

JOSEPH SCHULZ, MS

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Education

PhD in Cell Biology, University of Miami, Miami FL	2021-Present
M.S. in Biomedical Sciences, University of Central Florida, Orlando, FL Neuroscience Track	2019-2021
B.A. in Chemistry, Honors in the Major, Rollins College, Winter Park, FL	2015-2019

Research

University of Miami (Miami, FL)

- PhD Doctoral Candidate*, Advisor Stephan Schurer 3/2023-Present
- ◆ Developed a pipeline to analyze the protein-protein-interactions in AlphaFold generated models of unsolved crystal structures
 - ◆ Leveraged advances in Artificial Intelligence to design and test small molecules *in silico* using open source tools, as well as subscription based platforms Maestro and ICM-Pro.
- Predocutorial Thesis Candidate*, Advisor Juan Dominguez-Bendala 1/2022-2/2023
- ◆ *In/ex vivo* regeneration of neogenic insulin producing cells in murine models of type I diabetes
 - ◆ *Ex vivo* regeneration of neogenic insulin producing cells in pancreatic tissue from type I diabetic donors
 - ◆ *Time Lapse Calcium Imaging using fluorescent reporters to monitor functionality of neogenic insulin producing cells*
- PhD Rotation Student*, Advisor Dr. Zane Zeier 10/2021-12/2022
- ◆ Clearing of Brain Organoids Derived from iPSC to model the Invasiveness of GBM
- PhD Rotation Student*, Advisor Dr. Mario Saporta 8/2021-10/2021
- ◆ Gene Replacement Therapy as a Therapeutic to Treat Charcot-Marie-Tooth Disease in Patients with Known Mutations

Rollins College (Winter Park, FL)

- Honors Thesis Research Student*, Advisor: Dr. James Patrone 2018–2019
- ◆ Developed the first synthetic scheme to synthesize the natural products Thalassotalic Acids A-C, as well as unnatural analogs using standard techniques including liquid-liquid extraction, air-free chemistry, distillation, column chromatography, and recrystallization
 - ◆ Determined the Structure Activity Relationship between the analogs and the target enzyme, Tyrosinase, by running inhibition assays on an HTX multimode microplate reader
 - Synthesized unnatural analogs with superior inhibition than the natural analogs, warranting further investigation in this class of inhibitors
 - ◆ Confirmed the synthesis using a variety of analytical methods, including ¹³C NMR, ¹H NMR, HRESIMS, and 2D NOESY

Scientific Publications

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- Schulz, J.M.;** Lanovoi, H. T.; Ames, A. M.; McKegg, P.C.; Patrone, James D.; Concise Modular Synthesis of Thalassotalic Acids A–C. *J. Nat. Prod.* **2019**, 82 (4), 1045–1048.
- Schulz, J.M.,** The Potential of Induced Pluripotent Stem Cells to Treat and Model Alzheimer’s Disease., *Stem Cells Int.*, **2021**, 2021, 5511630.
- Schulz, J.M.,** Tamayo-Garcia, A, Moulin, C, Altilio-Bove, I, Xu, XX, Embryonic Adipose Development and Consequences in Later Life., *SCIREA Journal of Biology*. Vol. 8, No. 5, **2023** ,pp.118-137 .
- Doke, M., Álvarez-Cubela, S., Klein, D., Altilio, I., **Schulz, J.**, Mateus Gonçalves, L., Almaça, J., Fraker, C. A., Pugliese, A., Ricordi, C., Qadir, M. M. F., Pastori, R. L., & Dominguez-Bendala, J. Dynamic scRNA-seq of live human pancreatic slices reveals functional endocrine cell neogenesis through an intermediate ducto-acinar stage. *Cell Metabolism*. (2023).
- Khurshid, R., **Schulz, J.M.**, Hu, J., Snowden, T., Reynolds, R., Schürer, S., Targeted degrader technologies prospective SARS-CoV-2 therapies. *Drug Discovery Today*.29, 103847 (2024).

Poster Presentations

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- Schulz, J.M.;** Patrone, James D. Synthesis and evaluation of thalassotalic acid A and analogs. Abstracts of Papers, 257th ACS National Meeting & Exposition, Orlando, FL, United States, Mar. 31- Apr. 4, 2019, MEDI-0298.
- Altilio, I.; Alvarez-Cubela, S Klein, D.; **Schulz, J.M.;** Pastori, R.; Dominguez-Bendala, J. Tracking Functional Beta Cell Regeneration in Human Pancreatic Slices Using Adenoviral Transduction. 15th Annual JDRF nPOD Meeting, Fernandina Beach, FL, United States Feb. 26-Mar. 1, 2023.
- Schulz, J.M.;** Schurer, S.; A Free Analysis Pipeline to Analyze AlphaFold Multimer Models to Find Drug Targets for

Type I Diabetes. The University of Miami's Miller School of Medicine Department of Medicine' 9th Annual Eugene J. Sayfie, Miami FL, United States, Mar. 15th, 2023.

Schulz, J.M.; Schurer, S.; Probing Protein Protein Interactions to identify Hot Residues for Early Drug Investigations. The University of Miami's 5th Annual Graduate and Post-Doctoral Research Symposium, Coral Gables FL, United States, Mar. 21st, 2023.

