

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Subinhibitory concentrations of cell wall synthesis inhibitors promote biofilm formation of *Enterococcus faecalis*¹ WEN YU, KELSEY HALLINEN, KEVIN WOOD, Univ of Michigan - Ann Arbor — *Enterococcus faecalis* are commonly associated with hospital acquired infections, because they readily form biofilms on instruments and medical devices. Biofilms are inherently more resistant to killing by antibiotics compared to planktonic bacteria, in part because of their heterogeneous spatial structure. Surprisingly, however, subminimal inhibitory concentrations (sub-MICs) of some antibiotics can actually promote biofilm formation. Unfortunately, much is still unknown about how low drug doses affect the composition and spatial structure of the biofilm. In this work, we investigate the effects of sub-MICs of ampicillin on the formation of *E. faecalis* biofilms. First, we quantified biofilm mass using crystal violet staining in polystyrene microtiter plates. We found that total biofilm mass is increased over a narrow range of ampicillin concentrations before ultimately declining at higher concentrations. Second, we show that sub-MICs of ampicillin can increase mass of *E. faecalis* biofilms while simultaneously increasing extracellular DNA/RNA and changing total number of viable cells under confocal microscopy. Further, we use RNA-seq to identify genes differentially expressed under sub-MICs of ampicillin. Finally, we show a mathematical model to explain this phenomenon.

¹This work was funded by The Hartwell Foundation Individual Biomedical Research Award and NSF CAREER 1553208 to KBW.

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Date submitted: 08 Nov 2016

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