



Articles of Significant Interest Selected from This Issue by the Editors

Analysis of the Emergency Medical Service Microbiome Identifies the Need for Comprehensive and Robust Monitoring

Health care-associated infections affect millions of patients worldwide each year, with antibiotic-resistant pathogens posing additional risks. Consequently, monitoring of pathogens in hospitals is now routine, although little attention has been given to the emergency medical service (EMS) sector. Hudson et al. (e02098-17) provide a comprehensive review of literature investigating the presence of pathogens in the EMS microbiome. The few studies to date implicate ambulances as important pathogen reservoirs and potential vehicles for transmission. Large-scale studies that take advantage of novel DNA sequencing technologies are needed to further elucidate the epidemiological role of the EMS in pathogen transmission and to identify best cleaning practices.

Formation of Bacterial Aggregates in Liquid Cultures May Impact the Outcome of Experiments

Liquid pure cultures are fundamental for microbiological research. These cultures are normally thought of as comprising homogeneous single bacteria. Here Kragh et al. (e02264-17) show that this is not always true; bacteria may aggregate in liquid cultures. Aggregation can be induced by the method chosen for inoculation. These aggregates can significantly change the outcome of experiments by altering the phenotype of the cultures. The authors found a mechanism whereby preformed aggregates are able to recruit surrounding single cells, creating more and bigger aggregates. When first formed, these aggregates are difficult to remove. Aggregates in cultures may be an immense unseen challenge for microbiologists.

Condensed Tannins Reduce Mycotoxin Production and the Associated Microbiome in Silage

Condensed tannins are naturally occurring plant secondary compounds that possess a variety of biological activities, including protein-precipitating and antimicrobial activities, and have potential as alternatives to in-feed antibiotics. Studies conducted by Peng et al. (e02274-17) have shed light on the effects of condensed tannins on the complex microbial communities involved in ensiling and aerobic exposure of silage. Their research demonstrated that condensed tannins decreased bacterial diversity during both ensiling and aerobic exposure, increased fungal diversity during aerobic exposure, and reduced microbial populations associated with proteolysis and mycotoxin production, thereby improving silage quality and aerobic stability.

Autoinducer 2 Promotes the Formation of Mixed Biofilms

The quorum-sensing molecule autoinducer 2 (AI-2) is known to regulate the collective behaviors of diverse bacterial species inhabiting the human intestine, including *Escherichia coli* aggregation. However, comprising a minority population in the gut, *E. coli* is unlikely to reach cell densities high enough to activate its own collective response. Laganenka and Sourjik (e02638-17) resolve this paradox by showing that secretion of AI-2 by another gut inhabitant, *Enterococcus faecalis*, leads to chemotaxis-driven coaggregation of these two species and enhancement of *E. coli* biofilm formation and stress resistance. This mode of interspecies communication may be common in mixed microbial communities.

Mixed Biofilms of Bacteria and Extremotolerant Fungi Help in the Establishment of Opportunistic Pathogens in Dishwashers

The demand for household appliances such as dishwashers is increasing. While the harsh conditions in dishwashers should prevent the growth of most microorganisms, research by Raghupathi et al. (e02755-17) showed that certain microorganisms in mixed biofilms are well established, especially on rubber seals. *Candida*, *Cryptococcus*, and *Rhodotorula*—known to include opportunistic pathogenic species—were the most common fungal genera, while black yeast opportunistic pathogens of the genera *Exophiala* and *Aureobasidium* were also detected. *Escherichia*, *Shigella*, and *Pseudomonas* spp., common opportunistic pathogens, were integral bacterial constituents of biofilms in dishwashers. Understanding the formation and stability of such mixed biofilms will help to remove a potential threat to human health in domestic environments.