



The Role of Integrin-associated Protein "PINCH" in Kidney Development

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The Role of Integrin-associated Protein “PINCH” in Kidney Development

Abstract

PINCH (a particularly interesting new cysteine-histidine-rich protein) is a protein that binds with Integrin-linked kinase and Parvin, to form an IPP complex. This complex is formed only when integrin molecules are activated upon interaction with the basement membrane. The IPP complex then acts as a platform for other proteins to come together and regulate cell signaling to and from the extracellular matrix (ECM). This allows for various cellular activities to progress like cell adhesion, migration, proliferation, etc. There are two types of PINCH proteins, PINCH-1 and PINCH-2. Studies from our group have shown that the lack of PINCH-1 in the kidney results in a branching phenotype and smaller kidneys in mice. The cells showed diminished potential to adhere, migrate and proliferate. There is no significant difference in phenotype when PINCH-2 is deleted.

In the present study, we use conditional double knockout mice and cells in culture to look at the additive effects of the two PINCH proteins. Stained kidney cross sections will be analyzed and the PINCH null cells will be used in cell adhesion and migration studies.

We have preliminary data to show that the deletion of both PINCH-1 and PINCH-2 genes results in a severe developmental phenotype in mouse kidney and corroborates in vitro studies.

Keywords

PINCH; Integrin; Kidney development



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ABSTRACT

PINCH (a particularly interesting new cysteine-histidine-rich protein) is a protein that binds with Integrin-linked kinase and Parvin, to form an IPP complex. This complex is formed only when integrin molecules are activated upon interaction with the basement membrane. The IPP complex then acts as a platform for other proteins to come together and regulate cell signaling to and from the extracellular matrix (ECM). This allows for various cellular activities to progress like cell adhesion, migration, proliferation, etc. There are two types of PINCH proteins, PINCH-1 and PINCH-2. Studies from our group have shown that the lack of PINCH-1 in the kidney results in a branching phenotype and smaller kidneys in mice. The cells showed diminished potential to adhere, migrate and proliferate. There is no significant difference in phenotype when PINCH-2 is deleted.

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