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IN BRIEF

BACTERIAL PHYSIOLOGY

Hsp90 is the hot guy for *Shewanella oneidensis*

Chaperones are essential for the maintenance of cellular protein homeostasis, and although heat shock protein 90 (Hsp90) is one of the best-characterized chaperones in eukaryotes, its role in bacteria has remained elusive. Honoré *et al.* report that a *Shewanella oneidensis* strain that lacks *hsp90* exhibits a growth defect at high temperatures compared with the wild-type strain. By screening a plasmid library, they identified its first client as TilS, a protein that is involved in tRNA maturation. Moreover, *in vivo* bacterial two-hybrid assay and pull-down experiments revealed that the two proteins directly interact. The aggregation of TilS at high temperatures was markedly decreased in presence of Hsp90, further corroborating the crucial role of the chaperone in folding. As Hsp90 is highly conserved in bacteria, the authors speculate that it might have a similar role in other bacteria. Further work is required to address this question and identify other possible clients.

ORIGINAL ARTICLE Honoré, F. A. *et al.* Hsp90 is essential under heat stress in the bacterium *Shewanella oneidensis*. *Cell Rep.* **19**, 680–687 (2017)

MICROBIOTA

Clostridia protect from gut infections in early life

Neonates are highly susceptible to intestinal infections; this has been generally ascribed to the immaturity of the immune system, but other factors might contribute. Kim, Sakamoto *et al.* show that the composition of the gut microbiota is a key factor, as the microbiota protects the host against colonization by pathogens. The neonatal gut microbiota is less diverse and lacks two taxa that are dominant in older intestines: members of the orders Clostridiales and Bacteroidales. Administration of members of the Clostridiales, but not Bacteroidales, protected germ-free adult mice that were colonized with neonatal microbiota from infections, whereas in absence of members of the Clostridiales, both adults and neonates became susceptible. Importantly, host immunity did not contribute to the clostridia-mediated effect. The authors hypothesize that oxygen consumption by aerobic or facultative anaerobic bacteria in the gut could promote colonization by strict anaerobes, such as Clostridiales, which, in turn, could grant protection from enteric pathogens during the first days of life.

ORIGINAL ARTICLE Kim, Y. G., Sakamoto, K. *et al.* Neonatal acquisition of *Clostridia* species protects against colonization by bacterial pathogens. *Science* **356**, 315–319 (2017)

BIOFILMS

New ways for streptococci to settle down

The respiratory tract of patients with cystic fibrosis is a polymicrobial environment in which *Pseudomonas aeruginosa* is a dominant pathogen and oral commensal streptococci are emerging as cohabitants. Using a dual species biofilm model, Scoffield *et al.* showed that *Streptococcus parasanguinis* uses the *P. aeruginosa*-derived exopolysaccharide alginate to promote biofilm formation and colonization of the lungs, thereby interfering with *P. aeruginosa* pathogenesis. Although the streptococcal adhesin BapA1 is necessary for alginate-dependent biofilm formation *in vitro*, it is dispensable *in vivo*, in which fimbria-associated adhesion protein (Fap1) can also contribute to colonization. This study describes a new association between alginate and streptococcal adhesins, and reveals a new colonization mechanism for oral commensal streptococci in the cystic fibrosis lung environment.

ORIGINAL ARTICLE Scoffield, J. A. *et al.* A commensal streptococcus hijacks a *Pseudomonas aeruginosa* exopolysaccharide to promote biofilm formation. *PLoS Pathog.* **13**, e1006300 (2017)