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Articles of Significant Interest Selected from This Issue by the Editors

"Infection" of Iron by Sulfate-Reducing Bacteria

Microbially influenced corrosion (MIC) is a costly problem in a number of industries. For example, in oil and gas production, microorganisms such as sulfate-reducing bacteria (SRB) contribute to the premature deterioration of pipelines. Despite its long history as an active field of research, MIC is still insufficiently understood with respect to the involved mechanisms and microorganisms. Enning and Garrelfs (p. 1226–1236) summarize what are presently considered the most likely explanations for MIC in anoxic, sulfate-rich environments and highlight the novel concept of electrical microbially influenced corrosion (EMIC): certain, recently discovered SRB "infect" iron and corrode it directly through uptake and consumption of metal-derived electrons.

Ashbya gossypii as a Novel Tool for Single-Cell Oil Production

Single-cell oil is gaining importance as a sustainable alternative to the use of either fossil or edible oils. Accordingly, the identification of efficient oleaginous microorganisms constitutes a major challenge for the field of oil biotechnology. Ledesma-Amaro et al. (p. 1237–1244) have shown that the filamentous fungus *Ashbya gossypii*, which is a paradigm of industrial ("white") biotechnology for the production of vitamin B_2, can be genetically engineered to accumulate huge amounts of fatty acids. Hence, this work introduces *A. gossypii* as a novel and robust tool for the production of added-value oils.

A Conserved Megaplasmid Plays a Central Role in *Burkholderia cenocepacia* Stress Tolerance

Members of the *Burkholderia cepacia* complex have multipartite genomes and harbor a nonessential megaplasmid (pC3, previously known as chromosome 3) that confers virulence and antifungal activity. While pC3 has been cured from many strains, this had not proven possible for the epidemic strain K56-2. Angoli et al. (p. 1340–1348) show that pC3 of strain K56-2 carries efficient toxin-antitoxin (TA) systems that are responsible for the unexpected stability of this replicon, shedding new light on the role of TA systems in genome evolution. This study also demonstrates that plasmid pC3 increases resistance to various stresses, explaining why this replicon is highly conserved within the *Burkholderia cepacia* complex.

Interaction between a Conjugative Plasmid and Its Host Genome

The *Bacillus subtilis* conjugative plasmid pLS20 alters transcription levels of almost 6% of the genes on the host chromosome during times of active conjugation, as shown in studies by Rösch and colleagues (p. 1349–1358). In response, many physiological changes occur in the host cells, mostly involving expression of metabolic enzymes and in membrane and cell wall-associated enzymes. Most notably, host cells become more resistant to a variety of stress conditions, revealing a broadly beneficial interaction between the plasmid and its host.

Shewanella oneidensis Biofilms with Increased Cohesiveness and Better Performance

Although biofilm-based bioprocesses have been increasingly used in various applications, long-term robust and efficient biofilm performance remains one of the main bottlenecks. Ding et al. (p. 1498–1506) showed that the cohesiveness and performance of *Shewanella oneidensis* biofilms in Cr(VI) immobilization could be enhanced by disrupting putrescine biosynthesis. The results also imply a potential role of putrescine in *S. oneidensis* through mediating biofilm matrix disassembly by influencing the structural configuration of the extracellular polymeric substances. This work demonstrates a novel strategy in biofilm engineering to improve performance in biofilm-based bioprocesses.

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