**DISEASE WATCH | IN THE NEWS**

**New fungicide found**

Insects such as *Drosophila* spp. produce a range of antimicrobial peptides to protect against infection. One of the antimicrobial peptides that is produced by *Drosophila* spp. is drosomycin, which has been shown to be highly active against filamentous fungi and is released following the activation of Toll. Reporting in *Antimicrobial Agents and Chemotherapy*, Mihai Netea and colleagues now describe the discovery of a human homologue of drosomycin. A BLAST search was used to look for human homologues, and a 42-amino acid peptide was identified, which the authors have named drosomycin-like defensin (DLD). Synthetic DLD was found to have broad-spectrum activity against filamentous fungi, including *Aspergillus* spp., and further work demonstrated that it is produced in various human tissues, including the skin. This is the first example of an endogenous human peptide with specific antifungal activity. *Antimicrob. Agents Chemother.*

**Mumps immunity on the wane?**

The year 2006 saw the largest outbreak of mumps in the United States for 20 years. A new analysis of the outbreak that was published in a recent issue of the *New England Journal of Medicine* concludes that further outbreaks may only be avoided if a more effective vaccine is developed or an alternative vaccine strategy is implemented. Of the 6,584 cases that were reported to the Centers for Disease Control and Prevention by state health departments in 2006, 4,039 cases fitted the inclusion criteria for the analysis. Most cases (85%) occurred in 8 mid-western states and the incidence was highest in college-aged individuals. In the United States, the current mumps vaccine strategy involves two doses of the measles, mumps and rubella (MMR) vaccine. For those individuals for whom the vaccination status was known, 84% of those aged from 18 to 24 years had received the two doses. The authors state that there could be many reasons for the failure of the two-dose vaccine, including waning immunity or the fact that the mumps vaccine does not confer effective immunity against heterologous strains. *N. Engl. J. Med.*

**First World Malaria Day**

The first World Malaria Day was held on 25 April, and the event received a lot of press coverage worldwide. The theme for the day was ‘Malaria — a disease without borders’, and it was accompanied by a call for a global approach to malaria control. Various new initiatives were announced to coincide with the event. The United Nations marked the day with an announcement from the Secretary-General Ban Ki-moon of a new drive to ensure that all countries in Africa have access to interventions, such as indoor spraying with insecticides and insecticide-treated bed nets, as well as ensuring that all public health facilities have access to effective malaria treatment and diagnosis, by the end of 2010. In support of this initiative, the Roll Back Malaria Partnership launched a ‘Cover The Bed Net Gap’ initiative, which aims to rally support from donor countries, multilateral institutions, the private sector and the general public to achieve the goal of universal bed-net coverage by 31 December 2010. Executive Director of the Roll Back Malaria Partnership Awa Marie Coll-Seck commented “It is time to recognize that even the safest national borders cannot protect us from global threats such as malaria.” *UN/Roll Back Malaria Partnership*

**Still man’s best friend?**

Just before he stepped down from the post, Britain’s acting Chief Veterinary Officer Fred Landeg hit the headlines as he cautioned dog owners not to allow their dogs to sleep in their bed or even in their bedroom. Landeg commented that such practices are ill advised because not only can dogs carry bacteria, such as *Campylobacter* and *Salmonella* spp. and meticillin-resistant *Staphylococcus aureus*, but it could also be possible for domestic animals, such as dogs, to be the sources for more exotic, zoonotic infections. *Telegraph/Times*

**Death knell for ‘nanobacteria’?**

‘Nanobacteria’ have been purported to be living organisms that are 80–500 nm in size, and have been implicated in a range of human diseases, including kidney–stone formation. The nature of nanobacteria has been highly controversial, however. Two recent papers have now re-examined the nanobacteria theory, and both conclude that nanobacteria are in fact an abiotic phenomenon. Martel and Young report in *Proceedings of the National Academy of Sciences USA* that they could obtain nanobacteria-like particles from healthy human serum by following a previously published protocol, but observed that these particles were identical to the particles that are obtained when CaCO₃ precipitates. Further investigations proved that varying the levels of CO₂ and NaHCO₃ in the growth
medium that was used to incubate the human serum could change the appearance of the nanobacteria-like particles and so, as a result of these and other data, the authors concluded that the nanobacteria they observed are CaCO₃ precipitates. In a separate paper, Raoult et al. analysed the 'nanobacteria' strain Nanobacterium sp. strain Seralab 901045. This strain was submitted to a comprehensive battery of tests, and the authors concluded that there was no evidence to support the theory that nanobacteria are living organisms, and instead proposed that they are self-propagating particles that comprise a fetuin-containing mineral–protein complex. Proc. Natl Acad. Sci. USA/PloS Pathog.

