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From ecology to bacterial resistance to antibiotics-Impact of chemical stress and role of efflux pumps

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The resistance of bacteria to antibiotics has been declared by the WHO as a major public health issue since 2014. Indeed, the list of bacteria capable of resisting almost all available antibiotic molecules is growing. For a long time this problem has been linked to the misuse of antibiotics and has been limited to the hospital environment. More recently, it has integrated human activities (industrial environments, etc.) and agricultural environments. Thus the role of the environment as a source but also in the transmission of antibiotic resistance raises many questions. In the fight of the antibiotic resistance spread, it is currently impossible to limit vision simply to the aspect of human or animal health. Indeed, all ecosystems are linked (human, animal, environment). It is therefore essential to analyze the situation in a global "One Health" context integrating the issue of antimicrobial resistance in all these ecosystems. It is therefore essential to increase the field of knowledge on the environmental factors that could be involved in the phenomenon of antibiotic resistance and its dispersion. There are particularly favorable environments for the dispersal of multidrug resistance, such as all areas of strong human activity (mining areas ...) and farms. It is recognized that in these areas pollution by organic waste, metallic trace elements, are all factors triggering adaptation mechanisms developed by microorganisms. But what about the role of plants and their metabolites in this environment?. In this context of antimicrobial resistance plants metabolites can be considered according to different aspects. Present in the soil, they can be considered in the same way as other environmental factors that can impact the structure of soil bacterial communities. Isolated, these metabolites can have antimicrobial activities in the search for new antibiotics. And finally, others can act on the resistance mechanisms in these particular environments.

Biography

Dijoux-Franca Marie-Genevieve has completed her PhD in Chemistry of Natural Compounds at Champagne-Ardenne University and Postdoctoral studies from NIH-Fort Detrick, Frederick MD, USA. She works as a Professor of Botanical Pharmacy and Phytochemistry at University Lyon 1. She has published more than 63 papers dealing with natural compounds and their impacts on biological systems. Since 2006, she joined the Laboratory of Microbial Ecology. Her research scope is the role of natural compounds in environmental multiresistance, their impact on efflux pumps and their potent activities as MDR reversion.

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