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Identification of new inducing signals of the MdtABC resistance-nodulation-cell division multidrug efflux pump

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One of the most relevant antimicrobial resistance mechanisms of gram-negative bacterial pathogens involves active efflux of clinically important agents by multidrug transporters from the Resistance-nodulation-cell division (RND) family. Polyselectivity of RND efflux pumps is of concern for the development of efficient drugs and inhibitors that act against the functioning and/or expression of these transporters. Using an *in vivo* insect infection model and reporter gene technology coupled to an *ex vivo* approach, we showed that the entomopathogenic enterobacteria *Photorhabdus luminescens* highly induce the expression of the MdtABC efflux pump in a tissue-specific manner and in response to proteolysis by-products during late infection stages. We are currently working on purifying such signal molecules. These findings provide a new evidence that interference with bacterial virulence and/or signal transduction pathways is an especially compelling approach, as it is thought to apply less selective pressure for the development of bacterial resistance than traditional

strategies, which are aimed at killing bacteria or preventing their growth. They should also pave the rational development of an improved new generation of efflux pump inhibitors that can competitively repress RND pumps expression rather than their blockage in order to overcome multidrug-resistance in gram-negative bacteria.

Speaker Biography

Abi Khattar Z has completed his PhD at the age of 27 years from University of Montpellier, France and Saint Joseph University, Beirut, Lebanon. He is a research associate professor in microbiology/parasitology and the coordinator of the master program in applied microbiology at the Faculty of Science of the Lebanese University. He has just founded his own research team in microbiology in the L2GE laboratory where he is co supervising two PhD theses in collaboration with research teams from "INRA" and "CNRS" in Montpellier and Paris-Orsay in France. He has over 4 publications that have been cited over 90 times, and his publication H-index is 3.

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