Weekly Colloquium
Tuesday, 07/12/2016, 12:30pm, Billings Building – Rosedale Conference Room

“A polarizing view of Reelin signaling in cortical development”

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Research abstract:
The developmental origin of the apical dendrite is unclear. Cajal suggested that the dendrite emerges de novo after migration arrest while others have proposed that the apical dendrite emerges by transformation of the leading process of the migrating neuron. Similarly, it is not clear whether the secreted glycoprotein Reelin (RELN) controls migration and dendritic growth as related or separate processes. Our laboratory uses multiphoton microscopy to study the developmental dynamics of apical dendrite formation. These movies reveal the direct transformation of the leading process into the apical dendrite. This transformation occurs within two hours and is coupled to the successful completion of migration. Importantly, somal arrest occurs below the first stable branch point of the nascent dendrite, suggesting a possible mechanistic connection between dendritic branch formation and neuronal migration arrest. In the absence of Reelin, the nascent dendrite retracts from its normal target area leading to a profound loss of cellular polarity. These studies foreground the role of polarity signaling in dendritogenesis and provide insight into the function of RELN, a gene linked to both mental retardation and autism.

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