AvH7-27
7th Alexander von Humboldt International Conference
Penang, Malaysia, June 20-24, 2011

Inorganic carbon uptake mechanisms in the coccolithophore *Emiliania huxleyi*: The Molecular Basis

L.C.M. Mackinder (1,2), L.T Bach (1), K.G Schulz (1), G Wheeler (2,3), D Schroeder (2), U Riebesell (1), and C Brownlee (2)

(1) IFM-GEOMAR, Kiel, Germany (lmackinder@ifm-geomar.de), (2) Marine Biological Association, The Laboratory, Citadel Hill, Plymouth, UK , (3) Plymouth Marine Laboratory, Prospect Place, Plymouth, UK

The mechanism of dissolved inorganic carbon (DIC) acquisition in coccolithophores is relatively unknown. By culturing *Emiliania huxleyi* at constant CO_2, constant pH and constant alkalinity we can start to disentangle the individual components of the carbonate system (CO_2, HCO_3^-, CO_3^{2-} and pH) and understand their importance in coccolithophore biology. The physiological effects of these changes including growth rates, calcification rates and stable isotope fractionation are discussed in the accompanying abstract (Inorganic carbon uptake mechanisms in the coccolithophore *Emiliania huxleyi*: The Physiological Basis). This study probes the gene expression of putatively key inorganic carbon and proton transport genes of cells cultured at constant CO_2 varying DIC/pH and constant pH varying CO_2/DIC. The gene expression profiles of target genes including several carbonic anhydrases, HCO_3^- transporters, proton pumps and proton driven exchangers are investigated using quantitative reverse transcription PCR. Preliminary data indicates up-regulation of a putative bicarbonate transporter at limiting DIC and DIC dependent carbonic anhydrase expression. The resulting data is put into context with the physiological results providing key insights into inorganic carbon uptake in *E. huxleyi*.