



CIIMAR Internal Presentations

31st May 2007, Thursday

14:30 - 14:45

Olga Maria Lage, Laboratory of Ecotoxicology "Augusto Nobre" (LEAN), CIIMAR
Discovering Planctomycetes

14:45 - 15:00

Joana Bondoso, Laboratory of Ecotoxicology "Augusto Nobre" (LEAN), CIIMAR
Fingerprinting methods for the assessment of Planctomycetes diversity

ABSTRACTS

DISCOVERING *PLANCTOMYCETES*

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Planctomycetes are a fascinating group of budding Bacteria characterised by membrane-bounded compartments within the cell and absence of peptidoglycan in the cell walls. Due to their wide range of habitats and physiological diversity, they play an important role in the ecosystems. Despite the reported widespread distribution of *Planctomycetes*, precise knowledge of their ecological role in the environment is still very much unknown, mostly because of the relatively few species present in pure culture. Even though several genomes of *Planctomycetes*, including that of *Rhodopirellula baltica*, have been published or are under current sequencing, there is a need for functional analysis on the transcriptional and proteomic level in order to define which of



the predicted genes can be expressed in principle and the physiological conditions inducing their expression and foresee the function of undefined genes.

In my presentation, I will give a general idea of what *Planctomyces* are, why am I studying them and, finally, I'll show part of the work that we have already obtained. In the last two years, we have been isolating in pure culture new strains of *Planctomyces* (more than fifty), some of them most probably new species of existing genus and even new genus, that are now part of the OJF *Planctomyces* culture collection. The majority are from marine environments on the north Atlantic coast of Portugal and from the surface of macroalgae. In fact, we have proved this epiphytic association. Many of our isolates are under morphologic, ultrastructural, biochemical and physiologic characterization. Furthermore, DNA molecular studies, mainly the 16S rRNA gene, are being done for taxonomic identification and phylogeny.

ASSESSMENT OF *PLANCTOMYCETES* DIVERSITY BY FINGERPRINTING METHODS

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The *Planctomyces* are a recent re-discovered group of budding bacteria. Regarding the diversity and phylogeny of this fascinating group there is still a gap in knowledge to be fulfilled. The existing *Planctomyces* sequences of the 16S rRNA gene in GenBank show a higher diversity when compared to the isolated existing species. The work developed at our lab aims to increase the number of species present in pure culture which enables further studies to achieve a better understanding of this intriguing group of bacteria. More than 200 strains have been already isolated and their diversity is being assessed by the 16S rDNA analysis because colony and cell morphology, as assessed by optical microscopy, are not enough to allow taxonomic distinction. However, even that analysis can fail to differentiate at the species level (Stackebrandt & Goebel, 1994). DNA fingerprinting methods have been used with success for genotyping several types of bacteria, especially in the field of medical microbiology. Here, we report the use of PCR-based DNA-fingerprinting methods, like Multi Locus Sequence Analysis (MLSA) and Box-PCR that have been successfully applied to some of our strains. Pulse Field Gel



Electrophoresis was performed as a method to analyse the macrorestriction of the whole genome of the strains in study. The complete sequence of the 16S rRNA gene was also determined.

The techniques used gave similar results, proving their reliability and complemented the 16S rDNA analysis on the correct intra and inter- species differentiation.

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