IN BRIEF

VIROLOGY

Tetherin lets HCMV in

Tetherin (also known as BST2) is known to inhibit the release of numerous enveloped viruses. Surprisingly, this study shows that, in the case of human cytomegalovirus (HCMV), tetherin has a beneficial role for the virus, enhancing its entry into the host cell. Cells induced to stably express tetherin showed higher HCMV infection levels than controls *in vitro*, an effect that was due to enhanced viral entry. Furthermore, activated monocytes, which naturally express tetherin and are important for HCMV latency and dissemination, showed increased surface expression of tetherin following HCMV infection, and tetherin knockdown decreased HCMV infection levels in these cells. As tetherin was also present on the virus particles, the authors speculate that the interaction between host and viral proteins results in enhanced binding of the HCMV virion to the cell membrane, in this case capturing it and facilitating its entry rather than preventing its release.

ORIGINAL RESEARCH PAPER Viswanathan, K. *et al.* BST2/tetherin enhances entry of human cytomegalovirus. *PLoS Pathog.* **7**, e1002332 (2011)

MICROBIOME

The benefits of being sociable

Social species of honey bees and bumble bees carry in their gut a species-poor bacterial community that is absent from solitary bee species. To examine the role of this gut microbiota, the authors raised worker bumble bees in a semisterile environment when they emerged from the pupae, and fed them either faeces from their nest mates or sterile sugar water (controls). Following inoculation with the parasite *Crithidia bombi*, controls (which lacked a normal gut microbiota) showed significantly higher levels of infection and parasite numbers than the faeces-fed workers. Similarly, wild-caught bees were less likely to be infected with this parasite if they carried a normal gut microbiota. Solitary bees are known to lack this gut microbiota, so the authors propose that the social environment facilitates the transmission of commensals between nest mates during gut formation, which may then protect the bees from parasites through competition for resources or secretion of antimicrobials.

ORIGINAL RESEARCH PAPER Koch, H. & Schmid-Hempel, P. Socially transmitted gut microbiota protect bumble bees against an intestinal parasite. *Proc. Natl Acad. Sci. USA* 14 Nov 2011 (doi:10.1073/pnas.1110474108)

ANTIMICROBIALS

Why zinc is bad for bacteria

Zn is known to have antibacterial properties, although the mechanism by which it acts was unknown. Here, the authors have found that Zn^{II} competes with Mn^{II} for binding to the *Streptococcus pneumoniae* protein PsaA, a solute-binding protein that transports Mn^{II} into the cell to manage oxidative stress, among other functions. Although Zn^{II} showed lower affinity for PsaA than Mn^{II}, the complex formed by Zn^{II} and PsaA was more thermally stable. Furthermore, increasing the Zn^{II}/Mn^{II} ratio, which would decrease Mn^{II} uptake, led to inhibition of *S. pneumoniae* growth *in vitro* owing to increased susceptibility to oxidative stress, as well as increased susceptibility to killing by polymorphonuclear leukocytes. Consistent with this, mice infected with *S. pneumoniae* showed a significant increase in Zn^{II} levels compared with controls in tissue samples collected 48 hours post-infection. So, it seems that Zn^{II} is toxic to *S. pneumoniae* because it inhibits Mn^{II} uptake.

ORIGINAL RESEARCH PAPER McDevitt, C. A. *et al.* A molecular mechanism for bacterial susceptibility to zinc. *PLoS Pathog.* **7**, e1002357 (2011)