



Articles of Significant Interest in This Issue

***Escherichia coli* O157:H7 Growth Characteristics in Plants**

Fresh produce is an important vehicle for transmission of *Escherichia coli* O157:H7, but less is known about factors that could impact bacterial colonization potential and persistence, such as bacterial growth rates, biofilm formation, and plant metabolites. Here Merget and colleagues (e00123-19) show a positive relationship between bacterial growth rates in plant extracts and living plants for sprouted seeds, including alfalfa and fenugreek, but not for leafy vegetables, such as lettuce and spinach. Therefore, variability at the level of the bacterial isolate, plant species, and tissue type all need to be considered in produce risk assessment.

Rapid and Repeatable Assembly of Headwater Stream Bacterial Communities

Stream headwaters supply bacterial diversity for all downstream sites; however, the spatiotemporal dynamics of headwater microbial communities is underexplored. In two time series studies of microbial community composition in a headwater stream, Teachey et al. (e00188-19) showed that microbial diversity rapidly decreased along the length of the stream, accompanied by consistent enrichment of select freshwater-associated microbial taxa that continued to dominate downstream environments. These trends were repeatable at time scales of days to a year. This work suggests that headwater streams act as dynamic, selective filters that supply a stable set of microbial taxa to the greater watershed.

***Staphylococcus aureus* Phage Host Range**

Staphylococcus aureus is an abundant opportunistic pathogen that is increasingly multidrug resistant. This rise of antibiotic resistance in the pathogen makes alternative therapies, such as phage therapy, necessary. Phage therapy remains challenging in part due to a dearth of knowledge about the determinants of host range—the subset of bacterial strains within a species that a particular phage can infect. In their minireview, Moller et al. (e00209-19) survey known bacterial and phage mechanisms affecting host range in the *Staphylococcus* genus. The review proposes a model in which a hierarchical combination of host factors acting at different phylogenetic levels determines host range.

Novel Baeyer-Villiger Monooxygenase for the Production of Bio-Based Chemicals

Baeyer-Villiger oxidation of ketones catalyzed by Baeyer-Villiger monooxygenases (BVMO) presents a direct and green process for ester synthesis. However, poor stability and regioselectivity limit their wide use in industrial applications. Liu et al. (e00239-19) identified an excellent BVMO from *Rhodococcus pyridinivorans* that can be used for the efficient production of methyl 3-acetoxypropionate, a valuable platform compound, from bio-based methyl levulinate with extremely high space-time yield and perfect regioselectivity. This study demonstrates that BVMO-catalyzed oxidation holds great promise for the production of bio-based chemicals by simple and green routes.

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<https://doi.org/10.1128/AEM.00810-19>

Published 16 May 2019

New Insights into LanI-Mediated Immunity against Lantibiotics

Linear lantibiotics have a dual mechanism of action. First, they inhibit cell wall biosynthesis after binding lipid II; second, they form short-living pores, thereby disintegrating the cellular membrane. ABC transporters and LanI immunity proteins are expressed to protect producing cells. Hitherto, ABC transporters were considered as most significant for providing immunity. Using 3,3-dipropylthiadicarbocyanine iodide [DiSC₃(5)] diffusion assays, Geiger et al. (e00534-19) showed that Spal provides a fast response to protect the cellular membrane and, furthermore, that Spal recognizes the C-terminal part of the peptide. Knowing the molecular function of immunity proteins is important to improvement of production rates and to engineering of new peptide antibiotics.