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Abstract

Antimicrobial: Arginine and Lysine Conjugated Rhamnolipids †

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Published: 7 November 2017

The rapid increase of multiple drug resistant bacteria and fungi poses a serious threat to society. Therefore, there is an urgent need to design new antimicrobial compounds that impede the development of acquired resistance. One possible strategy is the preparation of new antimicrobial compounds with novel modes of action and different targets.

Biosurfactants are surface active molecules that are produced by a variety of different microorganisms. Rhamnolipids produced by *Pseudomonas aeruginosa* are a mixture of mono-rhamnolipids and di-rhamnolipids. Mono-rhamnolipids and di-rhamnolipids consist of one or two molecules of rhamnose functionalized with one or two hydroxy fatty acids of different length. Rhamnolipids have the two main properties of surfactants, that is, strong surface activity and self-assembly in water.

With the aim of obtaining new antimicrobial compounds, we have synthesized new molecules that structurally consist of one molecule of rhamnolipid linked to one arginine or lysine. A simple procedure was used to obtain the new molecules. The new molecules were prepared by linking the α-NH_2 of the methylated arginine or lysine to the carboxyl terminus of the rhamnolipids. The introduction of the amino acids gives cationic character to the new rhamnolipid derivatives. After the synthesis, these compounds were assayed to ascertain their antimicrobial and hemolytic activity.

Acknowledgments: Thanks to all the collaborators involved and to the Ministry of Economy and Competitiveness, with the consolidated group of Biotechnology and Bioremediación 2014SGR534 of the Generalitat de Catalunya for financing the project.