1154-VF-970 **Jennifer Crodelle*** (crodelle@cims.nyu.edu), 251 Mercer St, New York, NY 10012. *A model for visual circuit development.*

The mammalian primary visual cortex contains neurons that respond preferentially to oriented visual stimuli (e.g., horizontal bars). In the mouse, neurons that prefer similar orientations are scattered randomly throughout the cortex, leading researchers to believe that the mouse visual cortex lacks organization. Experiments have shown, however, that cells sharing an orientation preference are preferentially connected by an electrical connection called a gap junction during the first postnatal week, while chemical synapses have not yet been formed. We construct a comprehensive model of the mouse visual cortex during the first postnatal week of development and analyze the effect of gap-junction coupling on the formation of synaptic connections. Through simulation of the model network, we show that cells containing gap junctions in the first postnatal week learn synaptic connections faster than those that are not connected by a gap junction. Then, we suggest sparse gap-junction coupling as a potential mechanism underlying the random orientation preference map measured in the adult mouse visual cortex. (Received September 12, 2019)