Abstract Submitted
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Guidance and detection of neuronal cells using Si nanomembranes[1] CRISTIAN STAII, WEINA PENG, HYUK JU RYU, DON E. SAVAGE, YU HUANG, SOOKIN NAM, JUSTIN WILLIAMS, ERIK DENT, MAX G. LAGALLY, SUSAN N. COPPERSMITH, MARK A. ERIKSSON, University of Wisconsin, Madison — "Lab-on-a-chip" microfluidic technology [1] has emerged as a powerful tool for studying biological systems. Unlike standard macro-scale systems used for decades, microfluidics allows the micro-environment of a neuronal cell culture to be finely regulated. The reduction in feature sizes gives control over fluid phenomena such as laminar flow, shear stresses, and velocity profiles. Here we present a new approach to "lab-on-a-chip" design for studying neuronal cells, integrating microfluidic systems with silicon nanomembrane-based microelectronics. We show that this technology permits rapid production of microchannels with a large variety of shapes/sizes, thereby allowing the exposure of neuronal cell cultures to multiple environments, both mechanical and chemical, simultaneously. In addition, these microfluidic channels can be easily integrated with silicon nanomembrane based electronics. [1] A.J.Blake, T.M.Pearce, N.S.Rao, S.M.Johnson and J. C. Williams, Lab Chip, 2007, 7, 842.

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