Cellular Prion Protein Alleviates Acute Kidney Injury by Interacting with TSPAN7 to Induce Formation of Migrasome

Methods

WT and Prnp$^{-/-}$ mice

Renal I/R injury model

Bilateral renal pedicle clamping for 35 min

Prp^{c} in the kidney

Gene and protein expression

Localization

Source

Prnp^{hi}Fib and HK-2 cells

Co-culture

H/R injury model

Migrasome

- Number
- Markers
- Morphology

Results

Post I/R injury

WT mice

α-SMA, Vimentin

12 hrs after I/R

Prp^{c} expression peak at 48 hrs

Prnp$^{-/-}$ mice

kidney damage

Damaged

Serum creatinine

I/R induced TSPAN7 overexpression

Transwell co-cultured

HK-2 cells

Prnp^{hi}Fib

Apoptosis of HK-2 cells

Formation of migrasome

Prp^{c} TSPAN7

Prp^{c} bind to TSPAN7 directly, co-located in the migrasome

TSPAN7

H/R induced migrasome formation

Damage to renal tubular epithelial cells

The Prion protein

Formation of migrasome

Damage to renal tubular epithelial cells

Conclusion Fibroblasts are the main source of endogenous Prp^{c} in the kidney. After injury, rapidly activated fibroblasts secrete Prp^{c}, which acts on the TSPAN7 protein in renal tubular epithelial cells, mediates the formation of migrasome, promotes the repair of renal tubular epithelial cells, and reduces AKI.

Weize Chen, Nana Song et al.

VA by Ahmed AkL

@aiakl2001

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