

QUALIFICATIONS

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- Completed dissertation solving two pressing microbiological questions with bioinformatic approaches
 - Currently in post-doctoral position using network analysis and bioinformatics to counteract contaminant transport in an urban river system
 - Proven history in pharmaceutical industry design drug formulations and stability
 - Proven history of team leadership and interaction with clients
 - Educational experience underscores ability to communicate and inform others
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EDUCATION

Post-Doctoral Research Assistant –
University of Texas at Austin

- *Built contaminant transport through urban watershed model using informatics approach capable of identifying sources of microbial pollution input into water system.*
- *Led 1-year 7 person field research campaign sampling 10 sites for 14 parameters to identify sources of contamination*
- *Designed molecular source tracking methods to isolate bacterial contamination sources*
- *Tracked antibiotic resistance in bacteria resulting from metal exposure using whole genome sequencing and bioinformatics*

*May
2018-present*

Graduate Research Assistant –
University of Texas at Austin

*January
2011-2018*

- *Identified new source and model of antibiotic resistance using bioinformatics and microbiological approach*
- *Created comprehensive model of Silver nanoparticle-bacteria interaction based on bioinformatic model*
- *Characterized fate and transport of eight nanoparticles based on core and coating*
- *Build biofilm-nanoparticle interaction model describing inclusion of metals in sanitation waterlines*
- *Responsible for lab operations while mentoring 7 undergraduate students; 3 of whom are now in graduate school*
- *Led metagenomics consulting group, analyzing data for more than 15 clients over 4 years*

Post-Doctoral Research Assistant –
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*May
2018-present*

Teaching Assistant – *University of
Texas at Austin*

*January
2011-2018*

- *Taught more than 100 course hours from fields as diverse as molecular biology and cell biology to hydraulic engineering and chemistry*
- *Built five new learning labs for three courses in biotechnology, molecular biology, and*
- *Developed small “choose your own adventure” problem-based learning program for large student classes resulting in a “small classroom teaching environment” for large class sizes*

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SIAD Mentor and Lab Head – <i>University of Texas at Austin</i>	<i>August 2016-2018</i>
<ul style="list-style-type: none"> • <i>Mentored more than 100 independent first-year student projects on topics ranging from artificial intelligence and organic chemistry, to psychology and social science</i> • <i>Responsible for a research lab including a lab manager, 15 peer mentors, and 100 students</i> • <i>Developed course model that led to successful publication pipeline for undergrad researchers</i> • <i>Wrote new course materials teaching grant application process and professional presentation</i> • <i>Efforts in this position led to 96% retention (improved from 54%) of at-risk students in natural sciences</i> 	

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	<i>May 2018-present</i>

Engineers without Borders	
Professional Mentor – <i>Austin, Texas</i>	
<ul style="list-style-type: none"> • <i>Led team of 26 students on projects in Panama and Peru</i> • <i>Designed water filtration system with 10-year lifespan costing \$50 for use in communities</i> • <i>Directed 10-person travel team in Panama for on-site building and community negotiations</i> • <i>Designed irrigation system near Lima, Peru helping two high mountain communities gain access to water</i> 	
	<i>August 2010-2015</i>

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Clubes De Ciencias Instructor – <i>University of Guanajuato, Mexico</i>	January 2015
<ul style="list-style-type: none"> • <i>Developed biotechnology and societal technology course for at risk students in Mexico</i> • <i>Developed lab in community and wrote 4 new lab courses in Spanish</i> • <i>Designed bacterial fuel cells with 10% improvement on reported operational output</i> • <i>Mentored 30 students, 4 of which are now in graduate schools including Harvard and UCLA</i> 	

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Post-Doctoral Research Assistant – <i>University of Texas at Austin</i>	
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Outreach Coordinator – <i>OffRoad Sciences/UT Student Outreach</i>	<i>August 2012-2016</i>
<ul style="list-style-type: none"> • <i>Wrote more than 40 hands-on research demonstrations accessible to kids in kindergarten through high school illustrating lecture series topics</i> • <i>Created 4-year college research plan preparing high school students for courses in college</i> • <i>Built a comprehensive biology-physics-chemistry-economics-societal final research project illustrating how all facets of education are fused in real world scenarios</i> • <i>Co-chaired team of 10 graduate students in efforts and led communication with lecture organizers</i> 	

