Michaela Mauß

Unraveling the (bio)chemical processes involved in phytoplankton-virus interactions

Viruses, by far the most abundant entities in the ocean, have been noticed to play a crucial role in phytoplankton regulation. Due to their lytic activity, marine algal viruses influence phytoplankton dynamics by terminating blooms or acting as diversity regulators. Further, viruses manipulate the pelagic food web by changing nutrient flows from lower to higher trophic levels. Nevertheless, the complex (bio)chemical interactions between viruses and their hosts are not well understood. Employing the marine coccolithophore *Emiliania huxleyi* and its specific viruses as a model system metabolomic investigation will help us to understand signals involved in the infection process. It has been shown that only the diploid life phase of *E. huxleyi* is susceptible to viral infection, whereas the haploid is not. Therefore, we intend to detect metabolic differences between the life phases by the application of GC/MS. In addition the diploid stage was shown to possess an escape strategy during long term viral infection by transforming itself into the haploid form. Co-culture experiments will allow us to determine, if this observed phase shift is triggered by metabolites produced in the presence of the virus. We aim to isolate and identify such infochemicals. Resistance against viral infection also occurs in diploid strains. Immunization experiments and the metabolic comparison of resistant and non-resistant strains during the infection process might help to clarify the ecological costs or the reasons for resistance.

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