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Articles of Significant Interest in This Issue

Protection against *Streptococcus pneumoniae* Conferred by the Commensal *Streptococcus mitis*

Despite the availability of pneumococcal vaccines, *Streptococcus pneumoniae* inflicts a severe socioeconomic burden on people worldwide. This accentuates the need to develop novel prophylactic strategies. Here Shekhar et al. (e02235-18) took advantage of *Streptococcus mitis*, a commensal human colonizer that shares immunogenic characteristics with *S. pneumoniae*, to induce protection against pneumococcal infection. Intranasal immunization of mice with *S. mitis* or its genetically engineered mutant expressing the pneumococcal capsule conferred protection against *S. pneumoniae* lung infection, which may have important implications for developing commensal-based vaccines against various pathogens, including *S. pneumoniae*.

Gut Microbiome of Preweaned Calves

A lack of information on the gut microbiota of neonatal calves prevents the use of microbial intervention strategies to improve calf gut health. Malmuthuge et al. (e02534-18) demonstrated an individualized ileum microbiome for neonatal dairy calves and found that calves could be grouped based on their microbiome composition and function. Furthermore, transcriptome analysis showed that these grouped calves exhibit varied immune functions. These findings may provide a framework for further analysis of interactions between the gut microbiota and the immune system and health of neonatal calves.

Poly-3-Hydroxybutyrate Metabolism Is Key for Plant Growth Promotion by the Endophytic Bacterium *Herbaspirillum seropedicae*

Plant growth-promoting bacteria (PGPB) are emerging as an alternative for sustainable fertilization. Several PGPB produce large amounts of the carbon storage polymer poly-3-hydroxybutyrate (PHB). However, the contribution of PHB to bacterial plant growth promotion is still uncertain. Alves et al. (e02586-18) analyzed the growth phenotypes of the grass *Setaria viridis* inoculated with *Herbaspirillum seropedicae* and several derivatives with mutations affecting PHB metabolism. This work demonstrated that deletion of genes involved in the synthesis and degradation of PHB reduced plant growth promotion but with little effect on overall root colonization, suggesting that PHB supports metabolic routes utilized by this bacterium to stimulate plant growth.

Quantitative PCR Assays of Highly Specific Sewage-Derived *Bacteroides* Target Sewage-Polluted Waters

Identifying sources of fecal pollution is critical for devising remediation strategies and protecting public health. Feng and McLellan (e02696-18) showed that the most abundant *Bacteroides* in sewage were not human associated but pipe derived. Two highly specific quantitative PCR assays were developed that provide measures for sewage pollution independent of human and animal gut microbiome variability. Established *Bacteroides* assays for source identification are limited to the V2 to V4 hypervariable regions of the 16S rRNA gene of certain intestinal species. This work characterized human-specific *Bacteroides* markers across multiple hypervariable regions so that markers could be compared with next-generation sequencing data sets.

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Development and Characterization of Aspirin-Inducible Biosensors in *Escherichia coli* and SimCells

A safe chassis and effective inducers are important in the application of synthetic biology to bacterial diagnosis and therapy, as well as environmental remediation. Chen et al. (e02959-18) developed a simple aspirin-inducible SalR/P_{sal} regulation system, designed different gene circuits, and characterized their performance in the probiotic strain *Escherichia coli* Nissle 1917 and minicell-derived SimCells (simple cells). The dose-response range of aspirin is 0.05 to 10 μM, which is safe for humans. The experimental results and mathematical simulations support the competitive binding hypothesis for SalR, a typical LysR-type transcriptional regulator (LTTR) family protein.