Establishment of visual maps during development

Alexandra Rebsam, INSERM U839, Institut du Fer à Moulin, Paris, France alexandra.rebsam@inserm.fr

The establishment of neural connections requires activity-dependent and independent mechanisms. The well-understood organization of the visual system comprises an excellent model to analyze the contribution of each of these mechanisms in brain wiring. Retinal projections form a visual map in their target organized in a topographic and eye-specific manner (Huberman et al., 2009). This specific organization is crucial for proper vision.

I will first review how retinal projections are guided and map into the brain, and the mechanisms involving guidance molecules and retinal activity (Petros et al., 2009; Huberman et al. 2009). Second, I will illustrate how a change in the guidance of retinal ganglion cell axons at the optic chiasm midline affect their projection using different examples (Rebsam et al., 2009; Rebsam et al., 2011). Finally, I will discuss the role of spontaneous retinal activity for the refinement of visual maps (Huberman et al., 2009) mentioning our recent unpublished work on the role of presynaptic release on retinal axon refinement.

Bibliography:


