Abstract Submitted
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Engineering emergent multicellular behavior through synthetic adhesion[1] DAVID GLASS, INGMAR RIEDEL-KRUSE, Stanford University — In over a decade, synthetic biology has developed increasingly robust gene networks within single cells, but constructed very few systems that demonstrate multicellular spatio-temporal dynamics. We are filling this gap in synthetic biology's toolbox by developing an E. coli self-assembly platform based on modular cell-cell adhesion. We developed a system in which adhesive selectivity is provided by a library of outer membrane-displayed peptides with intra-library specificities, while affinity is provided by consistent expression across the entire library. We further provide a biophysical model to help understand the parameter regimes in which this tool can be used to self-assemble into cellular clusters, filaments, or meshes. The combined platform will enable future development of synthetic multicellular systems for use in consortia-based metabolic engineering, in living materials, and in controlled study of minimal multicellular systems.

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