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*May
2018-present*

Research Chemist II and Drug Design *June 2007-2009*
Researcher I – *Pharmaform L.L.C*

- *Led organic and chemical research group analyzing stability and formulation effectivity of new active drug ingredients through analytical and physical chemistry*
- *Conducted patent and legal analysis, preparing data and approaches for expert witnesses*
- *Developed 3 U.S. pharmacopeia analytical testing methods for drug release and stability analysis*
- *Pioneered new review process to establish project success and drug safety for company*

PROFESSIONAL SKILLS

Bioinformatics: *metagenomic analysis, transcriptomics (differential/relative), proteomics, mutational analysis, microarray analysis, weighted network analysis, random forest, various clustering analysis, PCA, tsne, motif analysis, correlational tree analysis*

Bioinformatic Software Familiarity: *Bioconductor, DESeq2, BowTie, DiffCuff, InParinoid, MeMeSuite, Qiime, MATLAB bioinformatics toolkit, some Qiime2*

Molecular Biology: *DNA, RNA, Protein extractions, PCR, qPCR, RT-qPCR, ELISA, northern/western/southern blot, cloning, HIS-tag-preparations*

Programing Languages: *R, MATLAB, Fortran, some Python*

Microbiology: *culturing, transformations, biofilm culturing, chemostat culturing, motility assays, enumeration, flow cytometry, growth assays, antibiotic resistance assays, EPS-characterization, enzymatic activity assays, various staining, sporulation assays, familiar with novel plate reader based high sensitivity growth analysis, BSL-2 and 3 trained*

Microscopy: *SEM, eSEM, TEM, confocal, phase contrast, brightfield, AFM*

Nano: *DLS, SLS, goniometry, fractal analysis, nano-sight, reductive synthesis and capping modification, SPR, fractional analysis, see microscopy*

Analytical Chemistry: *HPLC, UHPLC, GC, NFIR/IR, Flame AA, ICP-OES/AAS, MS, stripping voltammetry*

Languages: *English – Native, Spanish – conversational (EU B-1/2), Danish – intermediate (EU A-1/2)*

PUBLICATIONS

* Denotes undergraduate mentee

IN PREPARATION

Chambers, B. A., Hofmann, H., Kirisits, M. J., Silver and silver nanoparticles cause and select for antibiotic resistance in *Pseudomonas aeruginosa*. *Manuscript in preparation for Proceedings of the National Academy of Science*

Chambers, B. A., D'Alton, S., *Smith, S. K., Kirisits, M. J., A molecular biological model for the surface attachment action of silver nanoparticles. *Manuscript in preparation for American Chemical Society Nano*

Chambers, B. A., Sabaraya, I. V., Saleh, N.B., Kirisits, M. J. Cohort adoption: The effect of a four-year pre-college STEM outreach program. *Manuscript in preparation for the Journal of Science Education and Technology*

PUBLISHED

Chambers, B. A. A molecular biological model describing silver nanoparticle mechanisms of toxicity and associated antibiotic resistance. *Dissertation Published by The University of Texas at Austin. 2018*

Saleh, N. B., **Chambers, B. A.**, Aich N., Kirisits, M. J. Mechanistic lessons learned from studies of planktonic bacteria with metallic nanomaterials: implications for interactions between nanomaterials and biofilm bacteria, *Frontiers in Microbiology. 2015*

Chambers, B. A., Afrooz A. R. M. N., Bae S., Aich N., Katz, L. E., Saleh N. B., Kirisits, M. J. Effects of Chloride and Ionic Strength on Physical Morphology, Dissolution, and Bacterial Toxicity of Silver Nanoparticles. *Environmental Science and Technology. 2014* 48 (1) 761-769. DOI: 10.1021/es403969x.

