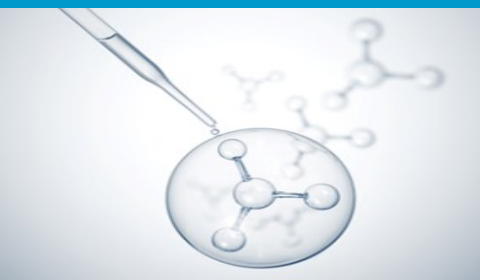


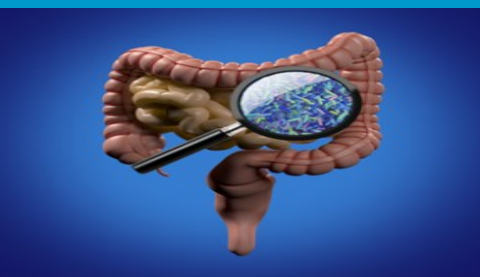
September 22-24 2022, The Royal Hotel, Hammamet, Tunisia



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THIRD INTERNATIONAL SYMPOSIUM ON NATURAL ANTIMICROBIALS:



Current status, challenges and perspectives



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ANTIMICROBIAL RESISTANCE FROM THE ONE HEALTH PERSPECTIVE. THE CASE OF METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS*

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Antimicrobial resistance (AMR) is a global problem which has increased enormously in recent years, compromising the treatment of infections in humans and animals. *Staphylococcus aureus* is a commensal microorganism in humans and many animals, but is also an important opportunistic pathogen, representing methicillin resistant isolates (MRSA), a serious clinical problem. The resistance mechanism involved in most cases is *mecA*-related (encodes PBP2a).

Since 2005 it has been evidenced the emergence of MRSA variants associated with the animal field, and especially with livestock (called LA-MRSA), that are having a great impact on public health. One of the most relevant genetic lineages within LA-MRSA is CC398, mainly related with pigs, although it can also be detected in other farm animals (chickens, turkey, cattle ...), and can even be found in free-living animals or in environmental samples. MRSA-CC398 has also been frequently detected in food samples of animal origin (pig, poultry...). The MRSA-CC398 clone can colonize and cause infections in humans, especially in people with professional contact with farm animals (specially pigs) but is also increasingly reported in patients with other types of animal's contacts or without this risk factor. This genetic lineage is especially common in hospitals located in geographical areas with high pig-farming density, and studies related to other farming activities (poultry, cows) are also ongoing. The study of LA-MRSA in the human, animal and environmental environments is an important model to understand the dimension of the One Health approach and will be analyzed through the research on MRSA ST398 carried out by the OneHealth-UR research group. The situation in other countries and continents will also be analyzed.

On the other hand, in 2011 a new mechanism of resistance to methicillin in *S. aureus*, called *mecC*, was described, which encodes the protein PBP2c. MRSA strains with the *mecC* mechanism were initially detected in cattle and people in the livestock environment in the UK. In the following years, MRSA-*mecC* strains were detected sporadically in other food-producing animals and in rare cases of human infections. Nevertheless, different studies, some of them of the OneHealth-UR research group, have shown that MRSA-*mecC* is mostly detected in the wildlife (red deer, hedgehog, wild rabbits, ...), with some sporadic cases in farm animals and humans. Data in this topic of the OneHealth group will be shown together with research of other groups, what will allow to analyze evolutive aspects of the MRSA lineages that are in the human-animal interface.