



## Brett Froelich, PhD

Assistant Professor, Department of Biology

### Education

PhD, Biology, University of North Carolina

### Key Interests

Microbiology | Microbial Ecology | Microbial Physiology | Type VI Secretion | Aquaculture | Shellfish | Oysters | Microbial Competition | Bacterial Genetics

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### SELECT PUBLICATIONS

- › B. A. Froelich *et al.*, In hot water: effects of climate change on *Vibrio*-human interactions. *Environ Microbiol* 10.1111/1462-2920.14967 (2020).
- › B. A. Froelich *et al.*, Decadal monitoring reveals an increase in *Vibrio spp.* concentrations in the Neuse River Estuary, North Carolina, USA. *PLOS ONE* 14 (4) (2019).
- › B. A. Froelich *et al.*, Development of a matrix tool for the prediction of *Vibrio* species in oysters harvested from North Carolina. *Appl Environ Microbiol* 81 (3) 1111-9 (2015).
- › B. A. Froelich *et al.*, Integration of *Vibrio vulnificus* into marine aggregates and its subsequent uptake by *Crassostrea virginica* oysters. *Appl Environ Microbiol* 79 (5) 1454-1458 (2013).

### Research Focus

I study the ecology and physiology of human pathogens, specifically *Vibrio vulnificus* and *V. parahaemolyticus*. These bacteria typically gain access to the human host when eating raw shellfish, especially oysters. A better understanding of the ecological and physiological interactions between *Vibrio* and shellfish can ultimately lead to fewer infections.

### Current Projects

- We are examining the variations of toxins produced by *Vibrio vulnificus* bacteria, secreted by the Type VI secretion system, and the role in bacterial competition for surface space. When the bacteria are on a surface and make contact, they inject each other with a toxin, causing cell death. Different strains produce different toxins, and we have currently uncovered 16 different types. Some strains produce an antitoxin for the toxins that other strains possess. We are creating a susceptibility matrix to better understand these microbial interactions in vivo.
- We are developing a probiotic treatment for oysters grown in aquaculture. Combining research in techniques to remove competing bacteria, increase bacterial uptake efficiency in oysters, we will treat oysters with a probiotic bacterium to reduce human infections.