simply the production of a bacteriocin. A second pair of unrelated papers set out to understand how enteropathogens could overcome colonization resistance. In separate mouse studies and using different enteropathogens (*Citrobacter rodentium* or *Salmonella*), it was shown that intestinal inflammation altered the composition of the host's microbiota and made them susceptible to colonization by the invading bacteria. In both cases the bacteria needed to be able to elicit gut inflammation in order to establish themselves — in other words, this appeared to be a case of the enteropathogen co-opting the host's immune response to its advantage.

Colonization resistance has proved to be a useful model for understanding the dynamics of microbial communities in the gut and other barrier surfaces, such as the skin, however in one sense it is strikingly similar to the much earlier ecological concept of 'allelopathy'. Initially outlined in the 1930s to describe interactions between certain plant species, allelopathy was later broadened to describe the suppression of any competitor organism by another through the generation of biologically active factors.

As we teeter towards the dangers a post-antibiotic era, further insights from the study of colonization resistance could offer the hope of novel antimicrobial therapies.

Zoltan Fehervari, *Nature Immunology*

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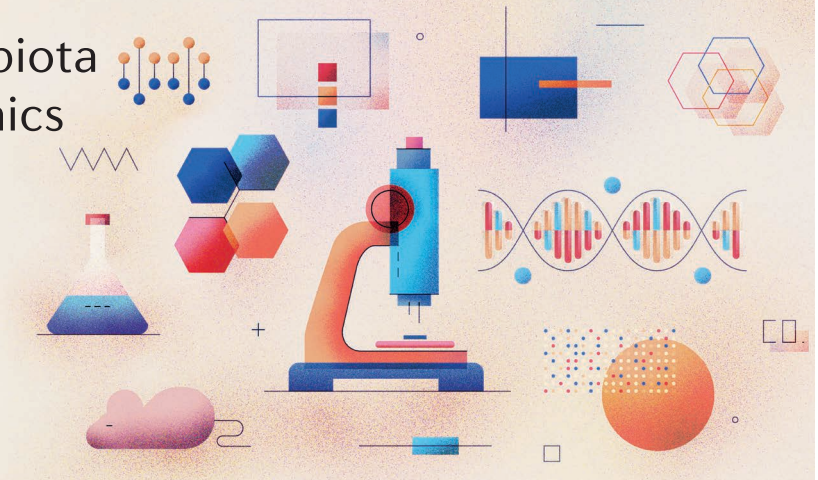
MILESTONE 14

Functional human microbiota analyses in vivo using 'omics technologies



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Eline Klaassens and colleagues applied a metaproteomics approach to uncultured faecal microbiota, providing the first insights beyond taxonomic identification. This was followed by numerous studies using 'omics methods, such as metabolomics and metatranscriptomics, as well as the development of multi-omics pipelines; methods that are still uncovering the functions of the microbiota today.

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