Schulz, J.M.; Using Neural Network Models to Conduct Structure Based Virtual Screens. Institute For Data Science and Computing 1st Annual Computational Poster, Coral Gables FL, United States, Apr. 14th, 2023.

Schulz, J.M., Khurshid, R., Schürer, Sa., Schürer, In Silico Design of Next Generation Targeted Protein Degradors As Novel Cancer Therapeutics, 23rd Annual Zubrod Memorial Lecture and Sylvester Cancer Research Poster Session, University of Miami's Miller School of Medicine, Nov. 15th, 2023.

Schulz, J.M., Schürer, Sa., Schürer, S., Junction Analysis Results Interface: A Tool for PROTAC Linker Design, 2nd Annual Computing Day Hosted by the Institute for Data Science & Computing, Coral Gables FL, United States, Apr. 23rd, 2024.

Oral Presentations

Schulz, J.M.; Introducing JERI: The only non-contact door operating system for interior residential openings. Rothberg Catalyzer Event, Coral Gables, Miami, May 3rd, 2023.

Schulz, J.M.; Intermittent Fasting as a Potential Preventative Treatment for the Progression of Type II to Type III Diabetes (Alzheimer's Disease). 4th Edition of Innovations in the State of the Art in Alzheimer's and Dementia., Barcelona, Spain, Sept. 14th, 2023.

Schulz, J.M.; The Advancements of JERI: The only Patented non-contact door operating system for interior residential openings. Smart Cities Miami 2024, Coral Gables, Miami, April 11th, 2024.

Schulz, J.M.; Introducing JEIR: An Artificial Intelligence Chatbot for educating people about methods to prevent Type 3 Diabetes. Rothberg Catalyzer Event, Coral Gables, Miami, April 30th, 2024.

Patents

Schulz, Joseph M. *Non-Contact, Automatic Door Hinge Operator System.*, US Patent No. 11,719,035, filed Sep. 9, 2020 and issued Aug. 8, 2023.

Additional Instructional Experience

Osher Lifelong Learning Institute (Miami, FL) 2022-2023

Instructor

- ◆ Developed and instructed a 6 week long course called "Nutrition of the Mind" focusing on how the food we consume effects our mind

Program in Biomedical Sciences: Introduction to Biomedical Sciences (Miami, FL) Fall 2022

Graduate Teacher Assistant, University of Miami

- ◆ Worked with the 1st year PiBS students and provided instruction including tutoring sessions, mock questions, and review sessions to prepare them for their exams
- ◆ Provided mentorship and guidance to any students that were in need of support

Immunology Lab (Orlando, FL) Spring 2021

Graduate Teacher Assistant, University of Central Florida

- ◆ Due to COVID-19, this course was instructed via zoom so I was tasked with monitoring the chat and answering any questions
- ◆ Led zoom-based review sessions to go over any concepts that might have been missed during the virtual lab

Central Florida Tutoring Services (Orlando, FL) 2016-2021

Private Tutor

- ◆ Developed an effective technique and strategy to help 30+ math and science high school students struggling in specific courses to succeed, modeled after the Feynman Technique of Instruction
- ◆ Implemented daily homework assignments that would be assigned a week in advance and we would cover at the beginning of each section, ensuring that the student mastered the prior week's topics

Sylvan Learning Center (Winter Park, FL) 2019-2020

Instructor

- ◆ Educated high school aged kids all the way up to undergraduate students in groups ranging from one to five

students in various topics of science and mathematics

- ◆ Standardized Exam instruction in SAT, ACT, GMAT, and GRE course instruction
- ◆ Provided additional support and guidance to students that struggled to grasp concepts or couldn't retain the information
- ◆ Developed strategies to mitigate the fear and anxiety associated with exams and testing environments

Awards and Accolades

- ◆ President's List (Rollins College)
 - Fall 2015
- ◆ Dean's List (Rollins College)
 - Spring and Fall 2017
 - Spring 2018
 - Spring 2019
- ◆ The Archibald Granville Bush Award, F15, S16, S17, F17, S18, S19
 - Presented by the Division of Science and Mathematics for Excellent Standard in Academic Pursuit
- ◆ Dean's Scholarship Recipient, Rollins College
- ◆ Donald J Cram Science Scholarship, Rollins College
- ◆ Student-Faculty Collaborative Research Scholarship
- ◆ 2017 Global Advocate Summit Scholarship, GenUN
 - Covered travel and food expenses related to lobbying in Washington DC
- ◆ George Allen Award, Rollins College, 2019
 - Most outstanding publication in the natural sciences
- ◆ 2023 Rothberg Catalyzer Award Recipient for the development of a prototype Non-Contact Automatic Door Operator System
- ◆ 2023 Spring NSLS BUILDING EQUITABLE LEADERS Scholarship Award for my commitment to diversity, equity, and inclusivity.
- ◆ 2023 Summer BioSolveIT Scientific Challenge Participant
- ◆ 2023 Fall NSLS Alumni Leadership Award
- ◆ 2024 Rothberg Catalyzer Award recipient for developing an Artificial Intelligence Chatbot for Preventing Type 3 Diabetes