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Motility and peristaltic flow in maintaining microbiome populations. SEYED AMIR MIRBAGHERI, HENRY C. FU, The University of Utah — Bacteria are an important component of the microbiome in the digestive tract, and must be able to maintain their population despite the fact that the contents of the intestines are constantly flowing towards evacuation. Many bacteria accomplish this by colonizing the surfaces of the intestines where flows diminish, but some species live in the lumen. We attempt to address whether swimming motility of these species plays an important role in maintaining bacterial population in the face of peristaltic pumping out of the intestine. Using a two-dimensional model of peristaltic flows induced by small-amplitude traveling waves we examine the Lagrangian trajectories of passive bacteria as well as motile bacteria, which are treated as Brownian particles undergoing enhanced diffusion due to the bacteria's run-and-tumble motility. We examine how the densities of growing populations of bacteria depend on the combination of motility and peristaltic flow.

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