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Towards Crystals of Proteorhodopsin. P. Gourdon, R. Berntsson, N. Bonander, A. Snijder, R. Neutze, Dept. of Chemistry and Biotechnology, Chalmers Univ. of Technology, 413 90 Gothenburg, Sweden.

Membrane proteins are associated with many important biological functions. There is only a limited knowledge of the 3D structures and the reaction cycles of membrane proteins. We are presently seeking conditions that yield crystals of the membrane protein proteorhodopsin. This rhodopsin, related to G protein coupled receptors, was discovered in seawater in year 2000. It is thought to participate in creating the proton motive force, which is involved in energy metabolism. Thus, proteorhodopsin may play an important role in the energy balance of the earth's biosphere. Although the structure of at least three archeal rhodopsins have been obtained by X-ray crystallography, no homologue from the kingdom of bacteria has ever been structurally characterised. Here we present results from a successful expression, isolation, solubilisation, and a three-step purification procedure. We also show preliminary crystallisation results. The ultimate goal of this research includes the elucidation of structure-function relationships of these enzymes by determining reaction intermediates.