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The Unseen Majority: Can Microorganisms Save Us



Rick Cavicchioli is a Professor in the School of Biotechnology and Biomolecular Sciences at UNSW.

His research group studies the molecular mechanisms of adaptation of environmental microorganisms. Research focuses on cold adaptation of microorganisms that represent the 3rd domain of life (the Archaea), and the adaptation of marine bacteria to low nutrient (oligotrophic) conditions.

The studies particularly involve the use of genomics. In addition to studies of individual model microorganisms, the group performs genome-based studies of whole microbial ecosystems (metagenomics), including lakes in the Vestfold Hills region of Antarctica and regions of Heard Island, and transects across the Southern Ocean.

The large ecosystem based studies represent major collaborative efforts with national (e.g. Australian Antarctic Division) and overseas groups (e.g. J. Craig Venter Institute and US DOE Joint Genome Institute).

The focus on cold and extreme adaptation has also served to foster a biotechnology program aimed at developing enzymes with enhanced performances, with applications to a broad range of industries (e.g. water recycling).