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## The TEMPLE of LIFE in the west Antarctic seas: from microbes to iconic animals (TEMPLE LIFE)

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## ABSTRACT

The Southern Ocean and its regional seas are sensitive to alterations induced by global climate change and its play a profound role in regulating global carbon cycles, accounting for approximately 20–30% of global ocean CO2 uptake. The West Antarctic Ice Sheet (WAIS) is one of the largest potential sources of future sea-level rise, with glaciers draining the WAIS thinning at an accelerating rate over the past 40 years. Widespread ice sheet/shelf thinning will likely have influence on biogeochemical cycling through ocean productivity, carbon reservoirs and carbon sequestration, in addition to sea ice and ocean circulation changes, and biota distribution. Under such conditions, heterotrophic bacteria play a key role in marine carbon cycling, with their enzymatic hydrolysis and remineralization processes, and understanding their physiological activities in polar systems is important for considering climate change impacts there, both on the climate and on the food web. TEMPLE LIFE project aims at expanding the marine Antarctic study area of the ongoing project SIGNATURE funded by the Italian National Antarctic Research Program (PNRA). Therefore, the vessel time of the cruise selected in the present project proposal will overlap with that foreseen in the same year and month of the SIGNATURE oceanographic cruise in the Ross Sea, and will allow to study synoptically in a wider area of the Southern Ocean, the habitat template, microbial signatures and iconic life in the west Antarctic seas. As a twin of the SIGNATURE project, TEMPLE LIFE will operate with a multidisciplinary approach, making use of common protocols. Emphasis of the TEMPLE LIFE project will be devoted to focusing on hydrography, carbon remineralization, microbial ecosystem functioning, and iconic life.