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Insights: Publications

Tuning purple bacteria salt-tolerance for photobioelectrochemical systems in saline environments

Faraday Discussions 215, 15-25

January 1, 2019

Written by

The development of photobioelectrochemical systems is an exciting field requiring a combination of electrochemical, biological and material science knowledge. One of the main advantages of applying anoxygenic photosynthetic microorganisms versus non-photosynthetic bacteria is the possibility to utilize sunlight as the energy source, while removing organic contaminants from a solution. Since bacterial cells utilize energy to maintain the intracellular osmolarity, bacterial species that do not rely on organic species as an energy source have an advantage over species requiring them for their sustainment. Herein, we discuss the possible use of Rhodobacter capsulatus, an extremely versatile photosynthetic purple bacteria, for application in environments within a range of low to moderately high salinity (0–25 g L−1 NaCl). Bacterial cells' capability to adapt to changing salinity, and effects on bioelectrochemical performance will be presented, as well as major drawbacks and research needs to drive future efforts and discussions.