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► **COVER:** 'Magic mushrooms' by Philip Patenall, inspired by the Review on p177.


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In order to sense and respond to their environment, microorganisms use large structures on their surface. For example, on page 166 Olaf Schneewind and colleagues describe the role of pili, which allow bacteria to adhere to surfaces, and the role of sortases in building these structures in Gram-positive bacteria. The house-keeping sortase covalently links proteins, including pilus subunits, to the cell wall, whereas dedicated sortases promote the covalent linkages that hold the pilus subunits together. On page 153, Armitage and colleagues use *Rhodobacter sphaeroides* as a model system to describe how bacteria sense the signals in their environment, integrate this information with that related to the metabolic state of the cell, and relay this information to direct their motility.

Bacteria are not the only organisms to interact closely with their environment. As described on page 193 by Kronstad and colleagues, pathogenic fungi in the genus *Cryptococcus* are exquisitely adapted to their human host. Best known as opportunistic pathogens, some species, such as *Cryptococcus gattii* (which was responsible for a recent outbreak), can cause disease in healthy humans. Other microorganisms can not only sense their environment, but also clean it up. On page 177, as part of our ongoing series on Applied and Industrial Microbiology, Harms and colleagues describe the metabolic and ecological properties of fungi that make them especially useful for bioremediation.

Finally, accompanying this issue is a Poster describing the features of *Pseudomonas aeruginosa* that make it such a dangerous pathogen. These include its intrinsic and acquired resistance to many antimicrobials, its ability to form biofilms and its many pathogenicity factors. Thanks to the generous support of Cubist Pharmaceuticals, this poster can be downloaded for free at www.nature.com/nrmicro/posters/pseudomonas/index.

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