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EDITORIAL

Early-Career Scientists Shaping the New Microbiology

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One hundred fifty years after Louis Pasteur's germ theory ushered in the "golden age of microbiology" (1), infectious disease research is taking center stage again. The spread of microbes that are resistant to antibiotics (2) is predicted to bring the era of these wonder drugs to an end, with infectious diseases surpassing cancer and cardiovascular disease again as the leading cause of death in high-income countries by the year 2050 (3). Society will rely on the next generation of microbiologists to meet this challenge by pioneering new approaches for treating or preventing antibiotic-resistant infections.

At the same time, there are great opportunities created by the recent birth of a new discipline, microbiome research, which focuses on microbial communities that form a first line of defense against harmful microbes entering our body. Immunologists and scientists interested in big data analysis are currently in no short supply in the microbiome space. However, maturing this microbiology discipline will require combining principles of host-microbe interaction with microbial ecology and microbial physiology (4). Early-career scientists in the microbial pathogenesis field are well positioned to fill this void, as their expertise covers both sides of host-microbe interaction, a prerequisite for embracing a multidisciplinary approach. In turn, such a multifaceted approach will usher in a "new microbiology" aimed at studying host-pathogen interaction in the age of microbiome research.

By meeting current challenges and opportunities created by antibiotic resistance and microbiome science, infectious disease research will become a lynchpin for advances in human medicine for decades to come. Key to success in this area is the infusion of fresh ideas by early-career scientists, who with their energy, optimism, creativity, and willingness to challenge conventional wisdom often deliver some of the most impactful advances in the field. Assistant professors are often overlooked at meetings because established investigators provide visibility that guarantees good attendance. With this special issue, we wanted to generate a forum to highlight some of the brightest early-career scientists who embody the future of research on host-microbe interaction. This special issue provides a preview of new and innovative lines of research that will shape future research in our field. We are excited to showcase some of the best early-career scientists and plan similar special issues in the future to keep you up to date on who is who in infectious disease research. We hope that you will enjoy reading about refreshing new ideas and concepts that will shape the future of our field.

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