

Lipid specificity plays a role in the interactions between bioactive molecules and plasma membranes

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Abstract (not more than 300 words)

Plasma membranes are complex entities common to all living cells. The interactions between bioactive molecules, especially antimicrobial molecules, and the lipids composing plasma membranes, are important for many processes, such as the bioavailability of certain drugs or viral fusion. The cell membrane is a balanced environment and any change in its structure by an antimicrobial molecule must be considered in conjunction with the overall effect this may have on the function and integrity of the membrane. As a general concept, understanding at the molecular level, the mechanism by which bioactive molecules interact with cell membranes is therefore of fundamental importance.

The lipid specificity of the interaction is a key factor for the detailed understanding of the penetration and / or activity of lipid-interacting molecules and the mechanisms of certain diseases. Further research in this area is expected to enhance drug discovery and the development of membrane-active molecules for many areas such as health, plant protection or microbiology.

In this presentation, some "in vitro" and "in silico" complementary biophysical techniques useful to obtain information on the specificity of lipids on a molecular scale will be exposed. The approach used will be illustrated by a study carried out on a cyclic lipopeptide, surfactin, which has properties that elicit the plant's defense mechanisms.

Professional Biography (100-150 words)

Magali Deleu is FNRS Senior Research Associate in the Laboratory of Molecular Biophysics at Interfaces at the Gembloux Agro-Bio Tech faculty of the University of Liège. After completing a doctoral thesis in 2000, focusing on the study of interfacial and emulsifying properties of biosourced amphiphilic molecules, she turned to the study of the properties of membrane interactions of this type of molecules. In this context, she completed a postdoc in 2003-2004 at the University of Lund to acquire in-depth knowledge in biophysics. Since 2013, Magali Deleu's team has joined that of Laurence Lins to study, at the molecular level, the mechanisms involved in the insertion/interaction of surfactants or peptides in biological membranes with regard to agronomic applications and human health. In particular, structure-function relationships and lipid specificity of interactions are studied. This research is done in close collaboration with biologists, biochemists and synthetic chemists at national and international level.



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