IN BRIEF

MARINE MICROBIOLOGY

Proteorhodopsin phototrophy promotes survival of marine bactera during starvation

Gómez-Consarnau, L. *et al. PLoS Biol.* **8**, e100358 (2010)

Proteorhodopsins are light-driven transmembrane proton pumps that were initially identified in marine bacteria by metagenomic analysis and have subsequently been shown to be highly abundant and extremely genetically diverse. Owing to this diversity, a range of physiological functions have been proposed for these proteins in addition to light harvesting. Gómez-Consarnau *et al*. looked at the growth characteristics of the proteorhodopsin-containing marine species *Vibrio* sp. AND4 in a range of different conditions and concluded that the survival of this strain in nutrient-poor conditions was increased in the presence of light. Importantly, light had no effect on the growth of a proteorhodopsin-deficient mutant of *Vibrio* sp. AND4 under nutrient-poor conditions, indicating that proteorhodopsin-mediated phototrophy confers a fitness advantage on marine bacteria during periods of starvation.

BACTERIAL PHYSIOLOGY

An epigenetic switch governing daughter cell separation in *Bacillus subtilis*

Chai, Y. *et al. Genes Dev.* **24**, 754–765 (2010)

In *Bacillus subtilis*, the final stages of cell division require autolysin-mediated cleavage of the peptidoglycan cross wall that separates the two daughter cells. Reporting in *Genes and Development*, Richard Losick, Roberto Kolter and colleagues now reveal the details of the epigenetic switch that controls this process. During *B. subtilis* biofilm development, long chains of cells are formed. The regulatory circuit that controls biofilm development in *B. subtilis* involves the transcriptional regulators SlrR and SinR. The authors found that chain formation requires both SlrR and SinR and that these proteins form a heterodimeric complex that represses the expression of autolysin-encoding genes and other target genes, including genes involved in motility. Further investigations revealed that SinR, SlrR and *slrR* are involved in a self-reinforcing double-negative feedback loop. As *slrR* shows a bistable expression pattern, the authors conclude that this bistable switch allows the expression of autolysin and motility genes to be on when SlrR levels are high and off when SlrR levels are low.

INNATE IMMUNITY

miR-132 regulates antiviral innate immunity through suppression of the p300 transcriptional coactivator

Lagos, D. *et al. Nature Cell Biol.* **12**, 513–519 (2010)

Cellular microRNAs (miRNAs) are important regulators of gene expression that have been proposed to have a role in controlling the innate immune response to bacterial infection, but whether they also have a role in the innate response to viral infection was unknown. Dimitrios Lagos and colleagues looked at the effects of Kaposi's sarcoma-associated herpesvirus (KSHV) infection on miRNA expression in primary lymphatic endothelial cells. A functional screen of the induced miRNAs for a role in the antiviral response revealed that miR-132 was the most strongly induced early-response miRNA with the most significant effect on KSHV gene expression. Investigation of the functional role of miR-132 showed that it inhibits the antiviral interferon response by suppressing the activity of the transcriptional co-activator p300.