Manton session

MANTON.1

BIODIVERSITY, SECONDARY METABOLOME AND ECOLOGICAL ROLE OF FUNGAL ENDOPHYTES ASSOCIATED WITH THE BROWN ALGAE *LAMINARIA DIGITATA, ASCOPHYLLUM NODOSUM, SACCHARINA LATISSIMA* AND *PELVETIA CANALICULATA*

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Morphologically-complex brown algae are colonized by endophytic fungi that do not cause apparent damage on their host. In plants, endophytes protect their host against biotic and abiotic stress, presumably through the production of metabolites. However, in macroalgae, the study of the diversity and the role of endophytic fungi associated with seaweeds are still largely unexplored. In this context, we determined the diversity of culturable fungal endophytes in *Laminaria digitata, Asco phyllum nodosum, Saccharina latissima, Pelvetia caniculata*. 121 fungal strains were thus isolated from algae sampled in France and Scotland, which grouped into more than 40 molecular operational taxonomic units. Selected marine ascomycete strains such as *Dendryphiella* spp were chemically studied and new fungal metabolites were isolated and characterized. In order to evaluating the potential role of fungal endophytes within the symbiosis relationship with their algae host, activity of these fungal metabolites against pathogens of brown algae was tested (*Eurychasma dicksonii, Anisolpidium ectocarpii, Maullinia ectocarpi, Pseumodomonas alginovora, Pseudoalteromonas bacteriolytica*). Some of them exhibited potent antioomycete or antibacterial activities against pathogens suggesting a plausible ecological role in these understudied fungi-algae mutualistic relationships. We are now exploring this concept further *via* the development of tripartite bioassays, where the interaction between the endophyte and some known pathogens will be measured *in vivo*.

MANTON.2

TWO-PHASED CELL POLARISATION IN THE BROWN ALGA *DICTYOTA*

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In most complex eukaryotes development commences with the establishment of cell polarity that determines the first axis of the future body plan. The underlying mechanisms of polarity establishment are still emerging. Using a combination of microscopy, pharmacological experiments and transcriptomic analyses we show that cell polarity in the brown alga *Dictyota* is established in a two-phased process with the first phase narrowing down the possible polarisation vectors to a set of two. Like in land plants, the zygote of *Dictyota* establishes the apical-basal axis during the first cell division. Upon egg activation, the zygote undergoes an F-actin/myosin dependent, 90s lasting elongation along a maternally determined axis that is reflected in the cytoplasmic distribution of plastids. Which of the two poles of the resulting prolate spheroidal zygote will acquire the basal cell fate, is determined environmentally as assessed by the direction of unilateral light. The second phase is accompanied and dependent on zygotic transcription instead of uniquely on maternal factors. In that embryogenesis in brown algal plant systems is more similar to higher plants rather than animal system. Cell polarisation as observed in *Dictyota* whereby determination of direction and sense of the polarisation vector are mechanistically and temporally decoupled, in two distinct processes is unique.