

Training U.S. NOAA and College of Charleston



Coral pathology is a growing interest since its recognition as an important tool in coral conservation. Corals are dying from infectious diseases and toxicities associated with pollution. In order to mitigate declines in coral populations, the pathologies experienced by corals need to be understood.

Functional pathology is the study of the decrease in the performance of a specific organ, tissue, or metabolic pathway. In human and veterinary medicine, clinical diagnostic assays or “biomarkers” are often used to gauge the condition of a functional process. For example, cardiac troponin I found in the blood stream is an indication of damage to heart tissue. Heart cells are damaged, break open, and release the troponin I protein into the blood stream. The more troponin there is in the blood stream, the more damage to the heart.



In the same way, coral biologists are developing and using markers that reflect the condition of different aspects of coral physiology and cellular physiology. Changes in a biomarker are indicative of changes in a functional pathway.

Haereticus was given the opportunity to train two laboratories (College of Charleston and U.S. National Oceanic and Atmospheric Administration) in conducting several types of biomarker assays on a species of coral obtained from the Bahamas. The coral, *Porites asteroides*, was inspected for possible sponge and endolithic algae contamination (Fig. 1). The coral tissue was excised from these contaminants (Fig. 2) and ground to a frozen powder in a mortar and pestle that has been chilled with liquid nitrogen (Fig. 3). Sample was extracted using different buffers (Fig. 4) and assayed for uroporphyrin content, an important biomarker that is indicative of adverse function of porphyrin synthesis pathway. Porphyrins are important components of hemoglobin and cytochromes.



This training was conducted at the Hollings Marine Laboratory in Charleston, South Carolina (Fig. 5).

