# Spenser R. Brown Cox

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## EDUCATION

**Ph.D. in Chemical Engineering** Dec. 2023
*The University of Alabama- Tuscaloosa, AL* Dec. 2019
**Master of Science in Chemical Engineering**
*The University of Alabama- Tuscaloosa, AL* Dec. 2015
**Bachelor of Science in Chemical Engineering**
*The University of Alabama- Tuscaloosa, AL*

## AWARDS

AIChE The Leadership Equity in Engineering (LEE) Program Member Jul. 2024-Feb. 2025
AIChE John C. Chen Young Professional Leadership Award Oct. 2023
Graduate Assistance in Areas of National Need Fellow Aug. 2020-Aug. 2023
ACS BIOT W.H. Peterson Award for Best Oral Presentation Mar. 2022
The University of Alabama Three Minute Thesis- People's Choice Nov. 2021
AIChE Women in Chemical Engineering Travel Award Oct. 2021
Outstanding Graduate Student Service to the Department Award Apr. 2021
AL Louis Stokes Alliance for Minority Participation Bridge to the Doctorate Fellow Jan. 2018-Aug. 2020

## EXPERIENCE

**Postdoctoral Research Associate** Apr. 2024-Dec. 2023
*Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN*

- Biopreparedness Research Virtual Environment (BraVE) Project
  - *Optical imaging of microbes on abiotic surfaces*
- Method development of bacterial samples on functionalized abiotic surfaces for observation via confocal, atomic force, and cryogenic electron microscopy.

**Graduate Researcher** Jul. 2018-Dec. 2023
*Y. John Kim Lab, The University of Alabama, Tuscaloosa, AL*

- Designed, executed, analyzed, and present (written and oral) experiments to support thesis project.
  - *The Relationship between Stemness and Fluid Shear Stress in Breast Cancer Metastasis*
- Managed lab by overseeing experimental design, execution, analysis, and presentation for 3 undergraduate students.
- Managed laboratory equipment performance, usage, and maintenance.
  - Se3 sorter, Accuri flow cytometer, Beckman-Coulter high-speed centrifuge
- Culture mammalian cells (epithelial, cancer, cancer stem cell) for a variety of research projects.
- Effectively utilized sophisticated microscopy techniques to generate data on the effects of fluid shear stress on cell biology and extracellular vesicles.
  - Confocal, transmission electron microscopy, scanning electron microscopy
- Analyzed receptor and gene expression impacts of fluid shear stress on breast cancer cells through flow cytometry and quantitative real-time polymerase chain reaction (qRT-PCR).

**Trivia Jockey** Jan. 2017-Dec. 2023
*Challenge Entertainment, Tuscaloosa, AL*

- Engaged in community involvement by presenting an interactive trivia game.
- Developed relationships with local businesses and residents to promote participation.

- Practiced public speaking, time management and conflict resolution skills.

## SERVICES

**AIChE Young Professionals Committee, Early Career Community** Jan. 2021-present

*Early Career Community Development Committee*

- Contribute to outlining value proposition, establishing member benefits, marketing of ECC.

*Spring 2023 Programming Chair*

- Provided in-person programming to educate current and prospective YPC members.

*Recruitment and Retention Subcommittee*

- Provided virtual programming to engage current and prospective YPC members.
- Session moderator at AIChE Annual Meeting.

**Tide Together Peer Mentoring Program (Univ. of AL)** Aug. 2020-May 2022

*Mentor*

- Supported first-year graduate students through year one.

**Graduate Student Association (Univ. of AL)** Aug. 2019-Aug. 2020

*Departmental Delegate*

- Represented chemical engineering graduate students' interests to the Graduate Student Association.
- Communicated campus updates and events from the Graduate Student Association and Graduate School to all chemical engineering graduate students.
- Coordinated schedule for prospective students.

**American Institute of Chemical Engineers (Univ. of AL Chapter)** Aug. 2014-Dec. 2015

*Publicity Chair*

- Liaised with company representatives to develop relationships with AIChE.
- Worked with a team to anticipate needs of members to provide communication to highlight field and career opportunities.
- Volunteered in E-Day demonstrations to market chemical engineering.

