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► **COVER:** 'The colourful world of microbiomes' by Philip Patenall, inspired by the Reviews in this special issue.

This month, *Nature Reviews Microbiology* presents a Focus on one of the most important emerging topics in microbiology: mucosal microbiology. The mucosal surfaces of humans, inside and outside, are covered with microorganisms. On page 244, Elizabeth Grice and Julia Segre describe the microorganisms that are found on the human skin. The environment on our skin is not uniform, varying in temperature, exposure to the air and levels of moisture, and this is reflected by the microorganisms that are found at different skin sites. Furthermore, skin disorders may have a microbial component, either through infection by a pathogen or by invasion of a species that is normally present as a commensal on the skin. On page 279, Ruth Ley and colleagues discuss the host and microbial factors that allow microorganisms to become established in the gut, and on page 233 Finlay and colleagues discuss the changes that occur as a result of antibiotic treatment. These changes have important implications for host immune homeostasis and can affect host susceptibility to other diseases.

Under normal circumstances, host factors maintain a balance between the host immune response and the microorganisms in the gut. Some of the factors that regulate the protective mucus layer which covers the intestinal tract from the stomach to the rectum are described by Michael McGuckin and colleagues on page 265. This mucus layer prevents commensal bacteria from reaching the epithelial cell layer, although pathogenic bacteria have developed strategies to navigate through this layer and cause disease. Finally, on page 254, Ellen Foxman and Akiko Iwasaki describe how complex diseases, such as type I diabetes, asthma and inflammatory bowel disease, require a combination of factors, including viruses and a genetic predisposition of the host.



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Getty Images unless otherwise credited.

Printed in Wales by Cambrian Printers
on acid-free paper