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Department of Marine Sciences
Presents a Seminar by

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Comparative Metatranscriptomics of Coral Bleaching

Coral holobionts (i.e. the coral host and its microbial assemblages) have different member composition across the scleractinian tree. These differences can have disparate consequences for holobiont members under different environmental conditions. Coral microbial assemblages cohabiting within a holobiont exist as a dynamic network of interactions driven by the emerging metabolic, physiological and ecological capacities of all members. Algal symbionts with different physiological adaptations to light and temperature are known to shift in abundance within a host in response to thermal stress over months to years. Coral associated prokaryotic microbial assemblages not only have very fast generation times, but their community composition can shift rapidly under bleaching conditions.

Coral holobiont responses to heat stress are the product of life history and local adaptation to specific environmental parameters unique to each coral species. Heat stress and/or bleaching gene expression baseline and trajectory for each holobiont is reflected in different levels of heat sensitivity. To understand whether there is a similar holobiont response to thermal stress across different coral phylogenetic divergences, we have performed the same bleaching experiment in three different species. We define the holobiont meta-transcriptional and metabolic capabilities in response to elevated temperature.

Our results show functional evidence that coexistent coral holobiont associates display different responses and metabolic capabilities under high temperature stress. We find that each member has a unique response that can influence the holobiont's ability to cope with thermal stress. Resistance observed in robust coral holobionts may be explained by the redundancy and the maintenance of key metabolic pathways from different holobiont members and by an increasing richness and diversity in likely thermotolerant microbial communities. These microbial functional contributions to coral holobiont can have conspicuous evolutionary and ecological outcomes under climate change. Bleaching is a complex combined response characterized by the holobiont members' multiple interactions.

Host: Senjie Lin
Time & Date: 11:00 am, Friday, April 27, 2018
Place: Marine Sciences Building, Seminar Room 103

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