*Outreach Coordinator*

- Pioneered and implemented fundraising initiative, strengthened community involvement.
- Volunteered at middle and high schools to increase interest in STEM fields.
- Organized, promoted, and executed social and networking events.

**Mentor UPP, Undergraduate Peer Partnering (Univ. of AL)** Aug.-Dec. 2015

*Undergraduate Mentor*

- Mentored freshman students on college life, advised in course selection.

## SKILLS

**Lab Management**

- Managed lab participation and communication in 5 regular collaborations

**Mammalian cell culture**

- Human epithelial cells, cancer cells, cancer stem cells

**Bacterial cell culture**

- *Pantoea* sp. YR343, *E. coli*

**Molecular Biology Analytical Instruments**

- Confocal Microscopy:
  - Nikon C2+ Confocal Scanning Laser Microscope
  - Zeiss LSM 710 Confocal Scanning Laser Microscope
  - Zeiss LSM 980 Confocal Scanning Laser Microscope
- BioTek Cytation5 Imaging Reader
- Transmission Electron Microscopy: Tecnai 200 TEM

- Scanning Electron Microscopy: Apreo FE-SEM
- Atomic Force Microscopy
- Flow Cytometry:
  - Bio-Rad S3e Cell Sorter
  - BD Accuri C6 flow cytometer
- qRT-PCR: Thermo Fisher Scientific StepOne Real-Time PCR System
- DNA/RNA extraction and quantification
- Drug screening assays

**Microsoft Office**
**Oral and Written Communication**
**Teamwork**

## TEACHING EXPERIENCE

**Biochemical Engineering** Fall 2022
*The University of Alabama, Tuscaloosa, AL*
**Transport Phenomena** Summer 2019
*University College Dublin, Dublin, Ireland*
**Stem Cell Bioengineering** Summer 2019
*University College Dublin, Dublin, Ireland*

## PUBLICATIONS

1. **Spenser R. Brown**, Margaret E. Radcliffe, Joseph T. Danner, Wilmer J. Andújar Cruz, Kimberly H. Lackey, Han-A Park, Steven T. Weinman, Yonghyun Kim. Extracellular Vesicle-Mediated Modulation of Stem-like Phenotype in Breast Cancer Cells under Fluid Shear Stress. *Biomolecules.* 2024.
2. Shomit Mansur, Shahriar Habib, Mikayla Hawkins, **Spenser R. Brown**, Steven Weinman, Yuping Bao. Preparation of Nanoparticle-loaded Exosomes using Direct Flow Filtration. *Pharmaceutics*. 2023.
3. Yifei Sun, Sanjit Das, **Spenser R. Brown**, Emily R. Blevins, Fengrui Qu, Nicholas A. Ward, Shawn Aiden Gregory, Chance M. Boudreaux, Yonghyun Kim, Elizabeth T. Papish. Ruthenium pincer complexes for light activated toxicity: Lipophilic groups enhance toxicity. *Journal of Inorganic Biochemistry*. 2023.
4. Han-A Park, **Spenser R. Brown**, Joseph Jansen, Tracie Dunn, Madison Scott, Nelli Mnatsakanyan, Elizabeth A. Jonas, Yonghyun Kim. Fluid shear stress enhances proliferation of breast cancer cells via downregulation of the c-subunit of the $F_1F_O$ ATP synthase. *Biochemical and Biophysical Research Communications*. 2022.
5. **Spenser R. Brown,** Juliana C. Bates, Alexandra D. Avera, and Yonghyun Kim. Relationship Between Stemness, Reactive Oxygen Species, and Epithelial-to-Mesenchymal Transition in Model Circulating Tumor Cells. *Cells Tissues Organs*. 2021.
6. Olaitan Oladipupo, **Spenser R. Brown**, Robert W. Lamb, Jessica L. Gray, Colin G. Cameron, Alexa R. DeRegnaucourt, Nicholas A. Ward, James Fletcher Hall, Yifei Xu, Courtney M. Petersen, Fengrui Qu, Ambar B. Shrestha, Matthew K. Thompson, Marco Bonizzoni, Charles Edwin Webster, Sherri A. McFarland, Yonghyun Kum, Elizabeth T. Papish. Light-responsive and Protic Ruthenium Compounds Bearing Bathophenanthroline and Dihydroxybipyridine Ligands Achieve Nanomolar Toxicity towards Breast Cancer Cells. *Photochemistry and Photobiology.* 2021.
7. Han-A Park, **Spenser R. Brown**, and Yonghyun Kim. Cellular Mechanisms of Circulating Tumor Cells During Breast Cancer Metastasis. *International Journal of Molecular Sciences.* 2020.

