Adaptive Laboratory Evolution Restores Solvent Tolerance in Plasmid-Cured *Pseudomonas putida*

Solvent-tolerant bacteria constitute promising platforms for biobased production of aromatic compounds and biopolymer building blocks. In *Pseudomonas putida*, solvent tolerance is associated with megaplasmids carrying solvent pumps and aromatic degradation pathways. Kusumawardhani et al. (e00041-21) succeeded in restoring solvent tolerance in *P. putida* S12 lacking its megaplasmid, by using adaptive laboratory evolution (ALE). Availability of a promiscuous resistance-nodulation-division (RND) extrusion pump, combined with metabolic flexibility, proved essential. This work underscores the importance of ALE as a tool to identify targets for strain optimization in general and to enhance solvent tolerance in *P. putida* and in other non-solvent-tolerant bacteria.

Novel Seafloor Experiments Reveal Stress of Shipboard Manipulations for Deep-Sea Microbes

Deep-sea hydrothermal vents are hot spots of microbial primary productivity, yet measurements of these communities and their activities are limited. Fortunato and colleagues (e00078-21) used a newly developed incubator instrument to carry out *in situ* experimentation on the seafloor to examine the effects of sample processing on autotrophic microbial communities. By comparing seafloor and shipboard incubations, Fortunato et al. showed that microbial communities were more stressed shipboard, and differences in metabolism were likely linked to the availability of oxygen. Such experimentation in the natural habitat provides new insights into microbial activities in the deep ocean.

*Lactiplantibacillus plantarum* Lp900 Persistence in Rats Increased by Dietary Inulin, Depending on the Dietary-Calcium Level

Growth on the prebiotic inulin is a relatively uncommon phenotype in *Lactiplantibacillus plantarum* and is facilitated by a plasmid-encoded extracellular beta-fructosidase in *L. plantarum* strain Lp900. Fuhren et al. (e00122-21) show that dietary inulin supplementation increased the intestinal persistence of *L. plantarum* Lp900 in rats with a high-dietary-calcium background but not those with a low-dietary-calcium background. Furthermore, symbiotic administration of Lp900 (i.e., in an inulin suspension) stimulated intestinal abundance of *L. plantarum* Lp900, particularly in a low-dietary-calcium background. This work emphasizes the modulating role of calcium on the interplay between pre- and probiotic dietary supplements.

Volatile Organic Compounds Mediate Community Assembly in Liquor Fermentation

Volatile organic compounds contribute to the quality and commercial value of many fermented foods. However, the role of volatile organic compounds in mediating community-level dynamics is still unclear. Zhang et al. (e02992-20) found that *Pichia*, one of the consortium microorganisms in Chinese liquor fermentation, produces organic volatiles that inhibit the growth of undesired fungi and consequently may affect the dynamic balance of the whole microbiota and metabolism. This study presents a new perspective to the modulation of microbial interactions in complex multispecies fermentation and also suggests new possibilities for tackling food spoilage.
Deep-Sea Hydrothermal DPANN Archaea Might Possess Unique Metabolisms and Important Ecological Functions

DPANN archaea are widely distributed in deep-sea hydrothermal vent environments. Cai et al. (e03009-20) assembled 20 high-quality DPANN genomes from deep-sea hydrothermal sediments and found a new candidate phylum designated *Kexuearchaeota*. Further metagenomic analyses revealed that DPANN members have incomplete biological processes like gluconeogenesis due to reduced genome size. However, they possess alternate strategies to address these deficiencies. They also have the potential to assimilate nitrogen and sulfur compounds, indicating potentially important ecological roles in deep-sea hydrothermal systems. This study contributes to a deeper understanding of special lifestyles of DPANN in this unique environment and provides clues to cultivate them in the future.