

IN BRIEF

BACTERIAL PATHOGENESIS**A pneumococcal heart-breaker**

Invasive pneumococcal disease is often associated with an increased incidence of adverse cardiac events. A new study now shows that *Streptococcus pneumoniae*, the main cause of community-acquired pneumonia, causes direct cardiotoxicity and induces the formation of microscopic lesions within the myocardium of experimentally infected mice. These microlesions had a vacuolar morphology, were filled with pneumococci and lacked infiltrating immune cells. Microlesion formation required interactions between the bacterial choline binding protein A (CbpA) and host laminin receptor, and between the bacterial cell wall and platelet-activating factor receptor (PAFR). In addition, *S. pneumoniae* pneumolysin was detected in the lesions, and exposure to the purified toxin resulted in the death of cardiomyocytes. Finally, antibodies against CbpA and pneumolysin prevented microlesion formation, which suggests that a pneumococcal vaccine may have the potential to prevent cardiac damage.

ORIGINAL RESEARCH PAPER Brown, A. O. *et al.* *Streptococcus pneumoniae* translocates into the myocardium and forms unique microlesions that disrupt cardiac function. *PLoS Path.* e1004383 (2014)

BACTERIAL GENETICS**Chromosomal position regulates gene expression**

The effect of chromosomal location on the expression of bacterial genes is understudied; here, Bryant *et al.* re-address how chromosomal position affects gene expression in *Escherichia coli* K-12. By inserting a reporter cassette composed of GFP under the control of the *lac* promoter at 14 different positions in the genome, they show that gene expression varies by ~300-fold depending on the insertion site; the expression of some loci was silenced or was increased compared with insertion at the wild-type *lac* locus. The differences in gene expression levels were not solely due to gene copy number and instead were mediated at the transcriptional level. In addition, DNA gyrase activity was associated with loci in which *gfp* was highly expressed, whereas transcriptionally silenced regions were associated with the loss of *gfp* expression. Thus, transcription as well as local chromatin structure contribute to the chromosomal position effect on gene expression.

ORIGINAL RESEARCH PAPER Bryant, J. A. *et al.* Chromosome position effects on gene expression in *Escherichia coli* K-12. *Nucl. Acids Res.* <http://dx.doi.org/10.1093/nar/gku828> (2014)

VIRAL INFECTION**Host and viral components of the influenza virion**

Influenza viruses produce pleomorphic virions, which has made it difficult to study their composition. Hutchinson *et al.* used a mass spectrometry approach to determine and quantify the protein composition of influenza virions. They show that the core architecture of virions is conserved despite variation in proteins that are encoded by different hosts and influenza viruses. In addition, the authors found that the conserved core structure is elaborated with host-specific proteins from avian or mammalian hosts, which suggests that distinct virions are associated with each host and that virion composition may need to switch for the virus to cross species barriers. The protein composition of virions exhibited similarities to that of purified host exosomes, which suggests that the virus might hijack the host pathways used for vesicle formation to generate new virions.

ORIGINAL RESEARCH PAPER Hutchinson, E. C. *et al.* Conserved and host-specific features of influenza virion architecture. *Nature Commun.* <http://dx.doi.org/10.1038/ncomms5816> (2014)