

Samantha R. Corber

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Education

- **University of California, Riverside** **Riverside, CA**
Ph.D Mechanical Engineering, *Expected June 2020*
- **Washburn University** **Topeka, KS**
B.S. Chemistry, *Aug 2015*

Teaching Experience

- **Teaching Assistant for ME100A (Thermodynamics)** **Riverside, CA**
UCR Mechanical Engineering Department *Sept 2019–Dec 2019*
 - Led three discussion sections of a total of 90 students, utilizing call-and-response to walk through complex homework questions together.
 - Responsible for rubric building and grading of all exams and homework for 90 students.
 - Produced video demonstrations of key homework problems and 'muddiest point' concepts.
 - Hosted Group study session in place of traditional office hours to foster an inclusive environment and encourage collaborative learning among students.
- **Leader for ME290 (NSF-PIRE student seminar)** **Riverside, CA**
UCR Mechanical Engineering Department *Jan 2017–Apr 2019*
 - Led a seminar-style course for students involved in an NSF-PIRE grant.
 - Developed and arranged a class schedule containing research updates, literature review, professional development seminars, and outside speakers to a group of 15 graduate and UG students.
 - Authored and delivered talks to UG research club on a variety of UG-focused topics including 'navigating the research landscape' and 'linked-in and resume workshops'.
- **Student Instructor for CH121 (General, Organic, and Biochemistry)** **Topeka, KS**
Washburn University Chemistry Department *Aug 2011–Dec 2011*
 - Wrote and compiled lecture notes, co-led recitation sections with professor, and tutored UG nursing students.
 - Taught students deeper concepts one-on-one to help bridge connection between topics due to the fast-paced nature of this course.
- **Chemistry Tutor** **Topeka, KS**
Washburn University Chemistry Department *August 2010–Dec 2013*
 - Assisted lower division students from various science majors on homework and conceptual understanding of general chemistry.
 - Leveraged my experience as a student researcher to aid students in writing scientifically-robust lab reports.

Research Projects

Development of Microneedle Devices for Drug Delivery Applications

- *Ph.D Thesis, University of California, Riverside* *Jan 2016–ongoing*
 - Development of biomedical microdevices from initial conception to completed devices for ex vivo/in vivo testing.
 - Collaborated with UCSD and universities in Mexico (UNAM, INAOE, CISESE) on the development of an NSF-PIRE funded "Window to the Brain".
 - Mentored five undergraduate (4 UCR engineering, 1 community college student through MacREU) and one graduate student (Summer exchange with Saitama University, Japan).
 - Awarded Dean's Fellowship in 2015 and NSF GRFP in 2016.

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Regulation of the Immune System by DNA-Drug Nanomaterials

- *NNIN International REU, National Institute for Material Science, Japan* *May 2014–Aug 2014*
 - Overcame language and cultural barriers to investigate protein expression of macrophage cells incubated with various nanomaterials (bare and polyethyleneimine-coated carbon nanohorns, and MoS₂ monolayer sheets).
 - Authored non-peer reviewed research summary and poster, as well as a talk on Japan's research culture for REU convocation.

Drug Delivery Based on Metal Organic Framework Nanoparticles

- *NNIN REU, Washington University in St. Louis* *May 2013–Aug 2013*
 - Worked within a large, multidisciplinary group on the complete synthesis, *in vitro* and *in vivo* testing of cisplatin-based metal organic framework nanoparticles for targeted cancer therapy and imaging within a fast-paced, REU 10 week program.
 - Authored non-peer reviewed research summary, talk, and poster for REU convocation.

Patterning of Conductive Polymer Through Agarose Stamping

- *MRSEC REU, Pennsylvania State University* *May 2012–Aug 2012*
 - Developed agarose-based stamps to enable micropatterning of PEDOT on gold through electrodeposition.
 - Demonstrated drug loading capability of this system. Participated in community science demonstrations.

The Role of DbpA and RrmJ in E. coli Ribosome Assembly

- *Undergraduate Researcher, Washburn University* *May 2010–May 2012*
 - Assisted with lab set up and standardized processes as the first student in Sharpe-Elles lab. Performed DNA cloning, gentle protein/DNA/ribosome isolation and analysis.
 - Authored and awarded two grants totalling \$9,000.

Leadership and Service

Graduate Student Advisor

Riverside, CA

- *UCR Undergraduate Research Club* *Sept 2018-current*
 - Connected club officers to resources they need to accomplish their ideas.
 - Drew on my experiences leading academic clubs to guide their ideas to completion • *Projects*: Led a science fair mentorship program with a local middle school.
 - Planned and executed a mock research symposium to give UG students a venue to practice their presentations before larger conferences.

- Outreach Coordinator** **Riverside, CA**
 ◦ *UCR Association for Women in Science* *Sept 2016–June 2017*
 • Coordinated and volunteered at monthly science demonstrations in Downtown Riverside during "art walk".
 • Began planning science fair mentorship program that was carried out by Undergraduate Research Club.
- President** **Topeka, KS**
 ◦ *Washburn University ACS Student Chapter* *August 2011–May 2012*
 • Responsible for monthly meetings, and delegation/oversight of a variety of activities to campus, including outside speakers, community service, study nights, and social events with professors.
 • Conceived and executed a talk on "Getting started in research at a teaching institution" where I spoke about my REU experiences with professors explaining the process to get stated at Washburn.
- Outreach Coordinator** **Topeka, KS**
 ◦ *Washburn University ACS Student Chapter* *August 2010–May 2011*
 • Coordinated and volunteered at multiple outreach events including in house and community chemistry demonstrations as well as participate in larger events such as "Ad Astra Day" and Kansas University's "Chemistry Day".

