AUBURN UNIVERSITY
Harrison College of Pharmacy

IAN STEINKE

Phone: (989) 657-2325
ims0021@auburn.edu

1311 North College Street
Auburn, Al, 36830

EDUCATION

Auburn University - Auburn, AL
- Graduate Studies in Medicinal Chemistry
- GPA: 3.85
- August 2019 – May 2023 (expected)

Ferris State University – Big Rapids, MI
- Bachelor of Science - Industrial Chemistry Technologies
- Graduated May 2019

Ferris State University – Big Rapids, MI
- Associate of Applied Science - Industrial Chemistry Technologies
- Graduated May 2018

Alpena Community College – Alpena, MI
- Associate of Science – Chemistry
- Graduated May 2016

HONORS, AWARDS, AND CERTIFICATES

- **Schrödinger's "Introduction to Molecular Modeling in Drug Discovery" Certificate,** February 29, 2020

- **Student Research Fellowship,** Dr. Daniel Adsmond, Summer 2017

- **Ferris State Transfer Crimson Scholarship**, Fall 2016 - Spring 2019

RESEARCH EXPERIENCE

Auburn University / Harrison School of Pharmacy / Drug Discovery and Development / Auburn, AL

Fall 2019 to Present

Graduate Teaching Assistant: Advisors Drs. Rajesh Amin and Forrest Smith

- Successfully developed and synthesized a series of compounds to study the effects of pan Peroxisome Proliferator Activated Receptors (PPAR) agonists, and their role in modulating disease pathologies, i.e. neurodegeneration and Non-Alcoholic SteatoHepatitis (NASH). Using high throughput virtual screening, ligand docking, and molecular dynamics I was able to identify characteristic molecular behavior that correlated to specific types of PPAR agonists and antagonists for further compound lead optimization. Lead compounds were further screened and filtered using ADMET predictive software to identify strengths and weaknesses associated with varying chemical moiety's that would enhance absorption, cell permeability, and decrease toxicity. My lead compound has been patented and is under in vitro investigation to examine transcriptional and physiological activity in hepatocytes (HepG2). My goal in moving forward is to further synthesize other prospective leads to better understand how PPAR modulation can be controlled in the avoidance of harmful side effects typically observed in this class of drugs.

Ferris State University / College of Pharmacy / Big Rapids, MI

Fall 2017 to Summer 2019

Senior Research Assistant: Dr. Tracey Ward

- In a collaborative effort with Auburn University (Dr. Raj Amin), I synthesized chemical compounds selective for PPAR gamma and delta in the treatment of Alzheimer's Disease to advance the study into animal models. My goal was to develop synthetic routes for our lead compounds that would allow for substantial scale up of our final yields. I recruited, trained, and managed several undergraduates to aid in the synthetic development of our compounds. This research experience significantly advanced my understanding of reaction mechanisms and synthetic techniques through extensive examination of the literature and textbooks. Here I developed a passion for chemical synthesis and embraced the challenges that come with performing research. During this time, I learned how to manage inventory and order necessary supplies in a cost-effective manner by shopping around different vendors and standardizing costs per unit in Excel spreadsheets. I became proficient with the following instruments: UV-vis Spectroscopy, Liquid Chromatography Mass Spectrometry, Gas Chromatography Mass Spectrometry, Liquid-Solid Chromatography, and High-Pressure Liquid Chromatography.

Ferris State University / Physical Science Department / Big Rapids, MI

Summer 2017

Student Researcher: Dr. Dan Adsmond

- As part of my first independent research project, I studied the mechanisms and bonding interactions between sulfa drugs and Nitrogen-containing acceptor molecules. I accomplished this goal by synthesizing eight new cocrystal structures that were of high enough quality to be analyzed by Xray Crystallography. I learned beneficial benchtop chemistry skills and techniques that allowed for successful crystallization of the desired compounds. This project furthered my understanding of inter and intramolecular bonding and how I could take advantage of these properties when it comes to solvation, evaporation, and crystallization. I further evaluated crystallographic structures and gathered information that allowed for further improvements in technique and understanding of the project. I also became proficient at analyzing hydrogen bonding and compound identification using HNMR and IR spectroscopy. These research results were presented by PowerPoint presentation at Ferris State University as well as a poster presentation at the Spring 2018 American Chemical Society national meeting.

TEACHING EXPERIENCE

Ferris State University – Tutor for Quantitative Analysis

Fall 2018

Auburn University – Teaching Assistant PharmD Compounding Labs

Fall 2019 – Present

PRESENTATIONS

- **Poster Presentation**, "DESIGN AND DEVELOPMENT OF NOVEL DUAL PPAR δ/α AGONIST FOR NEURODEGENERATIVE DISEASE", Via Research Recognition Day – Auburn Campus.

February 18th, 2022

- **Poster Presentation**, "Design and development of novel Pan-PPAR agonist for hepatic steatosis", Boshell 13th Annual Research Day.

September 17th, 2021

- **PowerPoint/Poster Presentation**, "Novel pan PPAR agonist enhances synapse stability and growth in a model of Alzheimer's Disease." 21st International Conference on Alzheimer's Drug.

  October 5-6, 2020

- **Poster Presentation**, "Gut microbiota metabolite, TMAO, induces microglial activation and senescence in rodent models with memory impairment.", Center for Neuroscience Initiative Convention.

  February 28, 2020

- **Poster Presentation**, "An Investigation of the Hydrogen Bond Connectivity between Sulfa Drugs and Hydrogen Bond Acceptors in Cocrystals", American Chemical Society National Convention.

  March 18-22, 2018

- **PowerPoint Presentation**, "An Investigation of the Hydrogen Bond Connectivity between Sulfa Drugs and Nitrogen Containing Co-formers and Co-crystals", Ferris State University Student Research Fellowship Presentation.

  Summer 2017

COMPUTER SKILLS

Programming: Python, R programming; **Software**: Excel, Word, PowerPoint, ChemDraw, Lab Solutions, BlackBoard, Mercury, Schrodinger, GastroPlus, Prism, PanLab

PUBLICATIONS

- Steinke, I., Amin, R.H., manuscript submitted for publication, "*Design of Novel PPAR Agonist for Neurodegenerative Disease.*", Nuclear Receptors, Springer International Publishing

- Govindarajulu, M., Pinky, P.D., **Steinke, I.**, Bloemer, J., Ramesh, S., Kariharan, T., Rella, R.T., Dhanasekaran, M., Suppiramaniam, V., and Amin, R.H., Published August 12th, 2020, "*Gut metabolite TMAO induces synaptic plasticity deficits by promoting Endoplasmic Reticulum stress.*", Frontiers in Molecular Neuroscience

- **Steinke, I**., Ghanei, N., Govindarajulu, M., Yoo, S., Zhong, J., and Amin, R.H., Published October 29th, 2020, "*Drug discovery and development of novel therapeutics for inhibiting TMAO in models of atherosclerosis and diabetes.*", Frontiers in Physiology, Clinical and Translational Physiology

- Fu, X., Eggert, M., Patel, N., Yoo, S., Zhong, J., **Steinke, I**., Govindarajulu, M., Turumtay, E.A., Mouli, S., Panizzi, P., Beyers, R.J., Denney, T.S., Arnold, R.D., and

Amin, R.H., Published April 12th, 2021, *"The cardioprotective mechanism of Phenylaminoethyl Selenides (PAESe) against Doxorubicin-induced cardiotoxicity involves the iron sulfur protein frataxin."* Frontiers in Pharmacology