Title: Microtubules in health and degenerative disease of the nervous system

Author: Andrew J. Matamoros Peter W. Baas

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Microtubules in health and degenerative disease of the nervous system

Andrew J. Matamoros and Peter W. Baas

Department of Neurobiology and Anatomy
Drexel University College of Medicine
2900 Queen Lane
Philadelphia, PA 19129

Address Correspondence to:
Peter W. Baas, Ph.D.
Department of Neurobiology and Anatomy
Drexel University College of Medicine
2900 Queen Lane
Philadelphia, PA 19129
Phone: 215-991-8291
Fax: 215-843-9082
Email: pbaas@drexelmed.edu

Highlights

- Microtubules are essential for development and maintenance of axons and dendrites.
- Microtubules are vulnerable in a variety of neurodegenerative diseases.
- Dysfunctional microtubules are at the center of neurodegeneration and injury.
- Microtubules undergo complex modifications and protein-protein interactions.
- Microtubule-mediated mechanisms are ripe with therapeutic targets.

Running Title: Microtubules in the nervous system

Abstract

Microtubules are essential for the development and maintenance of axons and dendrites throughout the life of the neuron, and are vulnerable to degradation and disorganization in a variety of neurodegenerative diseases. Microtubules, polymers of tubulin heterodimers, are intrinsically polar structures with a plus end favored for assembly and disassembly and a minus end less favored for these dynamics. In the axon, microtubules are nearly uniformly oriented with plus ends out, whereas in