



Amir Abdelzaher

Research Assistant

NSF-NIEHS Oceans & Human Health Center Role: Research Experience for Undergraduates (REU) NSF OHH Award Recipient

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Education

- University of Miami, Coral Gables, FL Bachelor of Science in Environmental Engineering, *December 2005*

Research Interests

Through my current research I have developed a vast interest in ocean water quality and its relation with human health. During this past summer of 2004, I have worked in an extensive recreational microbe indicator study of enterococci at Hobie Beach, Miami as part of the ongoing University of Miami Center for Oceans and Human Health (OHH) Recreational Microbes project. My team and I have been responsible for the collection as well as the analyses of the water and sediment at Hobie Beach. The methods we used to analyze the samples included membrane filtration as well as Idexx. After extensive sampling and analysis, we noticed relationships between the microbe concentrations and environmental parameters. More specifically, we noticed that the dominant factors affecting the microbe concentrations were the tidal stage and rain.

Furthermore, after looking at the different spatial concentrations of the microbes, we concluded that the main source of the enterococci was the sand region between high and low tide, also known as the swash zone. Recently my team put a presentation together summarizing our summer research and won first place for undergraduate presentations at the Florida American Society of Microbiology Conference in April 2005. Since the summer of 2005 several sampling efforts of enterococci were conducted including two QAQC efforts, winter sampling, and a 4 hour variability study which involved analyzing samples every 10 minutes. This study showed that the peak of enterococci levels occurred about 45 minutes after high tide reaffirming the fact that tide is one of the main factors affecting indicator microbe concentrations.

Along side the many enterococci sampling efforts during the 2004/2005 school year, I am also comparing two methods of virus concentration: Virus Sorption and Tangential Flow Filtration (TFF). The two systems were compared using coliphage from Hobie Beach samples. Virus Sorption had less recovery but resulted in much cleaner samples. TFF provided higher recovery rates but interference was often observed from the large number of organisms concentrated by this system. We also conducted a large collaborative sampling effort which included University of Miami, NOAA, and University of Florida, where my team was responsible for concentrating 20 L of seawater by both methods and sending the concentrate to NOAA and University of Florida for the analysis of several human pathogens by advanced molecular methods.

Participation in the University of Miami Center for Oceans and Human Health REU program gave me the opportunity to share my research with as well as learn from others in the same field through presentations and meetings. The program specifically addresses the research issues, which I plan to further pursue after my undergraduate work is complete. I am confident that I can continue to work diligently and professionally on this project to produce results that will ultimately help us protect the health of those who wish to enjoy the numerous benefits of our beaches.

Upon completion of my undergraduate degree in Environmental Engineering at the University of Miami, I hope to enter graduate school and continue working on this OHH project with Dr. Helena Solo-Gabriele. My goal is to receive my Ph.D in the environmental engineering field and get involved in large collaborative research projects such as this one. I hope that a thorough understanding of human health risks existing in various bodies of water will allow me to explore various engineering interventions that will decrease those risks.

Representative Publications

Co-Author of first prize-student paper competition at the 2005 Annual Meeting of the Florida Branch of the American Society for Microbiology for presentation and abstract entitled, "The Source of Enterococci to a Subtropical Recreational Beach is the Inter-Tidal Zone." Co-authors on the abstract include **Amir AbdelZaher**, Nick Heybeck, and Helena Solo-Gabriele of U.Miami, Samir Elmir of Miami-Dade Department of Health, Kelly Goodwin of NOAA, and Chris Sinigalliano of FIU., 2005