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► **COVER:** 'Armed to the teeth' by George Marshall, inspired by the Reviews on p471 and p481.



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**T**he microbiology of the oral cavity has been a topic of research for microbiologists ever since Antonie van Leeuwenhoek first spotted 'animalcules' in scrapings from his teeth in the 1670s. From these humble beginnings, oral microbiology has grown into a multidisciplinary science, and over the past 50 years the oral microbiota has become one of the best characterized human microbial ecosystems. A healthy mouth contains somewhere between 100 and 200 bacterial species, many of which are present in polymicrobial biofilms. On [page 471](#), Paul Kolenbrander and colleagues take a detailed look at oral biofilm formation, including the initial adherence of bacteria to teeth and oral tissues, and the roles of interspecies cooperation and signalling in both biofilm formation and pathogenesis. On [page 481](#), Richard Darveau examines the microbial aetiology of periodontitis, a chronic inflammation of the gums that affects millions of people each year.

This issue also includes the first in our new article series on Applied and Industrial Microbiology. The potential applications for microorganisms and their products are many and varied and include the generation of high-value products such as drugs, chemicals, fuels and even electricity. On [page 511](#), Jan van der Meer and Shimshon Belkin begin the series by reviewing the latest progress in the development of bacterial bioreporters. Although there have been many proof-of-concept studies illustrating the utility of bacterial bioreporter assays for detecting toxicants in air, water, soil and foodstuffs, there have been surprisingly few commercial applications. Van der Meer and Belkin take a critical look at the field and the potential for future commercial success.

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