

Abstract Submitted
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Magnetically-Actuated *Escherichia coli* System for Micro Lithography S. LAUBACK, E. BROWN, L. PÉREZ- GUZMAN, C. PEACE, C. PIERCE, B.H. LOWER, S.K. LOWER, R. SOORYAKUMAR, Ohio State Univ - Columbus — Technologies that control matter at the nano- and micro-scale are crucial for developing new engineered materials and devices. While the more traditional approaches for such manipulations often depend on lithographic fabrication, they can be expanded upon by taking advantage of the biological systems within a living cell which also operate on the nano- and micro- scale. In this study, a system is being developed to functionalize a targeted location on the surface of a chip with the protein AmCyan from transformed *Escherichia coli* cells. Using established methods in molecular biology where a plasmid with the amcyan gene sequence is inserted into the cell, *E. coli* are engineered to express the AmCyan protein on their outer surface. In order to transport the cells to the targeted location, the transformed *E. coli* are labeled with superparamagnetic micro-beads which exert directed forces on the cells in an external field. Preliminary results of the protein expression on *E. coli*, the transport of the cell through weak magnetic fields to targeted locations and the potential to transfer protein from the cell to the chip surface will be presented.

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