Localization of polycystin-1 in human primary kidney cells:

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Introduction…

There is debate as to the subcellular localization of polycystin-1 (PC1) protein in renal epithelia. The literature strongly suggests that PC1 is present on the primary cilium and pericentriolar region. However, there is an older literature that shows that PC1 is present at the focal adhesions and lateral membranes.

Methods…

Here we used mixed primary human epithelial cells (obtained from Prof. Darren Wallace's tissue culture core at KUMC) to investigate the localization of PC1. These cells were grown on glass, gelatin and type IV collagen and were probed with mouse IgG1κ monoclonal antibodies to the N- (7E12) and C- (161F) termini of human PC1.

Results...

We showed that the subcellular localization of PC1 was dependent on cell type. Proximal tubule cells, as defined by *lotus tetragonolobus* lectin and N-CAM positivity, had PC1 localized to the alpha-actinin and talin positive focal adhesions. Collecting duct cells, positive for *Dolichos biflorus* lectin, had intense PC1 staining on their acetylated-alpha-tubulin positive primary cilia. However, there was very little intracellular staining for PC1 in these lectin positive cells. Most other cells (non collecting duct or proximal tubule cells) had a diffuse ER type staining throughout their cytoplasm. Cells that were actively migrating across the collagen coated glass had punctate PC1 staining on their filopodia and some of this staining was left behind on the substrate when a filiopodium retracted. There was also punctate staining on the glass surface due to PC1 positive exosomes that were adherent to the gelatin coating.

Conclusions...

PC1 can localize to multiple subcellular locations and this appears in part to be due to the cell type expressing the protein. These observations may explain some of the confusion in the literature. It will be interesting to define which splice forms of PC1 are responsible for the different subcellular localizations.

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