Antibiotics Are No Longer Enough: The Patient Is Key

A project working towards a paradigm shift in traditional medicine: infections require an integrated approach

For decades, starting from the post-war era, medicine has relied on antibiotics to combat all types of infections, regardless of whether they were caused by viruses, bacteria, or fungi. Once the microorganism deemed responsible was identified, antibiotic therapy was prescribed, and that seemed to solve the issue. However, today the paradigm is changing. Recent research has revealed that the patient's individual factors—specifically their capacity to resist a given infection—must also be considered. Furthermore, antibiotics alone can sometimes even be harmful, particularly when antimicrobial resistance develops. It is time to adopt a transdisciplinary approach to identify personalized therapies that consider the so-called "host-pathogen relationship," aiming to improve the prognosis and survival of patients at risk of infection. This is the focus of the "HDM-FUN" project, a Horizon 2020 initiative with €10 million in funding, coordinated by Radboud University Nijmegen in the Netherlands, with the Department of Experimental Medicine at the University of Perugia as a key partner. The project builds upon and naturally progresses previous findings from preclinical models of fungal infections, which remain associated with unacceptably high mortality and morbidity rates. Professor Luigina Romani, the project leader at the University of Perugia and one of Europe's pioneers in this approach, emphasizes its significance. The project's initial goal is to identify patient-specific factors, primarily the quality of their immune response and the state of their intestinal and pulmonary microbiota, that contribute to the risk of fungal infections in various intensive care cohorts. These cohorts include, given the current circumstances, patients with SARS-CoV-2 or influenza infections. This knowledge is crucial for designing subsequent therapies aimed at restoring immune functionality to enhance the patient's resistance to infection and optimizing antifungal prophylaxis. In this context, two pioneering clinical studies on "host-directed medicine" are already underway as part of the "HDM-FUN" project. In summary, by the project's completion in 2026, "HDM-FUN" aims not only to propose a complementary strategy to current antifungal treatments but also to lay the conceptual groundwork for a therapeutic breakthrough in infectious disease management. This progress will be made possible through the use of innovative "omics" technologies, such as immunomics, metagenomics, and metabolomics. ■

It is time to implement a transdisciplinary approach to identify customised therapies that can take into account the so-called "host-pathogen relationship" in order to improve prognosis and survival of patients at risk of infection. This is the goal of the "Hdm-Fun" project

Professor Luigina Romani