Synthesis and conclusions of the hepta-academic conference *of June 15, 2022*
"One health: sharing microbes and antibiotic resistance

Over the past ten years, the inter-academy watch group on antibiotic resistance has brought together a growing number of motivated partners, including seven academies in 2022. While supporting the governmental plans to avoid therapeutic impasses, this watch also aims to draw attention to little-known aspects of antimicrobial resistance and to bring closer professions committed to action by providing them with a broader field of vision that makes them better able to formulate relevant questions and to identify original avenues for progress.

Part of the information provided by the watch group is delivered during multi-academic conferences that are devoted to the knowledge of the mechanisms of diffusion of resistant pathogenic bacteria and of antibiotics. These conferences point out avenues of progress intended to prevent this diffusion and to reduce the resulting risks for man, animal, and the environment.

- The spread of resistant bacteria and of their resistance genes to humans, animals, and the environment, resulting in real "underground epidemics", must be included in the list of major ecological threats that are part of the "One Health" register (global warming, water pollution, reduction of biodiversity, etc.). The prevention of this spread must be based on a health ecology approach that recommends global, concerted, and multidisciplinary action integrating human, animal and ecosystem health. In addition to reducing the selection pressure of antibiotics, strategies should include **the prevention of cross-transmission of resistant bacteria between humans and animals (hygiene) and the control of wastewater to prevent their dissemination in the environment**.

- Molecular markers of great diversity are an important tool for the "One Health" monitoring of antibiotic resistance. A global approach to antimicrobial resistance under the guidance of major international organizations is possible for all ecosystems and in all countries. Particular attention should be paid to **limiting the release of drug residues (including antibiotics) into the environment, as well as the release of resistant bacteria.**

- It will be necessary to promote more stringent treatment methods to control antibiotic resistance, in order to limit its spread in the natural environment, and to continue the harmonization of monitoring methodologies in conjunction with the health authorities; it will also be necessary to encourage campaigns to **measure resistance genes throughout the wastewater and products of the sludge treatment chain** in order to better understand their

contribution to antibiotic resistance, and to establish a clear picture of the risks associated with water, and the role of environment in transmission mechanisms. The existence of naturally multi-resistant land-based bacteria such as Burkholderia pseudomallei requires a very early identification of the agents of serious community infections.

- It also will be essential to better identify and document the situations of transmission of antibiotic resistance within the different animal species and the food chain. This could lead to **more targeted controls of some so-called sentinel bacterial species during international exchanges**. However, various zoonoses characterized by their environmental aspect still escape antibiotic resistance, such as borreliosis.

- In humans, the transmission of pathogenic bacteria by airborne has been known for a long time and is still relevant. **Wearing a mask could be recommended for acute or chronic infections**, even benign ones of the oro-pharyngeal sphere.

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