Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Integration of neuroblasts into a two-dimensional small world neuronal network CASEY SCHNEIDER-MIZELL, MICHAL ZOCHOWSKI, LEONARD SANDER, University of Michigan — Neurogenesis in the adult brain has been suggested to be important for learning and functional robustness to the neuronal death. New neurons integrate themselves into existing neuronal networks by moving into a target destination, extending axonal and dendritic processes, and inducing synaptogenesis to connect to active neurons. We hypothesize that increased plasticity of the network to novel stimuli can arise from activity-dependent cell and process motility rules. In complement to a similar in vitro model, we investigate a computational model of a two-dimensional small world network of integrate and fire neurons. After steady-state activity is reached in the extant network, we introduce new neurons which move, stop, and connect themselves through rules governed by position and firing rate.

Casey Schneider-Mizell
University of Michigan

Date submitted: 21 Nov 2008 Electronic form version 1.4