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Competitive Exclusion in Microbial Communities CHARLES FISHER, PANKAJ MEHTA, Department of Physics, Boston University — The competitive exclusion principle of ecology suggests that two or more species cannot coexist in a community while living off of the same resources. Therefore, only species that occupy different niches can coexist. The process of community assembly is also heavily influenced by neutral drift due to stochastic birth, death and immigration of species. Currently, there is no consensus on the relative importance of "niche" and "neutral" processes in community assembly. We develop a stochastic birth-death-immigration model with competition for resources to examine the relative importance of these processes in microbial communities, and search for signatures of competitive exclusion in a large dataset of microbial community compositions containing relative species abundance data for thousands of environments. In addition, we discuss the role of metabolism in defining microbial niches.

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