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A non-destructive method for characterizing phenotypes and growth of a *Bacillus subtilis* biofilm using fluorescence microscopy STEPHAN KOEHLER, SEAS, Harvard, MA, USA, XIAOLING WANG, School of Mechanical Engineering, USTB, Beijing, China, JAMES WILKING, Chemical & Biological Engineering, Montana State University, USA, DAVE WEITZ, SEAS, Harvard, MA, USA — We develop an imaging technique for characterizing growth of biofilms using a triple fluorescent labeled strain for the three main phenotypes of a Bacillus subtilis biofilm on an agar substrate. We find that the biofilm does not flow across the substrate and thus growth is due to colonization at the periphery and thickening of the interior regions. We obtain local height and its composition of the three main phenotypes, which are motile, matrix-producing and sporulating, as well as the non-fluorescent material, which can be spores, dormant or dead cells or extracellular matrix. This technique is suitable for the study of biofilm growth and inhibition for different conditions such as biocides or bioremediation.

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