

南方海洋科學與工程廣東省實驗室（廣州）香港分部  
HONG KONG BRANCH OF SOUTHERN MARINE SCIENCE AND  
ENGINEERING GUANGDONG LABORATORY (GUANGZHOU)

## Hong Kong Branch Seminar Series

### Marine Ecosystem Health and Safety



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**University of Haifa**

**Title: Mortality – and survival through  
microbial interactions - in abundant  
marine cyanobacteria**



Abstract: The ability of microorganisms to withstand long periods of nutrient starvation, and not die, is key to their survival and success under the fluctuating conditions common in nature. Therefore, one would expect starvation resistance to be prevalent among organisms in the nutrient-poor open ocean. Surprisingly, this is not the case for *Prochlorococcus*, the most abundant photosynthetic organisms in the oceans, which is responsible for ~5% of global primary production. When starved for nutrients, *Prochlorococcus* undergo a process called chlorosis, which in other cyanobacteria leads to the production of resistant resting stages. However, chlorotic *Prochlorococcus* cells are not resting stages – they are dead. The secret for *Prochlorococcus* survival (at least under laboratory conditions) lies in its interactions with co-occurring heterotrophic bacteria, such as *Alteromonas*, which stabilize the cell physiology and macromolecular structure during starvation. We propose that reliance on co-occurring heterotrophic bacteria, rather than the ability to survive extended starvation as resting cells, underlies the ecological success of *Prochlorococcus*. More generally, our results highlight the lack of fundamental understanding of the process of cell death, which we propose is a major “black box” in microbial physiology and ecology.

**30 November 2020 (Monday) | 16:00pm-17:00pm  
(GMT +8)**

**<https://hkust.zoom.us/j/2074605139>**

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