

Abstract Submitted  
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**Growth of Bacterial Colonies** MYA WARREN, TERENCE HWA, University of California, San Diego — On hard agar gel, there is insufficient surface hydration for bacteria to swim or swarm. Instead, growth occurs in colonies of close-packed cells, which expand purely due to repulsive interactions: individual bacteria push each other out of the way through the force of their growth. In this way, bacterial colonies represent a new type of “active” granular matter. In this study, we investigate the physical, biochemical, and genetic elements that determine the static and dynamic aspects of this mode of bacterial growth for *E. coli*. We characterize the process of colony expansion empirically, and use discrete and continuum models to examine the extent to which our observations can be explained by the growth characteristics of non-communicating cells, coupled together by physical forces, nutrients, and waste products. Our results challenge the commonly accepted modes of bacterial colony growth and provide insight into sources of growth limitation in crowded bacterial communities.

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