Drivers of bacterial and viral communities in the Southern Ocean

Thulani P. Makhalanyane[1,2*]

1. DSI/NRF SARChI in Marine Microbiomics, Department of Biochemistry, Genetics and Microbiology, University of Pretoria, Pretoria, South Africa
2. Microbiome@UP, Department of Biochemistry, Genetics and Microbiology, University of Pretoria, Pretoria, South Africa

[*]E-mail: thulani.makhalanyane@up.ac.za

Climate change is leading to unprecedented shifts in terrestrial and marine environments. Due in part to its proximity to Antarctica, the Southern Ocean is a unique and ecologically important region. While several studies have provided important insights regarding the ecology of macrofauna, we lack comparative insights regarding microbial communities. In this presentation, I will detail some of our work on Southern Ocean microbial communities using amplicon and shotgun sequencing approaches. Our results show that environmental factors such as temperature, salinity, depth, and water masses substantially shape the diversity and function of microbial communities including viruses. I will cover some of the recent insights regarding the biogeography of these microbial communities and highlight the effect of spatial variability on these microbial communities. Based on our most recent metagenomic data, using Marine Snow Catchers, we show the direct contribution of microbial communities as mediators of carbon and nitrogen cycling. Taken together, the data show the centrality of microbial communities to ecosystem services in the Southern Ocean.