

MAR11-2010-000183

Abstract for an Invited Paper
for the MAR11 Meeting of
the American Physical Society

Deadly competition between sibling bacterial colonies

AVRAHAM BE'ER, University of Texas at Austin, CNLD

As a result of stress due to nutrient limitation or antibiotics, competing individual bacteria within a single colony may lyse sibling cells to release nutrients (cannibalism) or DNA (fratricide). However, we have recently shown that competition is not limited to individuals, but can occur at the colony level [A. Be'er et al., PNAS 106, 428 (2009); A. Be'er et al., PNAS 107, 6258 (2010).] In response to the presence of an encroaching sibling colony, *Paenibacillus dendritiformis* bacteria secrete a lethal protein, lysing cells at the interface between the colonies. Analysis of the proteins secreted by these competing sibling colonies, combined with a mathematical model, shows how colonies maintain their growth by self-regulating the secretion of two proteins: subtilisin (a well-known growth promoter), and Slf (a previously unknown protein, which is lethal). The results also explain why a single colony is not inhibited by its own secretions.