Mechanisms of Axonal Growth and Regeneration

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Neurons are the cellular basis of the circuits in the nervous system. In these circuits, neurons fulfill very different functions at different part of the cells. They receive signals from cells, integrate these signals and propagate them through their axon to eventually transmit the signals to other cells. This distribution of specialized functions is possible because neurons have a high degree of asymmetry (or polarity). We want to understand how neurons develop their polarity. How do neurons generate an axon? Addressing this fundamental question will also allow us to reactivate the polarity program under pathological conditions, such as a spinal injury, to induce axon regeneration.