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Functional roles of microtubules in a giant presynaptic terminal

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Abstract

The functional roles of cytoskeletal elements actin and microtubule are well established in various cellular processes. However, their role in axon terminals is still unclear. Here, I started my thesis study by questioning the role of actin filaments at the calyx of Held presynaptic terminals in developing rats before and after hearing onset. Having observed that actin filaments are involved in synaptic vesicle recruitment in pre-hearing rats, but not in post-hearing rats, I then proceeded to address the functional roles of the other cytoskeletal element, namely microtubules in rats after hearing onset. I have used a combination of tools to address both the functional and morphological aspects. I found that both cytoskeletal elements play significant roles in regulating synaptic transmission.