

Ryan Bensen

4121 24th Ave SE Apt. 4 • Norman, OK 73071, USA • 612-270-2221 • rcbensen@ou.edu

Education

University of Oklahoma

PhD, Biochemistry and Chemistry, GPA: 4.00/4.00

Norman, OK
2016 – Present

Michigan Technological University

BSc, Biochemistry and Molecular Biology, GPA: 3.49/4.00
Minor in Microbiology and Plant Biotechnology

Houghton, MI
2012 – 2016

Research Experience

University of Oklahoma

Graduate Researcher

Norman, OK
2016 – Present

- Designed and executed novel biochemical and analytical experiments for therapeutic development of a natural product exhibiting prophylactic and anti-cancer activity.
- Investigated biological function and target validation of an unknown oncogenic protein, ORP4.
- Developed clinically relevant analytical methods for anti-cancer drug quantification and chemotherapy monitoring
- Performed pharmacokinetic studies of anti-cancer compounds on the single cell level

Michigan Technological University

Undergraduate Researcher

Houghton, MI
2012 – 2016

- Investigated novel oncogenes through analysis of *Drosophila guttifera* pigmentation development.
- Performed liquid chromatography identification of ethanol production from plants grown on marginal land.

Food and Drug Administration

Summer Intern

Jefferson, AR
2015

- Performed virulence analysis of patient derived *Staphylococcus* through analysis of antibiotic resistance, biofilm production, and toxin production.

Leadership/ Teamwork

University of Oklahoma

Lead Teaching Assistant

Norman, OK
2016 – Present

- Taught both General Chemistry and Biochemistry Methods courses
- Selected as a lead teaching assistant responsible for coordinating fellow graduate students both new and experienced to teaching.
- Lead laboratory protocol relevant to general chemistry and biochemistry, including DNA/ protein purification and characterization.
- Taught recitation coursework in a classroom setting outside of the laboratory for general chemistry.

The Burgett Laboratory

Research Leader

Norman, OK
2016 – Present

- Guided and mentored multiple undergraduate students on novel research projects within the University established laboratory
- Assisted in both laboratory techniques and writing guidance for undergraduate students' research capstone projects.
- Coordinated with fellow graduate students/ faculty to develop peer reviewed publications incorporating multiple collaborations with various faculty.

Michigan Technological University

Undergraduate Teaching Assistant

Houghton, MI
2015

- Assisted the graduate student in preparing and teaching fellow undergraduate students in the microbiology laboratory.

Michigan Technological University's Microbiology Club

President

Houghton, MI

2015 – 2016

- Lead a group of both graduate and undergraduate students interested in microbiology.
- Designed activities, planned for regional scientific meetings, and coordinated guest speakers.

Rotary International

Treasurer

Houghton, MI

2014 – 2016

- Directed the financial collections of our sector in Michigan Technological University.
- Coordinated and participated in multiple volunteer efforts including UNICEF, Human trafficking, and End Polio Now.

Contributions to Science

1. *Phytestabilization and Bioethanol Production on Metal-Contaminated Marginal Land (Undergraduate Research).*

Under the direction of the principle investigator, Dr. Datta, and the graduate research associate at the time, Dr. Geiger, we investigated the effects of various plants on the detoxification of marginal land through phytoremediation utilizing the resulting biomass as a source for ethanol production. I was the primary researcher assisting the graduate research associate completing the analytical analysis of ethanol production, learning fundamental analytical HPLC techniques.

- a.) Geiger, Emily, "Multitasking Grasses: Phytestabilization and Bioethanol Production on Metal-Contaminated Marginal Land", Campus Access Dissertation, Michigan Technological University, 2015.

2. *Antibiotic Resistance and Biofilm Formation of Staphylococcus Species Isolated from Hospital Patients (Food and Drug Administration).*

Under the guidance of the principle investigator, Dr. Sung, we initiated the investigation of virulence factors and drug resistance from clinical isolates of *Staphylococcus*. We began investigation into the rate of biofilm formation from various strains identifying regulator genes through standard molecular biology techniques and analyzed toxin production and antibiotic resistance.

- a.) Ryan C. Bensen, Kidon Sung, Saira Iram, Saeed Khan. Antibiotic Resistance and Biofilm Formation of *Staphylococcus* Species Isolated from Hospital Patients. Central Arkansas Undergraduate Summer Research Symposium; 2015 June; Little Rock, AR

3. *Quantification of Gold Nanoparticle Cellular Uptake into Cancer Cells utilizing Single Cell ICP-MS. (Graduate Research).*

Assisted in the mammalian cell culturing and treatment with gold nanoparticles of the human bladder cancer derived cell line, T24, for the analysis of gold nanoparticle cellular uptake on the single cell level utilizing ICP-MS.

- a.) Stephan Wilhelm; Ryan C. Bensen; Naga Rama Kothapalli; Anthony W. G. Burgett. Quantification of Nanoparticle Uptake into Cancer Cells Using Single Cell ICP-MS; 2018

4. *Quantification of small molecules using single cell mass spectrometry (Graduate Research).*

Under the mentorship of the principle investigator, Dr. Burgett, alongside the collaborator, Dr. Yang, we developed a novel analytical technique for the quantification of drug-like compounds inside single cells. I partook in all responsibilities for treating and culturing mammalian cell lines and preparing patient cells, along with assisting in operating the mass spectrometry equipment and analyzing bioanalytical data for drug quantification and metabolomic analysis.

- a.) Standke, S. J.; Colby, D. H.; Bensen, R. C.; Burgett, A. W. G.; Yang, Z. Mass Spectrometry Measurement of Single Suspended Cells Using a Combined Cell Manipulation System and a Single-Probe Device. *Anal. Chem.* **2019**, 91 (3), 1738–1742.
- b.) Shawna Standke; Ryan C. Bensen; Naga Rama Kothapalli; Anh T. Le; Ning Pan; Anthony W. G. Burgett; Zhibo Yang. Investigating Single Cell Pharmacodynamics of Anti-Cancer Compounds using Quantitative Single Cell Mass Spectrometry. ASMS Conference; 2018 June; San Diego, CA.

5. *Therapeutic Potential of Oxysterol-Binding Protein Degradation Through Ligand Binding of the Natural Product OSW-1 (Graduate Research).*

I've assisted in the development of the natural product, OSW-1, as an antiviral and prophylactic ligand of the Oxysterol-Binding Protein. I'm a main contributor in quantifying OSBP and OSW-1 through both traditional biochemistry and mass spectrometry techniques upon various treatments of the natural ligand identifying a penitential novel cellular process of protein repression.

a.) Roberts, B. L.; Severance, Z. C.; Bensen, R. C.; Le, A. T.; Kothapalli, N. R.; Nuñez, J. I.; Ma, H.; Wu, S.; Standke, S. J.; Yang, Z.; et al. Transient Compound Treatment Induces a Multigenerational Reduction of Oxysterol-Binding Protein (OSBP) Levels and Prophylactic Antiviral Activity. *ACS Chem. Biol.* **2019**, *14* (2), 276–287.

b.) Zachary C. Severance; Ryan C. Bensen; Brett L. Roberts; Anthony W.G. Burgett. The Effect of OSW-1 Treatment on Endogenous Oxysterol-binding Protein Levels. Midwest Regional ACS Conference; 2017 October; Lawrence KS.