**QUALIFICATIONS**

|  |
| --- |
| * 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 |

**EDUCATION**

|  |  |
| --- | --- |
| Doctor of Philosophy - *Environmental Engineering*  *Focus in bioinformatics, environmental microbiology, antibiotic resistance, nanotoxicology*  University of Texas at Austin  No. 3rd Environmental Engineering Program in world by Academic Rankings of World Universities (Shanghai)  No. 4th Environmental Engineering Program in US by US News  No. 20th Engineering program in world by Times Higher Ed.  \* note: A 6-7-year graduation timeline in engineering curricula is common at major USA universities. Students are required to design at least 3 projects on their own and find funding to conduct this research | *May*  *2018* |
| Master of Engineering - *Environmental Engineering*  *Focus in nanotoxicology, nanoparticle fate & transport, environmental microbiology, drinking water*  University of Texas at Austin  No. 3rd Environmental Engineering Program in world by Academic Rankings of World Universities (Shanghai)  No. 4th Environmental Engineering Program in US by US News  No. 20th Engineering program in world by Times Higher Ed. | *December 2013* |
| Bachelor of Science - *Biochemistry*  *Focus in antibiotic design, natural product isolation, gene pathway characterization*  University of Texas at Austin  No. 23 in Biochemistry Program in world by Academic Rankings of World Universities (Shanghai) | *May*  *2007* |

**PROFESSIONAL EXPERIENCE**

|  |  |
| --- | --- |
| 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*   * *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* | *January*  *2011-2018* |
| Teaching Assistant – *University of Texas at Austin*   * *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* | *January*  *2011-2018* |
| SIAD Mentor and Lab Head – *University of Texas at Austin*   * *Mentored more than 100 independent first-year student projects on topics ranging from artificial intelligence and organic chemistry, to psychology and social science* * *Responsible for a research lab including a lab manager, 15 peer mentors, and 100 students* * *Developed course model that led to successful publication pipeline for undergrad researchers* * *Wrote new course materials teaching grant application process and professional presentation* * *Efforts in this position led to 96% retention (improved from 54%) of at-risk students in natural sciences* | *August*  *2016-2018* |
| Engineers without Borders Professional Mentor – *Austin, Texas*   * *Led team of 26 students on projects in Panama and Peru* * *Designed water filtration system with 10-year lifespan costing $50 for use in communities* * *Directed 10-person travel team in Panama for on-site building and community negotiations* * *Designed irrigation system near Lima, Peru helping two high mountain communities gain access to water* | *August*  *2010-2015* |
| Clubes De Ciencias Instructor – *University of Guanajuato, Mexico*   * *Developed biotechnology and societal technology course for at risk students in Mexico* * *Developed lab in community and wrote 4 new lab courses in Spanish* * *Designed bacterial fuel cells with 10% improvement on reported operational output* * *Mentored 30 students, 4 of which are now in graduate schools including Harvard and UCLA* | *January*  *2015* |
| Outreach Coordinator – *OffRoad Sciences/UT Student Outreach*   * *Wrote more than 40 hands-on research demonstrations accessible to kids in kindergarten through high school illustrating lecture series topics* * *Created 4-year college research plan preparing high school students for courses in college* * *Built a comprehensive biology-physics-chemistry-economics-societal final research project illustrating how all facets of education are fused in real world scenarios* * *Co-chaired team of 10 graduate students in efforts and led communication with lecture organizers* | *August*  *2012-2016* |
| Research Chemist II and Drug Design 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* | *June 2007-2009* |

**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 Guanajuato, Mexico  From trash to treasure: Using bacteria to power the future  Self-written course  The University of Texas At Austin  Scientific Inquiry Across the Disciplines  Stuart Reichler and Self-written  Cell Biology  Arturo De Lozanne and Self-written  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* | January 2015  2016, 2017, 2018  2017  2016  2015  2015  2014  2011, 2013  2015  2014  2011  2010  2006  2005 |

**CERTIFICATIONS**

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

**AWARDS**

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

**PROFESSIONAL SOCIETIES**

|  |
| --- |
| *American Water Works Association*  *American Chemical Society* |

**PERSONAL**

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