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Do sphingolipid-enriched domains in fungi control plasma membrane organization and antifungal interaction?

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Abstract:

This seminar will be focused on sphingolipid-enriched domains (SLEDs) which are a specific feature of fungal membranes. The presence of SLEDs, first identified by our group in the yeast Saccharomyces cerevisiae, is now established in different fungal species. Sphingolipids are major lipid components of the plasma membrane of eukaryotes, but unlike glycerophospholipids, are structurally very different between fungi and mammals. Focusing on these structural differences, the impact of changing sphingolipid structure on lipid domains, membrane protein compartmentalization, and membrane interactions with antifungal agents will be described. To do so, different biophysical approaches have been employed in living cell membranes, reconstituted systems, and membrane model systems. In this presentation, emphasis will be given to the results obtained through time-resolved fluorescence spectroscopy and microscopy.

Bibliographic note:

Rodrigo F. M. de Almeida, PhD, is head of the Molecular Biophysics Laboratory at Centro de Química Estrutural and teaches Biochemistry at the Department of Chemistry and Biochemistry, Faculdade de Ciências da Universidade de Lisboa (FCUL).

He graduated in Biochemistry in 1999 at Universidade de Lisboa and, in 2004, obtained his PhD in Chemistry, under supervision of Prof. Manuel Prieto and co-supervision of Prof. Luís Loura, by the Technical University of Lisbon. His doctoral work at Centro de Química-Física Molecular was devoted to the study of lipid phase separation and lipid-protein interactions levered by in-depth use of fluorescence spectroscopy. He was a post-doc fellow at the Biochemistry Department and Microspectroscopy Centre, Wageningen University (The Netherlands; Prof. Ton Visser) where he became acquainted with several fluorescence microscopic techniques. After a short post-doc between Lisbon and Universidad Miguel Hernández mainly dedicated to SARS-CoV spike protein, he launched, in 2008, his research group at FCUL, where he continues to work. In this period, he started to explore living yeast cell membrane, which led him to uncover the presence of physiological gel domains in the plasma membrane of Saccharomyces cerevisiae.

Currently, his research is focused on lipid and protein organization in the plasma membrane of fungi and new antifungal therapies. He collaborates with other groups in the elucidation of the mechanisms of action and therapeutic potential of new compounds, with particular emphasis on polyphenols and antitubercular agents.

Molecular Biophysics Laboratory's website: http://bmn.cqb.fc.ul.pt/