

## IN BRIEF

 BIOFILMS***Bacillus* biofilms grow with the flow**

Biofilm growth relies on the transport of solubilized nutrients and waste largely by diffusion, but the mechanism of transport over large distances, when diffusion is limited, has been unclear. A recent study reports the discovery of an integrated network of channels that transport liquid through wild-type *Bacillus subtilis* biofilms. Because the flow of liquid is strongly influenced by biofilm architecture, the impact of characteristic macroscopic wrinkles in mature *B. subtilis* biofilms was examined using microscopy. In contrast to flow in flat regions of the biofilm, liquid flowed rapidly into the spaces directly below the wrinkles and followed a network of interconnected channels with well-defined structures. Furthermore, spatial variation in the degree of evaporation from the surface of biofilms was found to be responsible for driving the flow of liquid in the networks. As the biofilm aged, the channels were maintained, although their structure changed, suggesting that they are physiologically relevant during the biofilm life cycle.

**ORIGINAL RESEARCH PAPER** Wilking, J. N. et al. Liquid transport facilitated by channels in *Bacillus subtilis* biofilms. *Proc. Natl Acad. Sci. USA* 27 Dec 2012 (doi:10.1073/pnas.1216376110)

 ANTIMICROBIALS**Statins wise up to cerebral infection**

A new study demonstrates that statins (cholesterol-lowering drugs) are effective in the treatment of the cognitive sequelae associated with severe systemic infections. Because statins have pleiotropic immunomodulatory effects, Reis et al. evaluated the therapeutic effect of lovastatin in mice with cerebral malaria. When administered with an anti-*Plasmodium* drug, lovastatin prevented disruption of the blood-brain barrier, reversed reductions in cerebral capillary density and reduced leukocyte accumulation in infected tissue. The production of pro-inflammatory cytokines and reactive oxygen species was also lower in mice treated with lovastatin, and cognitive dysfunction was absent in those that went on to clear the infection. Similar results were obtained in a model of bacterial sepsis, indicating that statins could be a powerful adjuvant therapy for the prevention of inflammation and long-term cognitive defects associated with infectious diseases.

**ORIGINAL RESEARCH PAPER** Reis, P. A. et al. Statins decrease neuroinflammation and prevent cognitive impairment after cerebral malaria. *PLoS Pathog.* **8**, e1003099 (2012)

 ENVIRONMENTAL MICROBIOLOGY**Soil bacteria that don't make the cut**

Forest-to-pasture conversion in the Amazon rainforest has resulted in a substantial reduction in the biodiversity of plants and animals, but little is known about how this process affects soil microbial biodiversity. Using bar-coded pyrosequencing of bacterial 16S rRNA genes, Rodrigues et al. determined the composition of bacterial communities in forest and pasture soil samples, covering a large geographical site. Interestingly, they found that although local diversity increased after conversion, the pasture communities showed reduced diversity across geographical space. This biotic homogenization was caused by an overall loss of endemic forest soil bacteria, particularly members of the phylum Acidobacteria. Considering the fact that soil bacteria are integral to ecosystem function, these findings emphasize the need to consider the impact of land use change on microbial biodiversity.

**ORIGINAL RESEARCH PAPER** Rodrigues, J. L. M. et al. Conversion of the Amazon rainforest to agriculture results in biotic homogenization of soil bacterial communities. *Proc. Natl Acad. Sci. USA* 27 Dec 2012 (doi:10.1073/pnas.1220608110)