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## Jeremy Baum

Jeremy Lee Rueff Baum was born in Nürnberg, Germany. In January 2008, he entered the College of Arts and Sciences at Valdosta State University (VSU) majoring in Chemistry with a focus on Medicinal and Analytical Chemistry. After graduating magna cum laude from VSU with his B.S. in December 2011, Jeremy continued as a research assistant working on his prior research. His research focused on drug delivery systems derived from marine natural products and modification of cancer drugs, specifically metal-doped Taxol derivatives. Further, he also investigated the formation of nano-bacteria and their potential for harm to humans and the environment. In 2012, he was admitted to the Graduate School of the College of Arts and Sciences at the University of Miami in the department of Chemistry and became a de facto member of the Department of Biochemistry and Molecular Biology. He focused his research on developing non-invasive diagnostics for the detection of biomarkers and pollutants in breath and the environment. He worked on the development of miniaturized field-deployable sensor systems for sampling volatile and semi-volatile organic compounds known to be biomarkers and exposure risk compounds, culminating in the design of a patented solid-state sensor system for non-invasive detection of drowsiness for accident prevention while driving and at the workplace. He is also part of the Firefighter Cancer Initiative project at the Sylvester Comprehensive Cancer Center, helping to develop passive and active real-time monitoring systems to limit firefighter exposure to carcinogens.



During his free time, he can be found tinkering and making things in his garage; weather permitting, he always enjoys sailing, diving, and fishing.

### **1)Q: What made you choose the University of Miami?**

A: Since my early days in school when I first began to study science, I knew that one day I would help people through scientific research. The University of Miami presented a focus on health-related chemistry research with a strong support for translational science that aligned perfectly with my interests. Of course, the weather and proximity to the ocean was a major plus!

**2)Q: Tell me about your training process.**

A: I had a great opportunity to be offered brand new multi-disciplinary projects, which expanded my training into new fields. I took on these opportunities even though it would require intensive groundwork to get them up and running - everything was new, and because of the nature of these projects, my training definitely challenged me to independently develop protocols and troubleshoot issues. Altogether, the many obstacles I encountered and overcame during my training helped me cultivate and refine my problem-solving skills and being able to think on my feet when there were no obvious answers. My experiences also taught me the managerial skills to not only balance projects but also be a team leader. I had valuable opportunities to work with research teams from various departments and companies, which expanded my horizons and contributed to my research abilities and skillset as a scientist. These opportunities were facilitated by the plethora of collaborations my advisors hold in both academia and industry. Their generous financial support also provided me with the ability to present at conferences, perform fieldwork, and work in industrial laboratory settings.

**3)Q: Describe your working experience with the institute.**

A: My work experience at the University of Miami would be best described as fast paced and dynamic with an overall welcoming collaborative environment for research. Additionally, the institute offers many events and gatherings to meet with fellow students and researchers to exchange ideas and forge new research projects, which was always inspiring.

**4)Q: What did you particularly enjoy most?**

A: I worked with and got to know individual firefighters, whose exposure to carcinogens was the focus of one of my research projects. It added a personal component to my research that I did not anticipate when I first started studying chemistry. It has been extremely rewarding to see our research make a positive impact on policies to improve firefighter health as we have worked together year after year. I truly feel that the research work I was a part of will help save lives.

**5)Q: Tell me about your most exciting scientific breakthrough?**

A: The integration and confirmation of our breath-based drowsiness sensor system in a real-world vehicle was very exciting. This was a project where chemistry met engineering, yielding a functional diagnostic tool that can be expanded for use in health and occupational environments.

**6)Q: How do you think the research has impacted you as a scientist/engineer and how has it influenced your career path?**

A: My research has shown me that I can overcome obstacles outside of my field of chemistry, pushing me out of my comfort zone. Venturing into Public Health had the greatest impact on my outlook as a researcher, as the focus was to improve health outcomes by reducing carcinogen exposure and hopefully save lives. While I do not believe my planned career path has changed much, I would say I am much more willing to branch out into other fields and specialties with a newfound confidence. I believe that cultivating the right attitude, remaining open-minded, thinking outside the box, and collaborating can lead to scientific breakthroughs.

**7)Q: Tell me what your next steps will be and career goals.**

A: For the near future, I am staying at the University of Miami to help launch an expanded research laboratory/facility in an effort to increase our reach within the firefighter community. I will also be working on a few new exciting projects related to the SARS-CoV-2 virus, which is very relevant to the current global health situation. Depending on how my position develops, I could see myself staying with the University long-term. Generally, I see myself transitioning into a more managerial position where I can help guide and shape research projects from the ground up. I noticed I had a knack for keeping multiple components of large research projects together and on track for our team which helped lead to satisfactory delivery of on-time results.

**8) Q: Is there anything else you would like us to know about you?**

A: The experiences gained through the translational aspects of our research as well as the interdisciplinary exposure from seminars and guest speakers offered through BioNIUM, and other opportunities, such as C2C from UInnovation, truly awoke the engineer and inventor in me. I may be a chemist by trade now, but I am also an inventor at heart.