Grants and Certificates

2016 NSF Graduate Research Fellowship	\$138,000
2012 Kansas IDeA Network of Biomedical Research, Semester Scholar Grant	\$4,000
2011 Kansas IDeA Network of Biomedical Research, ARRA Scholar Grant	\$5,000
UCR Teaching Certificate	

Publications

- Corber, S.R., Leos, Y.D., Mariano, C., Ashby, D.Z., Woo, B.W.K., Rao, M.P. Fabrication of Titanium Microneedles via Isotropic Profile Control in Deep Reaction Ion Etching. *ACS Appl. Mater. Interfaces. in preparation.*
- Corber, S.R., Otsuka, M., Cano-Velazquez, M.S., Hernandez-Cordero, J., Aguilar, G., Rao, M.P. Enhanced Optical Clearing of Ex Vivo Porcine Skin via Hypodermic Needle Array Devices. *Biomed. Opt. Express. submitted.*
- Geremew, A., Bloodgood, M., Aytan, E., Woo, B.W.K., Corber, S.R., Liu, G., Krassimir, B., Salguero, T.T., Rumyantsev, S., Rao, M.P., Balandin, A.A. Current Carrying Capacity of Quasi-1D ZrTe₃ van der Waals Nanoribbons. *IEEE Electron Device Lett.* 39, 1–1 (2018).
- Vankayala, R., Corber, S.R., Mac, J.T., Rao, M.P., Shafie, M., Anvari, B. Erythrocyte-Derived Nanoparticles as a Theranostic Agent for Near-Infrared Fluorescence Imaging and Thrombolysis of Blood Clots. *Macromol. Biosci.* 18, (2018).

Presentations and Awards

Oral Presentations.....

- Corber, S.R., Otsuka, M., Cano-Velazquez, M.S., Hernandez-Cordero, J., Aguilar, G., Rao, M.P. "Enhanced optical clearing of ex vivo porcine skin via hypodermic needle array devices" 39th Annual Conference of the American Society for Laser Medicine and Surgery (March 2019).
- Corber, S.R., Leos, Y.D., Ashby, D.Z., , Rao, M.P. "Isotropic Profile Control in Titanium Deep Reactive Ion Etching" AAAS Pacific Division 99th Annual Meeting (June 2018). **Honorable Mention**

- Corber, S.R., Leos, Y.D., Ashby, D.Z., Aguilar, G., Rao, M.P. "Isotropic Profile Control in Titanium Deep Reactive Ion Etching for Drug Delivery Systems" 9th UCR MEGSA Research Symposium, Riverside, CA (May 2018).
Materials Section Award

- Corber, S.R., Tang, R., Achilfu, S. "Drug Delivery Based on Metal Organic Framework Nanoparticles". American Chemical Society Wakarusa Valley Symposium. Topeka, KS (Sept 2013)
1st Place Undergraduate Award

- Corber, S.R. Sharpe Elles, L.M. "Exploring the Roles of DbpA and RrmJ in E.coli Ribosome Assembly". American Chemical Society Wakarusa Valley Symposium, Lawrence, KS (2012).

Poster Presentations.....

- Corber, S.R., Leos, Y.D., Ashby, D.Z., Aguilar, G., Rao, M.P. "Toward the Fabrication of Titanium Microneedle Arrays for Enhanced Optical Tissue Clearing." 19th Annual UC System Bioengineering Symposium, Riverside, CA (June 2018).

- Corber, S.R., Ashby, D.Z., Khandan, O. Cuando, N. Aguilar, G. Rao, M.P. "Progress towards the fabrication of hollow, out-of-plane, titanium microneedles for transdermal delivery of optical clearing agents". 18th Annual UC System Bioengineering Symposium. Los Angeles, CA (June 2017).

Poster Presentation Award

- Corber, S.R., Ashby, D.Z., Khandan, O. Cuando, N. Aguilar, G. Rao, M.P. " Progress towards the Fabrication of Hollow, Out-of-Plane, Titanium Microneedles for Transdermal Delivery of Optical Clearing Agents". 2017 Material Research Society Spring Meeting. Pheonix, AZ (Apr 2017).

- Corber, S.R., Tang, R., Achilfu, S. "Drug Delivery Based on Metal Organic Framework Nanoparticles". 247th American Chemical Society Spring Meeting. Dallas, TX (Mar 2014).

- Corber, S.R., Tang, R., Achilfu, S. "Drug Delivery Based on Metal Organic Framework Nanoparticles". 146th Annual Meeting of the Kansas Academy of Science. Emporia, KS (Apr 2014).

1st Place Undergraduate Award

- Corber, S.R., Sharpe Elles, L.M. "Exploring the Roles of DbpA and RrmJ in E.coli Ribosome Assembly". 1st Annual Meeting of the Corn Belt RNA Society. Lawrence, KS (Oct 2011).

Undergraduate Award