

Abstract Submitted
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Magnetically Directed Cell Co-Localization for Cell-Cell Interaction Studies EDWARD FELTON, DANIEL REICH, Dept. of Physics and Astronomy, Johns Hopkins University, CHRISTOPHER CHEN, Dept. of Bioengineering, University of Pennsylvania — The ability to create ordered patterns of cells has enabled new approaches to various areas of biological interest, such as tissue engineering, biosensing, and the study of interactions between cells. In this work, we apply forces to cells through binding with magnetic nanowires. The nanowires feature high remanent magnetization, allowing for effective manipulation in low-strength magnetic fields, and when used in conjunction with lithographically patterned magnetic microstructures can precisely position cells into predetermined locations. Chemical functionalization then confines the cells to these substrate areas. We have used this technique to create large numbers of isolated pairs of cells by magnetically guiding them to sites on cobalt and permalloy arrays. Further, the use of two different cell types leads to arrays with heterotypic cell pairs in numbers that exceed those attainable with random cell seeding. Initial experiments applying this magnetic cell trapping technique to perform biological studies of cell-cell interactions will also be described.

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