

INFECTIOUS DISEASE

Flu makes bacteria go bad

A normally harmless bacterial biofilm can take a dangerous turn when exposed to a virus.

Streptococcus pneumoniae can trigger bacterial pneumonia, but also colonizes the nose or throat passages of up to 15% of healthy adults. To learn how it might become pathogenic, researchers led by Anders Hakansson at the State University of New York in Buffalo grew films of *S. pneumoniae* on a layer of human epithelial cells of the type that normally lines airways.

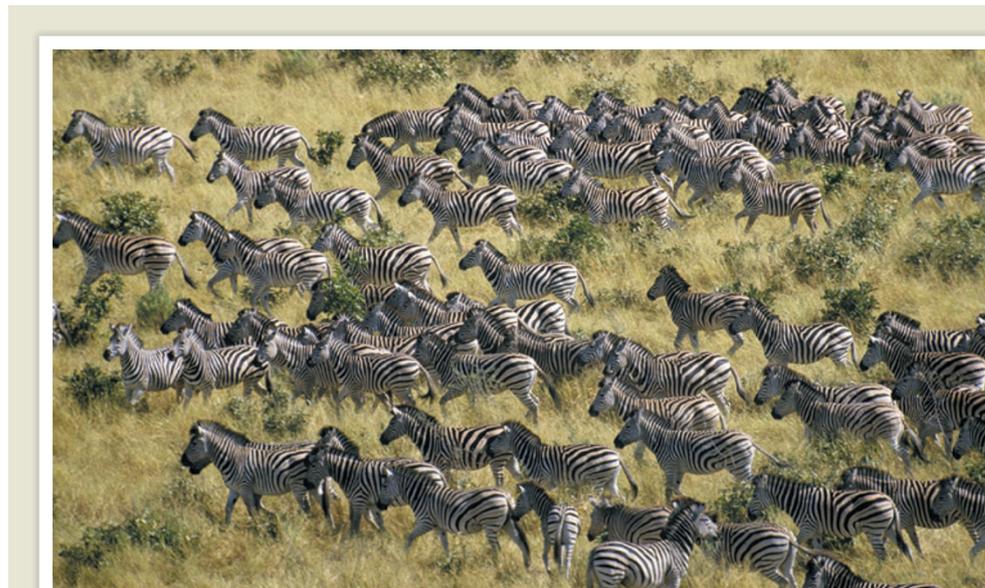
Infecting the epithelial cells with influenza virus caused bacteria to disperse from the biofilms, as did mimicking flu-induced conditions such as fever. Dispersed *S. pneumoniae* invaded normally uncolonized sites including the lung and middle ear in mouse studies, where they caused oedema and inflammation. They also had a more virulent gene-expression pattern than bacteria growing in biofilms or in standard laboratory conditions. 'Interkingdom signalling' could be key to inducing disease, the authors say. *mBio* 4, e00438-13 (2013)

ASTRONOMY

Heavy-metal stars make lead clouds

Two helium-rich stars contain more of the element lead than astronomers have ever seen. The stars may represent an intermediate stage of stellar evolution in which heavy metals can become enriched and form cloud-like layers.

A team led by Naslim Neelamkodan and Simon Jeffery of Armagh Observatory near Belfast,



FRANS LANTING/FLPA

ANIMAL BEHAVIOUR

Travelling zebras forecast the weather

Zebras in Botswana heed subtle weather and vegetation clues when choosing when and how to move to greener pastures.

Hattie Bartlam-Brooks of the University of Bristol, UK, and her colleagues fitted adult zebras (pictured) with tracking collars and monitored them daily on their annual migration from the Okavango Delta to the Makgadikgadi grasslands, around 250 kilometres away. They compared the migrations of seven mares with models informed by satellite data on regional

vegetation and rainfall. The animals seemed to use local cues to anticipate the food and water available at their destination and adjust their movements accordingly — for example, by delaying departure or reversing direction when rainfall was unseasonably late.

Zebras' forecasting skills might help them to adjust to environmental and climate change, the authors note.

J. Geophys. Res. Biogeo. <http://dx.doi.org/10.1002/jgrg.20096> (2013)

MOLECULAR BIOLOGY

Molecular switches in RNA

An RNA-protein complex regulates gene expression in an unanticipated way.

The cellular machines called spliceosomes reconfigure transcribed RNA into its mature, protein-coding form. The 'minor spliceosome' is less than 1% as abundant as the major spliceosome, but exists in plants, fungi and animals, with precursors to hundreds of human

messenger RNAs containing a section removed only by the minor spliceosome. Researchers led by Gideon Dreyfuss at the University of Pennsylvania School of Medicine in Philadelphia showed that a component of the minor spliceosome, an RNA-protein complex called U6atac, is extremely unstable and normally limits the machine's activity. When cells are stressed, however, signalling enzymes stabilize U6atac, boosting its levels and increasing the production of mature RNAs. This allows the minor

UK, analysed light from nine subdwarf stars and discovered the two lead-rich stars about 250 parsecs and 300 parsecs from Earth, respectively. The researchers think that the stars could each contain as much as 100 billion tonnes of lead — up to 100 times the amount found in normal subdwarf stars.

Starlight exerts radiative pressure, a slight force that can nudge particles. This may drive the heavy metal to separate into a thin atmospheric layer, the team suggests.

Mon. Not. R. Astron. Soc. <http://dx.doi.org/10.1093/mnras/stt1091> (2013)