**Clues to acute lung injury**

Respiratory pathogens, such as the severe acute respiratory syndrome coronavirus (SARS-CoV) and the H5N1 influenza virus, have high mortality rates owing to induction of the most severe form of acute lung injury (ALI), which is known as acute respiratory distress syndrome (ARDS) and is characterized by pulmonary oedema and the accumulation of inflammatory cells and cytokines. A similar syndrome can also be induced by the aspiration of gastric acid or inhalation of anthrax spores. Reporting in a recent issue of Cell, Yumiko Imai, Joseph Penninger and colleagues have now elucidated the molecular mechanisms that are responsible for ARDS. Initial analysis of inbred mice strains demonstrated that mice that were deficient for Toll-like receptor 4 (TLR4) were naturally resistant to acid-induced ALI, and further probing showed that the TLR4–TRIF–TRAF6 pathway is the key downstream signalling pathway involved. Further work identified oxidative stress and, more specifically, the formation of oxidized phospholipid as the TLR4 trigger for inflammation. J. Infect. Dis.

**Centre stage for SarZ**

Staphylococcus epidermidis is becoming an increasingly important cause of nosocomial infections, particularly those that are associated with indwelling devices, such as catheter-related infections and endocarditis associated with prosthetic heart valves. One of the main S. epidermidis virulence factors is biofilm formation. Much progress has been made recently in identifying the genes that are involved in S. epidermidis biofilm formation, but little was known about how these genes were regulated. Writing in the Journal of Infectious Diseases, Li Wang, Min Li et al. now identify SarZ as a key regulator of S. epidermidis biofilm formation and virulence. Previous in vitro screens for biofilm determinants generated a high number of false positives; Wang, Li and colleagues developed a more discriminatory screening system that involved two consecutive in vitro assays, and this new system only identified a single transcriptional regulator, SarZ, which is a paralogue of the S. aureus regulator SarA. SarZ upregulates many genes that have been implicated in biofilm formation and virulence, including the ica-encoded polysaccharide intracellular adhesin (PIA). J. Infect. Dis.

**Varying the vaccine**

Although smallpox was officially eradicated in the late 1970s, the threat of use of smallpox as an agent of bioterrorism and concerns over the safety of the existing vaccine mean that there is continuing interest in developing new smallpox vaccine strategies. The current vaccine (Dryvax) is based on a live-virus preparation of vaccinia virus. Xu et al. were interested in exploring an alternative strategy for vaccine development that was based on targeting virus-encoded immune-response modifiers (IRMs), and they used the mousepox virus, ectromelia virus, as a model. The IRMs that are encoded by orthopoxviruses, such as ectromelia and variola virus, are known to be type I or type II interferon-binding proteins (IFN BPs), but the role of these proteins in orthopox virulence was unclear. Xu et al. found that the type I IFN BP that is encoded by ectromelia virus is essential for virulence. Interestingly, from a vaccine standpoint, in mice this protein was also found to be a natural target of the anti-orthopoxvirus antibody response and could be used as an effective vaccine. This study therefore provides proof of principle for the concept of developing vaccines for viral diseases that target non-structural, secreted proteins. J. Exp. Med.

**Outbreak news**

*Hand, foot and mouth disease*. By the beginning of May, almost 16,000 cases of hand, foot and mouth disease, including >25 deaths, had been reported in children in China. Hand, foot and mouth disease can be caused by several viruses from the Picornaviridae family, and in this outbreak the causative agent has been identified as enterovirus 71. Associated Press

*Chikungunya virus*. Chikungunya virus had infected 473 people in the Sukoharjo District of Indonesia by the end of April, with 159 infections reported in April alone. The ongoing outbreak is expected to end with the rainy season in June. ProMed Mail

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’.