Sargassum sp. Reductive, Polyphenol Extract Modulates D. dorotocephala Regeneration by Reduction of ROS, and Has Potential as an Anti-Inflammatory Agent

Lian, Julianna (School: Florida Atlantic University High School)

There exist evolutionarily-conserved genetic similarities between signals for planarian regeneration and human inflammation. The ROS-activated TRPA1 ion channel is implicated in planarian regeneration and has been established as an interendothelial doorway for mammalian acute and chronic inflammation—the latter of which can cause tissue dysfunction, injury, and risk factors for other diseases like diabetes and certain cancers. To mitigate the chronic condition, a polyphenol Sargassum extract was tested. Sargassum seaweed contains reductive, antioxidative polyphenols that show promise in stabilizing ROS. This study proposes medicinal viability for this increasingly-beached seaweed as a capable agent for inhibiting ROS. Regenerating planaria were introduced to varying concentrations of a polyphenol extract and their condition was monitored through (1) dO2 concentrations, (2) light microscopy (LM) to track movement, and (3) scanning electron microscopy (SEM) to quantify epidermal structures. Final data was corroborative and determined that the group introduced to the least concentrated extract (Sarg3) and the unmodified regeneration control (CtrlC) were the most similar: dO2, recorded displacement, and number of specific epidermal structures. Deviation from CtrlC observed in planaria introduced to the most concentrated extract (Sarg1) also suggests Sargassum has modulating potential. Thus, there may be comparable implications for human inflammation.

Awards Won:
Second Award of $2,000