



CDB SEMINAR

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Kyoto University School of Medicine

Friday, April 2, 2010

16:00~17:00 A7F Seminar Room

TRIOBP: a novel actin bundler that generates resilient rootlets of inner ear hair cell stereocilia

Summary

Inner ear hair cells detect sound through deflection of mechanosensory stereocilia. Each stereocilium is supported by a paracrystalline array of parallel actin filaments that are packed more densely at the base, forming a rootlet extending into the cell body. The function of rootlets and the molecules responsible for their formation are unknown. We found that TRIOBP, a cytoskeleton-associated protein mutated in human hereditary deafness DFNB28, is localized to rootlets. In vitro, purified TRIOBP isoform 4 protein organizes actin filaments into uniquely dense bundles reminiscent of rootlets, but distinct from bundles formed by espin, an actin cross-linker in stereocilia. We generated Triobp-4/5 knockout mice that are profoundly deaf. Stereocilia of Triobp-4/5 knockout mice develop normally, but fail to form rootlets and are easier to deflect and damage. Thus, F-actin bundling by TRIOBP provides durability and rigidity for normal mechanosensitivity of stereocilia and may contribute to resilient cytoskeletal structures elsewhere.

Host:

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