

Y. IKEUCHI Lab

[Development of the Nervous System]

Department of Materials and Environmental Science

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Biomolecular and Cellular Engineering

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How Neuron and Brain Form Their Shape?

Morphogenetic mechanisms of neuron and brain

Morphogenesis of neurons and brains is a fundamental step for development of the nervous system. We are interrogating molecular and genetic mechanisms underlying autonomous morphogenesis of neurons and brains during development. Our final goals are to understand developmental mechanisms for brain development, and to defeat developmental brain disorders including intellectual disability and autism spectrum disorders.

- ◆ **Dynamic Regulation of Protein Synthesis:** We are investigating cellular mechanisms for dynamic regulation of protein synthesis using biochemical and genetic engineering methods.
- ◆ **Morphogenesis of Primary Cilium:** We aim to understand brain development by revealing mechanisms underlying morphogenesis of neuronal primary cilium which functions as a cellular antennae.
- ◆ **Brain Morphogenesis Model:** By mimicking development of the brain in vitro, we are analyzing mechanisms of morphogenesis and compartmentalization of the brain.

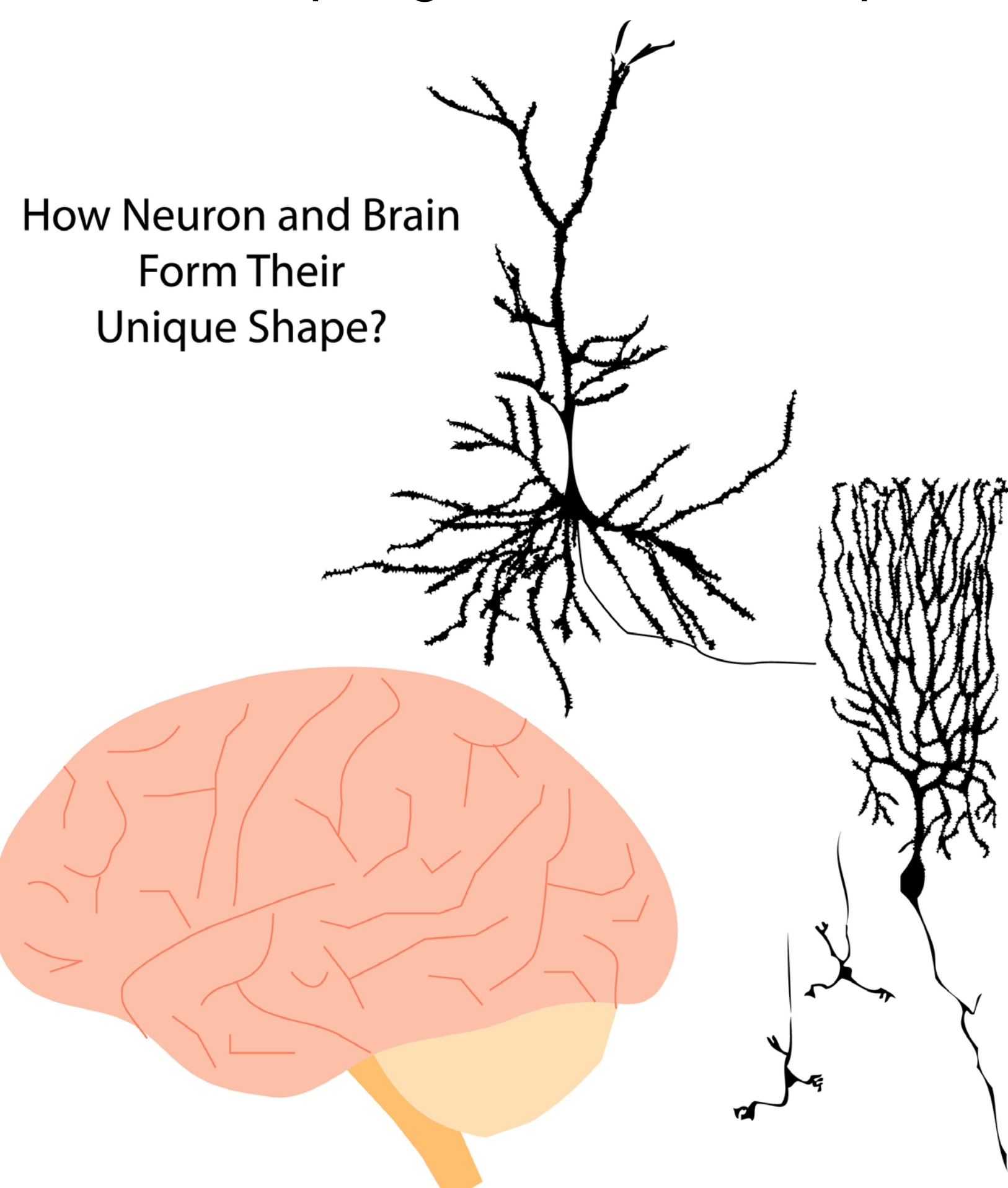


Fig 1. Morphology of Neurons and Brain

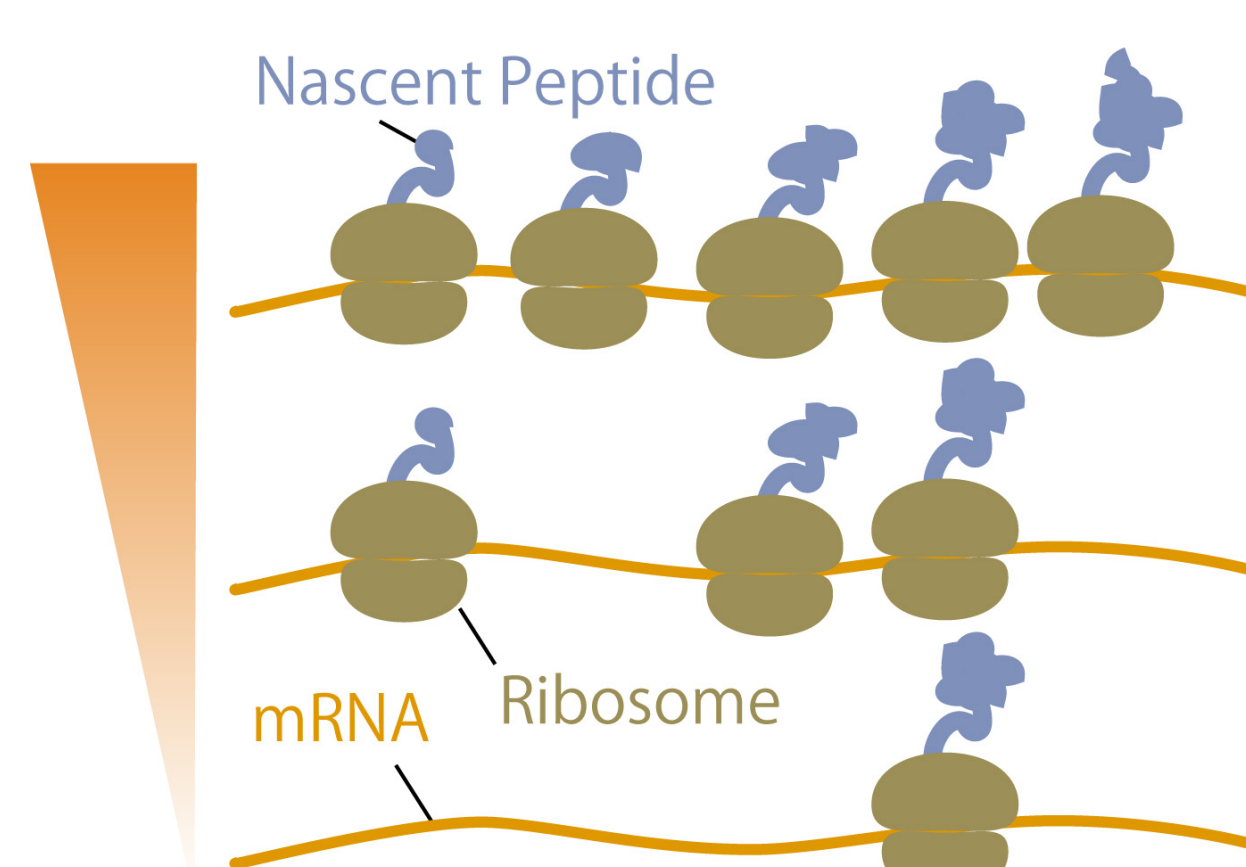


Fig 3. Schematic of Protein Synthesis

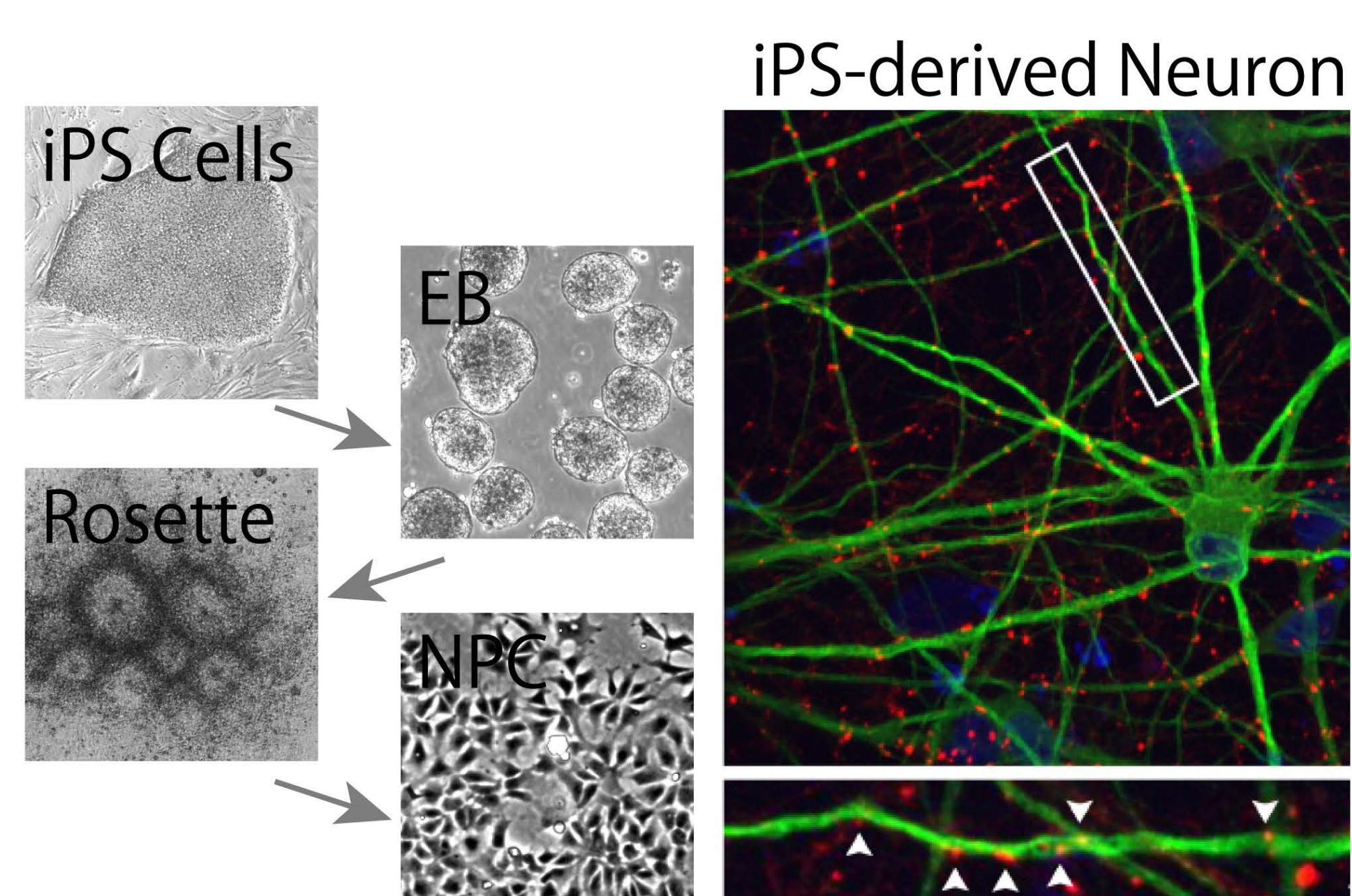


Fig 2. Differentiation of Neurons In Vitro

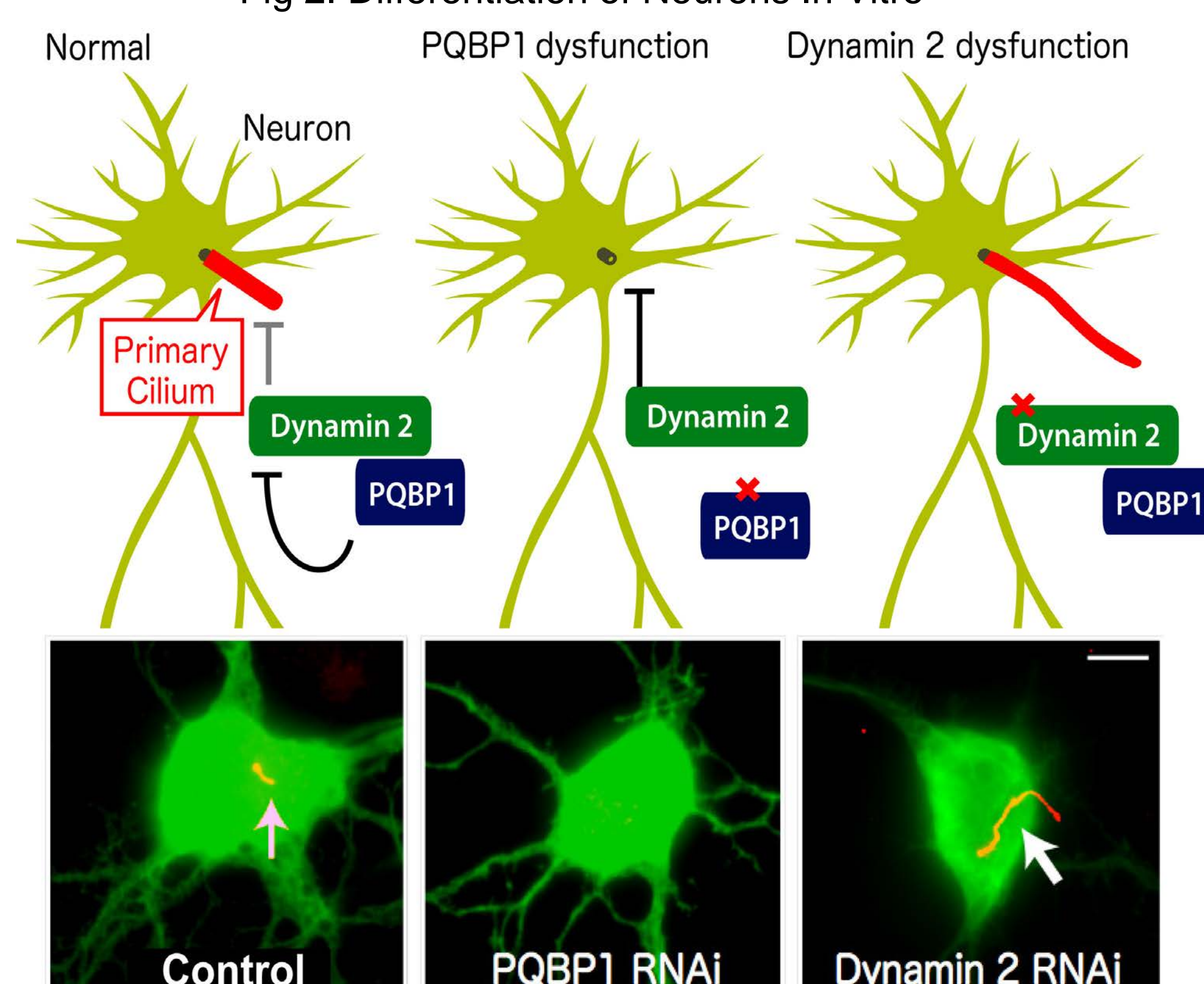


Fig 4. Regulation of Neuronal Primary Cilium