



**Algarve Centre
of Marine Sciences**

CCMAR

**Invited
Speaker**

Genomics of Marine Organisms

"Revealing the Molecular Secrets of Marine Diatoms"

Dr. Chris Bowler

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Published recently in *Nature Biotechnology*, *Science* and *Molecular Cell*

Diatoms are eukaryotic algae found throughout marine and freshwater ecosystems that are responsible for around 20% of global primary productivity. A defining feature of diatoms is their ornately patterned silicified cell wall, which display species-specific nanoscale-structures. These organisms therefore play major roles in global carbon and silicon cycles. The marine pennate diatom *Phaeodactylum tricornutum* is the second diatom for which a whole genome sequence has been generated. It was chosen primarily because of the superior genetic resources available for this diatom, and because it has been used in laboratory-based studies of diatom physiology for several decades. Although not considered to be of great ecological significance, it has been found in several locations around the world, typically in coastal areas with wide fluctuations in salinity. Unlike other diatoms it can exist in different morphotypes, and changes in cell shape can be stimulated by environmental conditions. This feature can be used to explore the molecular basis of cell shape control and morphogenesis. Furthermore the species can grow in the absence of silicon, and the biogenesis of silicified frustules is facultative, thereby providing opportunities for experimental exploration of silicon-based nanofabrication in diatoms. The sequence is 27 mega base pairs and, together with the sequence from the centric diatom *Thalassiosira pseudonana* (34 Mbp), it provides the basis for comparative and functional genomics studies of diatoms with other eukaryotes and provides a foundation for interpreting the ecological success of these organisms. A summary of new research findings concerning these aspects will be presented.

**8 Fev.
10:30 h
Sala de
seminários
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