

How biophysics can help to decipher lipid-driven biological mechanisms of surfactins, a class of bacterial lipopeptides

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Surfactins (SRFs), a class of natural lipopeptides produced by *Bacillus* sp., present a broad range of biological properties such as antibacterial, antitumoral, antiviral, and antimycoplasmic activities. In addition to these biocidal activities, SRFs also show an ability to stimulate plant defense for stronger resistance against pathogens, which makes them a promising alternative to chemical compounds for plant protection in sustainable agriculture.

Biological activities of SRFs are due to their capacity to interact with lipid bilayers constituting the cellular membranes.

While antibacterial and haemolytic activities of SRFs can be explained by their membrane permeabilizing effect, other biological activities such as their antiviral and plant immunostimulating activities relate to another more subtil mechanism.

In this communication, we will present how an integrative biophysical approach using biomimetic lipid membranes can be applicable to decipher the molecular mechanism behind the antiviral and plant immunostimulating activities of SRFs.