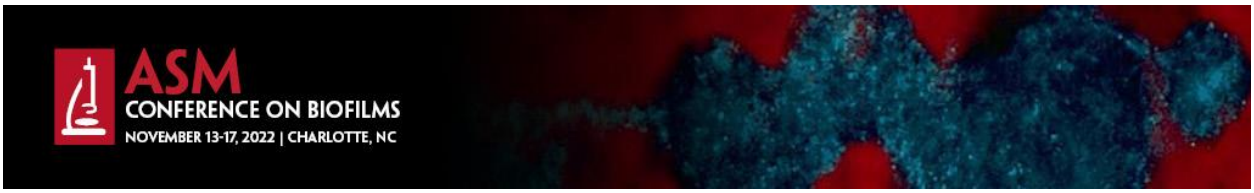

From Commensal to Pathogen: Dissecting the Biology of Invasive Enterococcal Aggregates

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Enterococcus faecalis is a commensal non-motile bacterium that resides in healthy individuals' gastrointestinal tracts, where its establishment seems mediated by forming biofilm-like aggregates. In susceptible hosts, this bacterium has the potential to breach intestinal barriers and cause life-threatening systemic infections. This process, called translocation, remains largely unexplored. Our team developed various model systems that identified key events enabling *E. faecalis* penetration of diverse surfaces. Specifically, we established that *E. faecalis* assembles multicellular aggregates covered by exopolymers to efficiently penetrate surfaces and translocate through human intestinal epithelial monolayers. While forming these aggregates promotes *E. faecalis* migration across surfaces, little is known about the metabolic and physiological states of the enterococci encased in these surface-penetrating structures. Recently, we found that enterococcal cells within the aggregates genetically reprogram their metabolism towards increased cell envelope and glycolipid biogenesis, which confers them with superior tolerance to membrane-damaging agents. In addition, our research determined that the surface-penetrating ability of *E. faecalis* is a metabolically coordinated process that dictates the spatial distribution of invading cells assembling multicellular communities. Hence, our findings revealed a previously underappreciated mechanism driving *E. faecalis* surface penetration, which might be targeted to better control systemic infections by this pathobiont.