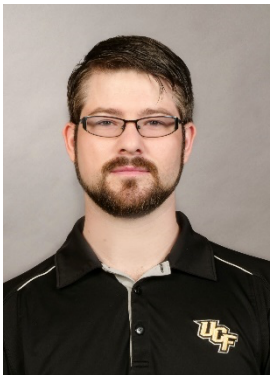
Department of Chemistry Seminar Series
Spring 2023

Friday, March 31, 2023, 3:30 PM – **HPA1-O119 (Health Sciences)**

Detection, Occurrence, and Biodegradation of Sucralose: A Proposed Anthropogenic Source Tracker



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Anthropogenic source trackers (ASTs) are a category of chemical compounds and biotic species that can be utilized to connect anthropogenic contamination, primarily wastewater or industrial runoff, to its source. This has allowed for understanding the impact of anthropogenic effects on human on environmental systems. A more recent addition to the list of ASTs has been sucralose, an artificial sweetener which has seen wide and increasing usage over the last 15 years, due to the trend towards diet-based consumer foods. Sucralose is a non-caloric sweetener derived from sucrose that is not metabolized in humans with >99% of it excreted intact. It is also highly resistant to standard wastewater treatment methodologies and therefore is has been observed in wastewater influent and effluent, leading to its release into the environment. The usage of an anthropogenic source tracker is related to three primary factors, specificity, detectability, and its persistence. In recent years sucralose has been increasingly detected in environmental systems with no direct input from anthropogenic sources. The presence of sucralose as a background signal in the environment would limit its use to location with historic data to compare to.

The purpose of this research was to determine sucralose's current performance as an anthropogenic source tracker with regard to its persistence in the environment and its detectability. The studies presented found that, while the occurrence of sucralose in many places is still below the limit of detection for some methods, the presence of sucralose is not always correlative to other well studied and utilized anthropogenic markers. Additionally, two locations that have been consistently exposed to sucralose over several years were investigated for their degradation potential to it. Preliminary results show that change in the microbiome associated with sucralose aligns with data from previous studies and the potential for degradation in aqueous environments is low.