

DISEASE WATCH | IN THE NEWS

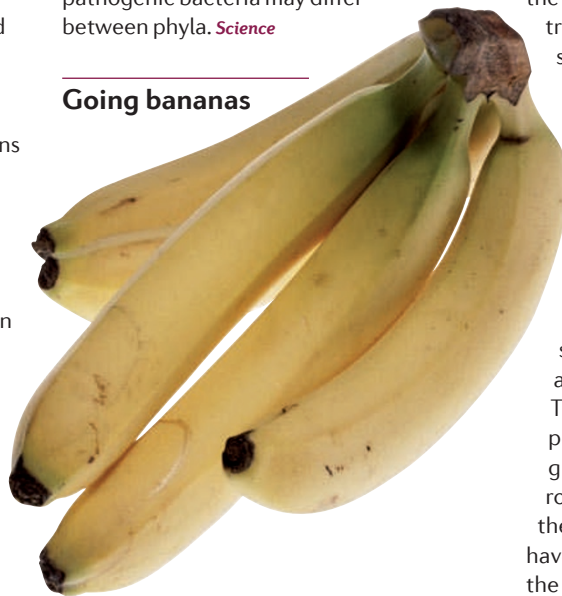
Transplant trouble

Haematopoietic stem cell transplantation (HSCT) in patients suffering from haematological malignancies is accompanied by a high incidence of fungal infections. However, individual risks of infection vary substantially between HSCT recipients. Plantinga *et al.* now identify a polymorphism in the *DECTIN 1* (also known as *CLEC7A*) gene that is associated with increased colonization of *Candida* species following HSCT. Dectin-1 is a C-type lectin expressed on the surface of myeloid cells that recognizes 1,3- β -glucans from *Candida* species and synergizes with Toll-like receptor (TLR) 2 and TLR4 signalling to promote T helper (T_H) 1 and T_H 17 cell immune responses. The Y238X polymorphism leads to the loss of the last 10 amino acids of the extracellular domain of dectin-1, causing a decrease in the capacity for binding of 1,3- β -glucans. In accordance with this finding, patients bearing the Y238X polymorphism were more likely to be colonized with *Candida* species. Screening HSCT recipients for this polymorphism could allow targeted antifungal prophylaxis to prevent systemic *Candida* infections following transplantation. *Clin. Infect. Dis.*

Inner resistance reservoirs

Antibiotic resistance determinants encoded on mobile elements can move between diverse bacteria in interacting communities. With widespread use of antibiotics, communities such as the human intestinal microbiota could provide a potential reservoir for resistance genes that can be acquired by clinically relevant pathogens. George Church and colleagues have used functional selection and metagenomic analysis to begin to analyze the resistance reservoir potential of the gut microbiota of two healthy individuals. Culture-independent sampling of saliva and faeces led to the identification of 95 inserts encoding resistance genes, which when expressed in *Escherichia coli* conferred resistance against 1 of 13 antibiotics. Most of these genes were from the dominant Bacteroidetes and Firmicutes phyla and were only distantly related to known resistance genes found in pathogenic isolates. By contrast, in isolates from faecal samples that were grown under aerobic conditions, the less

abundant Proteobacteria were found to be predominant. From this pool, 115 inserts encoding resistance genes were identified, and these genes were found to be highly related to resistance genes found in clinical pathogens. The human microbiome therefore harbours a sizable reservoir of antibiotic resistance genes; however, the potential for acquisition of these genes by pathogenic bacteria may differ between phyla. *Science*

Going bananas

Banana crops are under attack across Central Africa from two diseases that threaten to damage local agriculture and devastate entire ecosystems. The fourth-largest fruit crop in the world after grapes, citrus fruits and apples, bananas are a staple food product for large regions of Africa. The first disease, banana bunchy top virus (BBTV), is spread by aphids and can lead to stunted growth of the banana plant. Some varieties of banana are more readily susceptible to BBTV infection, but no individual variety is resistant and infection can be impossible to eradicate once it has become established. Crops are also under attack from bacterial wilt caused by the bacterium *Xanthomonas campestris* pv. *musacearum*, infection with which leads to premature ripening of the fruit. Bacterial wilt can wipe out up to 90% of a crop. In a statement from the Consultative Group on International Agricultural Research, a network of leading agricultural research centres, the recommendation for dealing with the two-pronged attack involves “excavating entire banana fields and treating them with pesticides, or burning the plants”.

BBC/NY Times

Plug sparks infection

While in the midgut of the sand fly vector, *Leishmania* parasites synthesize promastigote secretory gel (PSG), a proteophosphoglycan gel that forms a ‘plug’ that effectively blocks the sand fly gut. On biting a human, before the sand fly can take a blood meal it must regurgitate the plug, thereby providing a route for transmission of the parasites into the skin. However, the role of the PSG does not stop at transmission, according to a study published in *PLoS Pathogens*. The authors found that PSG exacerbates *Leishmania* infection by recruiting macrophages to the site of infection. The parasites are engulfed by these macrophages but survive instead of succumbing to nitric oxide-mediated killing, like many other pathogens. PSG stimulates arginase activity, leading to an increase in L-arginine catabolism. This provides a plentiful supply of polyamines, which are essential for growth of the parasite. Arginase has a key role in orchestrating wound healing, and the authors suggest that *Leishmania* may have adapted to exploit host responses to the skin damage caused by the bite of the sand fly vector. *BBC/PLoS Pathog.*

Outbreak news

Japanese encephalitis. In the state of Uttar Pradesh in northern India, 900 affected children have been admitted to hospital and over 200 children have died in an outbreak of Japanese encephalitis. Situated in the foothills of the Himalayas, low-lying areas of Uttar Pradesh are prone to annual flooding and this, coupled with poor sanitation, provides a breeding ground for the Asian rock pool mosquito, *Aedes japonicus*, which transmits the disease. In a related story, *Aedes japonicus* has also been reported to have colonized an area in Switzerland, providing the first evidence of breeding and spread in central Europe. This invasive mosquito is also capable of transmitting West Nile virus from birds to humans, although the disease has not yet been found in birds in central Europe. *BBC/Associated Press/Swiss Info*

In the News was compiled with the assistance of David Ojcius, University of California, Merced, USA. David's links to infectious disease news stories can be accessed on Connotea (<http://www.connotea.org>), under the username NatureRevMicrobiol.