Saleh, N. B., Aich, N., **Chambers, B. A.**, Afrooz, A. R. M., Kirisits, M. J. Influence of tin doping on environmental interactions of nano indium oxides in aqueous systems. *Abstracts of Papers of the American Chemical Society. 2014*

C.B. Mendez, S. Bae, **B. A. Chambers**, S. Fakhreddine, T. Gloyna, S. Keithley, L. Untung, M.E. Barrett, K. Kinney, and M. J. Kirisits, Effect of Roof Material on Water Quality for Rainwater Harvesting Systems Additional Physical, Chemical, and Microbiological Data. *Texas Water Development Board 2010*

PRESENTATIONS

Landsman M. R., **Chambers B.A.**, Kirisits M. J., Contaminant transport in an Austin Urban Watershed: approaches to isolate human influence. Waller Creek Consortium. Austin Texas, May 9th, 2019

Chambers B. A., Smith, S. K., Kirisits M. J., Silver nanoparticles induce antibiotic resistance in *Pseudomonas aeruginosa*. American Chemical Society National Meeting, New Orleans March 18-22, 2018

Chambers B. A., Smith S. K., Kirisits M. J., Resistance is not futile: Metals generate antibiotic resistance in engineered systems. Sustainability Conference. University of Texas, November 8-11, 2016

Chambers B. A., Kirisits M. J., Antibiotic resistance consequences of silver nanoparticle use. Gordon Microbial Stress Response. Mount Holyoke, July 17-26, 2016

Chambers B. A., Kirisits, M, Chloride drive low fractal dimension silver nanoparticle formation, controlling toxicity and stress response. University of Texas, March 20, 2014

Chambers B. A., Katz L. E., Kirisits M. J., Chloride concentrations and ionic strength impact the toxicity and stability of silver nanoparticles in bacterial exposure media. 87th American Chemical Society Colloid and Surface Science Symposium. University of California Riverside, June 23-June 26, 2013

Chambers B., Nguyen H. Kirisits, M.J. Microarray Analysis of Nanosilver Tolerance Strategies in *Pseudomonas aeruginosa* and *Escherichia coli*. Environmental Nanotechnology Gordon Conference, 2011, Waterville Valley, NH. Poster Presentation.

TEACHING EXPERIENCE

Clubes De Ciencias, University Of	January 2015
Guanajuato, Mexico	2016, 2017, 2018
From trash to treasure:	2017
Using bacteria to power	2016
the future	2015
Self-written course	2015
The University of Texas At Austin	2014
Scientific Inquiry Across	2011, 2013
the Disciplines	2015
Stuart Reichler and	2014
Self-written	2011
Cell Biology	2010
Arturo De Lozanne and	2006
Self-written	2005
Introduction to	
Environmental	
Engineering	
Mary Jo Kirisits	
Hydraulic Engineering	
John Burgin	
Microbiology	
Pratibha Saxena	
Marvin Whiteley	
Mary Jo Kirisits	
Molecular Biology	
Scott Stevens	
Ellen Gottlieb	
Mary Jo Kirisits	
General Engineering	
Chemistry	
Self-written course	
Organic Chemistry and	
Biochemistry for Nursing	
Students	
Fatima Fahkreddine	
General Chemistry	
Sarah Sutcliffe	

Average rating: 4.62 out of 5

CERTIFICATIONS

Translating nano-experience to an academic career: Integrating social aspects in engineering education through active learning	October 2016 Fall 2016
Active Learning Certification Program	
Interdisciplinary Education Certificate	
School of Undergraduate Education, University Of Texas At Austin	

AWARDS

<i>Ben D. Geeslin Endowed Presidential Scholarship</i>	<i>2013, 2017-2015, 2016, 2017</i>
<i>Kolodzey Travel Grant</i>	<i>2016</i>
<i>American Water Works Association Scholarship</i>	<i>2015</i> <i>2014-2015</i>
<i>University of Texas at Austin Legacy Fellowship</i>	<i>2014</i> <i>2011-2012</i>
<i>Earnest Gloyna Presidential Scholarship</i>	
<i>Texas American Water Works Association Fellowship</i>	
<i>Gus Fruh Memorial Fellowship</i>	

PROFESSIONAL SOCIETIES

<i>American Water Works Association</i>
<i>American Chemical Society</i>

PERSONAL

bicycle touring, hiking/camping, language and history enthusiast, swing dancing, amateur geologist
