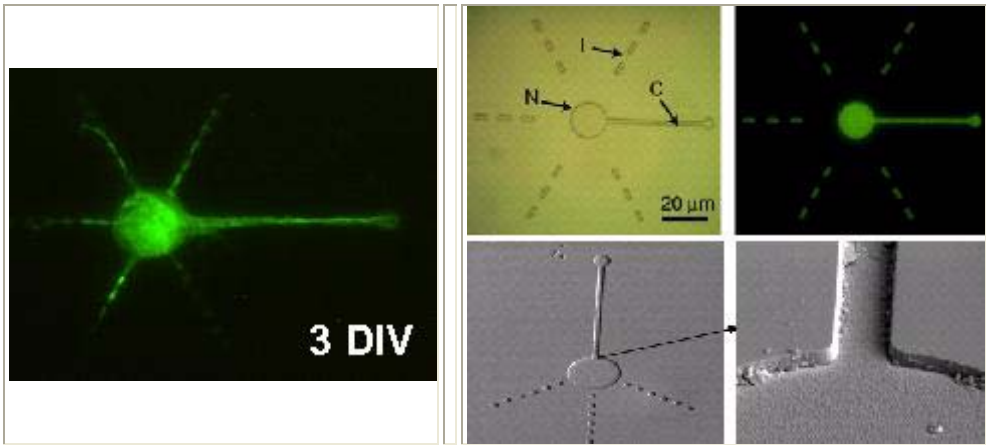
Neural tissue Engineering using Microfabricated Guidance Cues

Repair of damaged neural tissue requires the development of new tools for guiding the growth of living neurons. We are utilizing topographical and chemical cues to guide neurons into functional networks with controlled neuron polarity (axonal outputs and dendritic inputs). The cell guidance cues consist of trench structures etched into glass with poly-lysine coating the three surfaces of the trenches. Neuron polarity is controlled by suing nodes (N) to position cell bodies, continuous thin lines (C) to promote axon formation, and interrupted thin lines (I) to promote dendrite formation. After 2 days of in vitro (DIV) growth, axons have typically extended along continuous lines. After 3 DIV, dendrites begin to extend along interrupted lines.



For additional information or questions, please email us at BioNano@sandia.gov

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