5-2022

Ciliate Endosymbiont Imaging Methodology

Aidan Boving
University of Rhode Island, aidanboving@uri.edu

Roxanne Beinart
University of Rhode Island, rbeinart@uri.edu

AIDAN BOVING

(Health Studies, Cell & Molecular Biology)

Ciliate Endosymbiont Imaging Methodology

Sponsor: Roxanne Beinart (Graduate School of Oceanography)

Ciliates, a phylum of diverse microbial eukaryotes, are found in a wide range of environments, including anoxia. Anaerobic ciliates host intracellular methanogenic archaea – a unique type of symbiosis. Despite their importance, anaerobic ciliates and their symbiotic relationships remain understudied. Included in this is the ability to image and quantify the intracellular methanogenic symbionts in a precise, timely and replicable procedure. This project aimed to improve the current fluorescence microscopy methodology used for endosymbiont quantification. The proposed method is intended for use with the Opera Phenix, a high throughput spinning disk confocal microscope which can count large amounts of individual cells automatically. Cells obtained from anaerobic cell cultures were fixed in paraformaldehyde, washed, and filtered before imaging. The findings of the study indicate that the method developed has potential. A challenge that remains is removing fine debris from the sample that interfere with automatic cell counting, while ensuring high ciliate concentrations that can be quantified. Once this challenge is addressed, the method developed could aid in gaining new insights into the complex relationship between ciliates and their endosymbionts.