

## IN BRIEF

 MICROBIAL ECOLOGY**Wired communities**

Microbial consortia of sulfate-reducing bacteria metabolically coupled to methane-oxidizing archaea have important roles in nature. McGlynn *et al.* assessed the influence of interspecies spatial arrangements on biosynthetic activity in such consortia from deep-sea sediment incubations, using FISH, NanoSIMS and isotope probing. Interestingly, the biosynthetic activity of entire consortia was unrelated to the degree of mixing between archaeal and bacterial cells, and single-cell activity was independent of proximity to a syntrophic partner. The authors proposed a model for coupling in which electrons are transferred between species and flow freely across assemblies. Consistent with this, the genomes of archaeal consortium members encoded large multi-haem cytochromes, which are capable of electron transfer, and redox-based staining suggested the presence of redox-active haem proteins in the matrix between cells. The authors suggest that interspecies electronic coupling may facilitate the generation of stable syntrophic assemblages.

**ORIGINAL RESEARCH PAPER** McGlynn, S. E. *et al.* Single cell activity reveals direct electron transfer in methanotrophic consortia. *Nature* <http://dx.doi.org/10.1038/nature15512> (2015)

 VIRAL INFECTION**An endogenous retrovirus contributes to ALS**

A new study by Li *et al.* implicates the normally latent human endogenous retrovirus HERV-K in the pathogenesis of amyotrophic lateral sclerosis (ALS). Using RT-PCR and immunostaining, the authors detected the expression of HERV-K in post-mortem brain tissue samples from patients with sporadic ALS. Transfection of the HERV-K *env* gene into human neuronal cultures or activation of endogenous HERV-K using CRISPR–Cas9 decreased cell numbers, suggesting that the HERV-K Env protein may contribute to neuronal death. Transgenic mice expressing *env* exhibited progressive motor dysfunction, loss of motor neurons and other pathological changes characteristic of ALS. Further experiments demonstrated that the host DNA-binding protein TDP-43, which is overexpressed in ALS, binds to the HERV-K long terminal repeat and induces expression of the virus. The authors suggest that blocking the activation and replication of HERV-K may alter the course of disease in patients with ALS.

**ORIGINAL RESEARCH PAPER** Li, W. *et al.* Human endogenous retrovirus-K contributes to motor neuron disease. *Sci. Transl. Med.* **7**, 307Ra153 (2015)

 ANTIMICROBIALS**Triple therapy for MRSA**

Methicillin-resistant *Staphylococcus aureus* (MRSA) is becoming increasingly resistant to the most recently developed antibiotics. Now, Gonzales *et al.* identify a new potential therapy against multidrug-resistant MRSA comprising a combination of the clinically approved  $\beta$ -lactams meropenem, piperacillin and tazobactam (ME/PI/TZ). This triple combination acts synergistically to exhibit bacteriocidal activity against diverse MRSA strains *in vitro* and, owing to reciprocal collateral sensitivities of its components, suppresses the evolution of resistance. Notably, the triple therapy cleared a highly lethal MRSA infection in a mouse model as effectively as the more expensive monotherapy linezolid.

**ORIGINAL RESEARCH PAPER** Gonzales, P. R. *et al.* Synergistic, collaterally sensitive  $\beta$ -lactam combinations suppress resistance in MRSA. *Nat. Chem. Biol.* <http://dx.doi.org/10.1038/nchembio.1911> (2015)