

Inducing reproductive development and spore release in tubular *Ulva*

Cailin Martin¹, Sara Labbe² & Lindsay Green-Gavrielidis²

¹Cultural, Global, & Environmental Studies, Salve Regina University, Newport, RI

²Biology & Biomedical Sciences, Salve Regina University, Newport, RI

The macroalgae *Ulva* are a ubiquitous, major contributor to biofouling colonies. Biofouling affects the durability and functionality of marine sensors amongst other marine technologies. *Ulva* has an isomorphic alternation of generations from a diploid sporophyte which produces quadriflagellate zoospores to haploid gametophytes that produce biflagellate gametes that fuse to develop into the sporophyte. Quadriflagellate zoospores of *Ulva* are used as a model organism in many biofouling studies. The goal of this study was to develop a protocol to induce reproduction and spore release in *Ulva* to offset issues with current field collection methods. Common concerns include seasonal time constraints and inconsistent supply of reproductive *Ulva*. This prevents experiments from running consistently and timely. We quantified the effect of temperature shock, photoperiod, and nutrients on initiating reproduction of tubular *Ulva*. Experiments exposed the thalli to a temperature shock (4C) for 1 hour while submerged in 1 mL of sterile filtered seawater (- nutrients) or 1 mL of sterile filtered Von Stosch (+ nutrients). Half of the specimens were subsequently placed under a 12:12 light:dark photoperiod at 20C. The remaining half were placed under a 16:8 light:dark photoperiod at 20C. Thalli were monitored daily for signs of reproductive development and evidence of spore release. We found spore release generally peaked two days after the temperature shock. We also found most thalli in these experiments released biflagellate gametes and few released the desired quadriflagellate sporophytes. The specimens which released sporophytes are being replicated and maintained for further study.