Wnt ligands rescue neurite changes induced by porcupine inhibition

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Video Byte

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Abstract

Wnt signaling plays key roles in many processes, including cell polarity, proliferation, differentiation, and migration. The pathway is centrally involved in neurite and synapse development and maintenance. Wnt activity can be inhibited by Porcupine, an acylase that modifies Wnt ligands. A new study sought to understand how Wnt ligands affect neurite development. Using Wnt-C59, a Porcupine inhibitor, researchers blocked the secretion of endogenous Wnts in rat embryonic hippocampal neurons. They found that inhibiting Porcupine changed the morphology of the dendritic arbors and neurites of hippocampal neurons, while axonal polarity was not affected. β -catenin and Wnt3 levels decreased with Porcupine inhibition, while GSK-3 β increased. Adding exogenous Wnt3a, 5a, and 7a ligands rescued the changes in neuronal morphology. Wnt3a restored neurite length to near the control, while Wnt7a increased the neurite length beyond that of the control. These results suggest that Wnt ligands can restore neurite morphology in neurons treated with a Porcupine inhibitor, highlighting the potential of Porcupine as a molecular target for treating Wnt-related diseases.