IN BRIEF

BIOFILMS

Small-molecule inhibitors target *Escherichia coli* amyloid biogenesis and biofilm formation

Cegelski, L. *et al. Nature Chem. Biol.* 25 Oct 2009
(doi:10.1038/nchembio.242)

During persistent urinary tract infections (UTIs), uropathogenic *Escherichia coli* (UPEC) use type I pili and amyloid fibres known as curli to form biofilms. Ring-fused 2-pyridone compounds inhibit type I pilus biogenesis in *E. coli*. However, strategies that target multiple adhesive structures are likely to be more effective in preventing biofilm formation. Cegelski *et al.* modified the ring-fused 2-pyridone compound BibC10, generating three novel compounds. Unlike BibC10, these compounds exhibited anti-amyloid activity, interrupting curli biogenesis in UPEC. Interestingly, these 'curlicides' retained the ability to inhibit type I pili biogenesis and were able to block both curli-dependent and type I pili-dependent biofilm formation. The most potent of these compounds, FN075, attenuated virulence of a UPEC strain in a mouse model of a UTI.

PARASITOLOGY

Hydrodynamic gene delivery of baboon trypanosome lytic factor eliminates both animal and human-infective African trypanosomes

Thomson, R. *et al. Proc. Natl Acad. Sci. USA* 26 Oct 2009
(doi:10.1073/pnas.0905669106)

Composed of the haptoglobin-related protein (HPR) and apolipoprotein L-1 (ApoL-1), human trypanolytic factors (TLFs) provide innate resistance to species of African trypanosomes, such as *Trypanosoma brucei brucei*, that cause fatal disease in livestock. Thomson *et al.* now show that non-human primates such as baboons, which are resistant to both *T. b. brucei* and the human-infective *T. b. rhodesiense*, have orthologues of HPR and ApoL-1 that form a functional TLF complex. Using a hydrodynamic gene delivery approach to express the baboon TLF in a mouse model, the authors show that baboon TLF confers a trypanolytic activity to mice that is effective against both human- and animal-infective trypanosome species.

ENVIRONMENTAL MICROBIOLOGY

Contribution of microbial activity to carbon chemistry in clouds

Vaitilingom, M. *et al. Appl. Environ. Microbiol.* 23 Oct 2009
(doi:10.1128/AEM.01127-09)

The free radicals generated by photochemical processes were thought to be solely responsible for the turnover of organic carbon compounds in the atmosphere, until recent investigations suggested a role for microorganisms suspended in cloud water. Vaitilingom *et al.* investigated the biodegradation of atmospheric organic C1 to C4 compounds by bacteria and yeast that were isolated from cloud water. Microcosm experiments showed that microbial activity contributed to the degradation of formate, acetate and succinate. The lifetimes of organic compounds subjected to biodegradation were 5–50 times as long as those of compounds undergoing oxidation by hydroxyl radicals but one-tenth as long as those of compounds subjected to degradation by nitrate radicals. Hydroxyl radicals dominate atmospheric oxidation processes during daylight hours, whereas nitrate radicals play a part in the turnover of carbon compounds at night, suggesting that microbial turnover of atmospheric organic carbon compounds predominates during the night.