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Titel des Beitrags: An assay to image neuronal microtubule dynamics in mice.

Abstract: Microtubule dynamics in neurons play critical roles in physiology, injury and disease and determine microtubule orientation, the cell biological correlate of neurite polarization. Several microtubule binding proteins, including end-binding protein 3 (EB3), specifically bind to the growing plus tip of microtubules. In the past, fluorescently tagged end-binding proteins have revealed microtubule dynamics in vitro and in non-mammalian model organisms. Here, we devise an imaging assay based on transgenic mice expressing yellow fluorescent protein-tagged EB3 to study microtubules in intact mammalian neurites. Our approach allows measurement of microtubule dynamics in vivo and ex vivo in peripheral nervous system and central nervous system neurites under physiological conditions and after exposure to microtubule-modifying drugs. We find an increase in dynamic microtubules after injury and in neurodegenerative disease states, before axons show morphological indications of degeneration or regrowth. Thus increased microtubule dynamics might serve as a general indicator of neurite remodelling in health and disease.

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