Abstract Submitted
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**Positioning and guidance of neurons on Au by directed assembly of proteins using Atomic Force Microscopy.**[1] CRISTIAN STAII, Department of Physics, University of Wisconsin, Madison, CHRIS VIESSELMANN, JASON BALLWEG, Department of Anatomy, UW-Madison, JUSTIN WILLIAMS, Department of Biomedical Engineering, UW-Madison, ERIK DENT, Department of Anatomy, UW-Madison, SUSAN COPPERSMITH, MARK ERIKSSON, Department of Physics, UW-Madison — The specific interactions between neurons and guidance factors as well as the mechanism of axonal navigation toward a target in the developing brain are not well understood. To address this problem we present a new approach for controlling the adhesion, growth and interconnectivity of cortical neurons on Au surfaces. Specifically, we use AFM nanolithography to immobilize extracellular matrix proteins at well-defined locations on Au surfaces, and show that these protein patterns can confine neuronal cells and control their growth and interconnectivity. We will compare this method with other nanofabrication techniques and discuss its main advantages: 1) the procedure is carried out in aqueous solutions, so that the proteins retain their bioactivity, 2) a high degree of control over location and shape of the protein patterns can be achieved, and 3) the minimum protein feature size can be as small as 50nm.

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