

Building the algal biotechnology sector

John G Day

Culture Collection of Algae and Protozoa, Scottish Association for Marine Science (SAMS), Scottish Marine Institute, Oban, PA37 1QA, UK

Abstract

Algae are not a simple group of aquatic organisms, in reality they have been unilaterally “lumped together” based on their “aquatic nature” and capacity to photosynthesise... They are from phenotypic, phylogenetic, ecological and functional perspectives hugely diverse organisms and in comparison to those conventionally employed in biotechnology, (classically well-studied taxa including bacteria such as *Escherichia coli* and yeast including *Saccharomyces cerevisiae*), they are relatively poorly studied... It is this diversity, in both microalgae and seaweeds, along with their capacity for photosynthesis, which provides opportunities for biotechnological exploitation. Although there are a variety of historical examples of commercial exploitation of algae, much of the potential has yet to be realised and this will be discussed in the talk. A key factor that will be highlighted is that over the past 15 years, we have had a phase of unparalleled R&D focussing on algae, and are on the brink of a new biotechnological revolution with applications of algal-derived biological-resources as varied as new pharma, cosmeceuticals, nutraceuticals, functional foods and future biofuels. I will briefly outline the current status of algal biotechnology and how the work at SAMS, associated with Culture Collection of Algae and Protozoa (CCAP), is underpinning and driving the development of this rapidly expanding sector in the UK and internationally.

Brief biography



My first degree was in microbiology at Dundee University, where I became interested in algal biotechnology. I subsequently worked on the excretion of metabolites by immobilized photo-autotrophs in Prof Geoff Codd's lab (also at Dundee Univ.) for my PhD (1987). I then worked in a Biotech start-up on Cambridge Science Park, utilizing the heterotrophic capabilities of some algae to mass cultivate them for use in aquaculture feeds. In 1990 I moved to the North of England working at the Institute of Freshwater Ecology, subsequently rebranded as CEH Windermere, and in 2004 I relocated and merged the freshwater and marine subsections of Culture Collection of Algae and Protozoa (CCAP) at SAMS (Oban). I have spent much of the past 25 years working in the fields of biological resource conservation and exploitation, being head of the Culture the CCAP from 2008-2015. I was awarded a personal chair (2015), by the University of the Highlands and Islands (UHI) for my work on the conservation of biological resources. I have wide ranging interests in algae and protozoa and current interests include: Biological Resource Centres (BRC), cryopreservation, cryoinjury, algal stress physiology, algal biotechnology, algal biofuels, bioremediation employing algae, the application of molecular method in culture collections, bioinformatics and networking.