



CDB SEMINAR

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Ontario Cancer Institute, Canada

Tuesday, June 10, 2014

16:00~17:00 A7F Seminar Room

Coping with stress: Dynamic structural changes in α -catenin regulate the cadherin-actin linkage

Summary

α -catenin is an actin-binding protein responsible for connecting the cadherin-catenin complex to the actin cytoskeleton at adherens junctions. However, the mechanisms by which it maintains the cadherin-actin linkage at intercellular junctions under mechanical stress remain unclear. To better understand how α -catenin functions at this critical interface, we have recently determined crystal structures of α E-catenin in the autoinhibited state and the actin-binding domain of α N-catenin. Together with the small-angle X-ray scattering analysis of full-length α N-catenin, we deduced an elongated multidomain assembly of monomeric α -catenin that structurally and functionally couples the vinculin- and actin-binding mechanisms. Cellular and biochemical studies of α E- and α N-catenins show that α E-catenin recruits vinculin, an F-actin-binding protein, to adherens junctions more effectively than α N-catenin, partly owing to its higher affinity for actin filaments. We propose a molecular switch mechanism involving multi-state conformational changes of α -catenin. This would be driven by actomyosin-generated tension to dynamically regulate the vinculin-assisted linkage between adherens junctions and the actin cytoskeleton.

Host:

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