## PRESENTATIONS

1. **Brown SR,** Kapperman, ME, Danner, JT, Park, HA, Weinman, ST, Kim Y. "Role of Extracellular Vesicles in Maintaining Stemness in Breast Cancer Metastasis." Poster. American Institute of Chemical Engineers (AIChE) 2023 Annual Meeting, Orlando, FL (August 5-10, 2023).

*Second Place in Food, Pharmaceutical & Bioengineering Division Poster Competition*

2. **Brown SR,** Kapperman, ME, Danner, JT, Park, HA, Weinman, ST, Kim Y. "Role of Extracellular Vesicles in Maintaining Stemness in Breast Cancer Metastasis." Poster. American Chemical Society (ACS) 2023 Annual Meeting, San Francisco, CA (August 13-17, 2023).
3. **Brown SR,** Bates JC, Avera AD, Kim Y. "Effects of Fluid Shear Stress on Reactive Oxygen Species, Stemness, and Epithelial-to-Mesenchymal Transition." Pfizer Biotech Connect Symposium, Pfizer Inc. Virtual meeting (April 19, 2022).
4. Sun Y, Das S, Oladipupo OE, Brown SR, Papish ET, and Kim Y. "Anti-Cancer Effects of Ruthenium CNC Pincer Complexes." Undergraduate Research & Creative Activity (URCA) Conference, The University of Alabama, Tuscaloosa, AL (April 4, 2022).
5. **Brown SR,** Bates JC, Avera AD, Kim Y. "Effects of Fluid Shear Stress on Reactive Oxygen Species, Stemness, and Epithelial-to-Mesenchymal Transition." American Institute of Chemical Engineering (AIChE) 2021 Annual Meeting, Boston, MA (November 7-11, 2021).
6. **Brown SR,** Bates JC, Avera AD, Kim Y. "Effects of Fluid Shear Stress on Reactive Oxygen Species, Stemness, and Epithelial-to-Mesenchymal Transition." 2021 American Chemical Society (ACS) Annual Meeting (virtual), Atlanta, GA (August 22-26, 2021).
7. Brown SR and Kim Y. "Effects of fluid shear stress on reactive oxygen species generation and stemness." American Institute of Chemical Engineering (AIChE) 2020 Annual Meeting, San Francisco, CA (November 15-20, 2020).
8. Dunn T, Brown SR, Mnatsakanyan N, Jonas E, Kim Y, and Park HA. "Is the c-subunit of $F_OF_1$ ATP synthase an important target in circulating cancer cells?" Undergraduate Research & Creative Activity (URCA) Conference, The University of Alabama, Tuscaloosa, AL (April 2020).
9. Dunn T, Brown SR, Jonas E, Kim Y, and Park HA. "Alteration of energy metabolism in circulating cancer cells." Alabama Dietetic Association, Montgomery, AL (February 28, 2020).
10. **Brown SR. "**Fluid Dynamics and Cancer." Fluid Flow Operations Lecture, The University of Alabama, Tuscaloosa, AL (November 13, 2019).
11. Triantafillu UL, Brown SR, Kim Y. "Fluid Shear Stress Causes Resistance to Chemotherapy Drugs in Breast Cancer." American Institute of Chemical Engineering (AIChE) 2019 Annual Meeting, Orlando, FL (November 11-13, 2019).
12. **Brown SR.** "Dynamic Changes of Tumor Cells during Circulation". Department of Chemical & Biological Engineering Seminar, The University of Alabama, Tuscaloosa, AL (April 18, 2019).