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Magnetically driven nanorod transport through Matrigel in vitro LAMAR MAIR<sup>1</sup>, RICHARD SUPERFINE<sup>2</sup>, University of North Carolina at Chapel Hill — The dense mesh of interwoven collagen and laminin sheets found in the extracellular matrix (ECM) presents a significant barrier for efficient and widespread delivery of particle-bound therapeutic drugs within the volume of a tumor. We use templated electrodeposition as an inexpensive means to creating highly uniform, calibrated, magnetic nanorods with process-defined dimensions. Specifically, we grow Cu/Ni multilayered rods and selectively etch Cu regions, successfully creating Ni nanorods with diameters ranging from 55 to 250nm. Novel to the field of micro-and nano-carrier research is our ability to observe single particles move through the ECM as AC or DC magnetic field gradients are applied. Using a microscope fitted with an in-house designed high throughput rheometer capable of applying magnetic field gradients to microliter-sized volumes we test the effect aspect ratio has on the efficacy of particle transport through Matrigel, as well as how the parameters of time-varying fields affect transport.

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