Volume: 412; Issue: 22; September 2020).

1. J. C. Lee, N. D. Donahue, A. S. Mao, A. Karim, M. Komarneni, E. E. Thomas, **E. R. Francek**, W. Yang, S. Wilhelm, "Exploring maleimide-based nanoparticle surface engineering to control cellular interactions." *ACS Applied Nano Materials*, 2020, 3, 3, 2421-2429.
   DOI: 10.1021/acsanm.9b02541

RESEARCH

2021-2022	Lead Design Engineer on a Model of the Glioblastoma (GBM) Microenvironment for the OU Stephenson School of Biomedical Engineering • Coordinated a team of engineers to design and create a GBM model over the course of a year • Led weekly meetings • Collaborated with physician-scientists at the OU Stephenson Cancer Center • Wrote a comprehensive 130-page design report	Norman, OK

- In the process of filing patent application

2021	Pediatric Emergency Medicine Research Associate with the Oklahoma Children's Hospital at the University of Oklahoma Health Science Center • Screened pediatric patients for active site-specific and nationwide studies • Enrolled pediatric patients in various clinical studies • Learned basic Pediatric Emergency Medicine procedures • Educated on Informed Consent practices	Oklahoma City, OK
2019-Present	Oncological Nanoparticle Research with the University of Oklahoma • Synthesized organic and inorganic nanoparticles • Characterized nanoparticles • Operated essential biomedical engineering equipment • Designed experiments to enhance understanding of nanoparticle-macrophage kinetics • Worked with immortalized cancer and immune cell lines using proper sterile technique • Contributed as co-author to three peer-reviewed original research publications	Norman, OK
2019-Present	Cryogenic Transmission Electron Microscopy Research with the University of Oklahoma • Worked on optimizing sample preparation and imaging • Obtained images for NSF grant proposal • Obtained images of nanomaterials for upcoming publications • Manuscript is in preparation: Donahue, Vance, **Francek**, Wilhelm, "Synthesis, characterization, and cellular toxicity evaluation of chloroquine encapsulating liposomes." 2021, in preparation.	Norman, OK
2018	Biofilm Research with the University of Pittsburgh; Pittsburgh, PA • Prepared *E. coli* samples • Inserted plasmids into *E. coli* samples • Recorded biofilm populations over time	Pittsburgh, PA

LEADERSHIP

2021 — Biomedical Engineering Society Vice President — Norman, OK
- Facilitated Chapter Meetings
- Organized social events
- Planned STEM outreach events

2020-Present — Biomedical Engineering Society Student Mentor — Norman, OK
- Mentored two biomedical engineering freshman in their engineering careers
- Supported the mentees through monthly check-ins
- Built relationships with mentees

2019-Present — BE4NANO (Bio-nanotechnology Engagement for Native Americans in Oklahoma) — Norman, OK
- Helped found the organization
- Created educational materials for 3rd-12th grade students representing communities historically underrepresented in STEM
- Prepared nanoparticle synthesis supplies and student recruitment materials
- Web: https://www.wilhelm-lab.com/outreach/

2018-2019 — Couch Center Resident Student Association Director of Advocacy — Norman, OK
- Organized educational and fun events for 1500+ students
- Advocated for student needs within the building
- Implemented wheelchair accessibility and recycling

COMMUNITY ENGAGEMENT AND SERVICE

2021 — University of Oklahoma Figure Skating Club — Norman, OK
- Taught new figure skaters basic skills
- Shared passion for the sport with other like-minded individuals

2021 — University of Oklahoma LIMITLESS!: Interdisciplinary fitness organization — Norman, OK
- Attended fitness classes (HIIT, kickboxing, Zumba, etc.)

2019 — Traverse Area Community Sailing Volunteer Instructor
- Taught basic skills to new sailors
- Assisted in Adaptive Sailing Programs for special

needs sailors (veterans, senior citizens, individuals with physical and/or cognitive delays, etc.)

2019-Present	University of Oklahoma Hip Hop Dance Club • Taught choreographed hip hop dances to members of the OU community • Learned dances and stayed active	Norman, OK
2018-Present	University of Oklahoma Medical Ethics and Issues Discussion Panel • Discussed and debated medical ethics case studies • Attended conversations with physicians regarding ethical concerns	Norman, OK
2018-Present	University of Oklahoma Housing Center Student Association • Planned events for individuals in the housing community • Advocated for housing concerns • Proposed and voted upon bills to help the housing community	Norman, OK
2018-Present	University of Oklahoma Couch Resident Student Association • Planned educational and fun events for members of the Couch center community • Solved accessibility issues within the building	Norman, OK
2018-Present	University of Oklahoma Honors Student Association • Attended Honors-specific reading groups • Participated in Honors events like Trivia Night	Norman, OK
2018-Present	University of Oklahoma OK Sailing Club • Taught new sailors basic skills • Shared a passion for the sport with like-minded individuals	Norman, OK

PROFESSIONAL MEMBERSHIPS

2020-Present	Oklahoma Microscopy Society
2020-Present	Texas Society of Microscopy
2019-Present	American Chemical Society
2018-Present	Biomedical Engineering Society

2018-2021	Society of Women Engineers

EMPLOYMENT

2022	University of Oklahoma Stephenson School of Biomedical Engineering Teaching Assistant	Norman, OK
2021	University of Oklahoma Stephenson School of Biomedical Engineering Grader	Norman, OK
2021	Wilhelm Lab Assistant Researcher	Norman, OK
2019-2020	lululemon Educator	Traverse City, MI

LABORATORY SKILLS

Confocal Microscopy
Cryo-TEM Preparation
Dynamic Light Scattering (DLS)
Electron Microscopy Preparation
Fluorometry
Gel Electrophoresis
Hemocytometer
Inductively Coupled Plasma Mass
Intravenous Tail Vein Injections
Light Microscopy
Microfluidics
Mouse Necropsy
Nanoparticle Synthesis
Optical Microscopy
Pre-clinical Animal Models
Spectrometry (ICP-MS)
Sterile Cell Culture Techniques
Tail Vein Blood Collection
Transmission Electron Microscopy (TEM)
UV-VIS Spectrophotometry

SOFTWARE SKILLS

Adobe Illustrator
Image Analysis (FIJI, ImageJ)
MATLAB
Prism GraphPad
Python
SOLIDWORKS

LICENSES AND CERTIFICATION

Oct 2021-Oct 2023	American Heart Association Basic Life Support (BLS) • Credential ID 215416260226
Aug 2021-Aug 2025	CITI Program Biomedical Responsible Conduct of Research • Credential ID 44338417
Aug 2021-Aug 2024	CITI Program Good Clinical Practice • Credential ID 44338418
Aug 2021- Aug 2024	CITI Program Group 1 Biomedical Research Investigators and Key Personnel • Credential ID 44338416