

# GRAPHICAL ABSTRACT SAMPLE WORK

**Phosphoenolpyruvate Carboxykinase 1-mediated cataplerosis is required to maintain mitochondrial fitness and to avoid kidney disease progression**

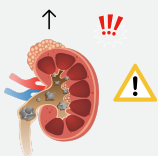
# Phosphoenolpyruvate carboxykinase 1-mediated cataplerosis is required to maintain mitochondrial fitness and to avoid kidney disease progression

## Methods

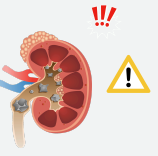
Mice & human patients



PCK1 kidney tubular specific KO/KI



Kidney disease mouse models



CKD/Control human biopsy samples

## Findings

Mouse models



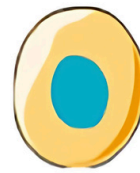
**PCK1-KO**

## Findings

Human samples



**PCK1 ↓**  
**Failed repair genotype**



**PCK1 ↑**  
**Differentiated cell**

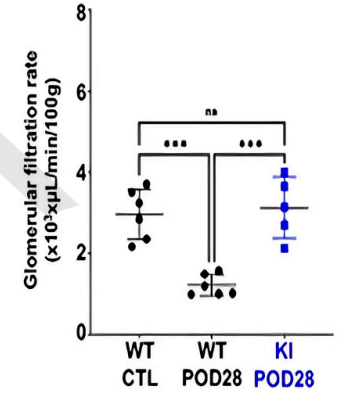
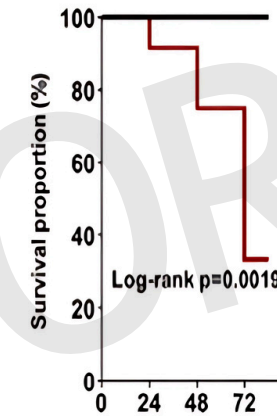
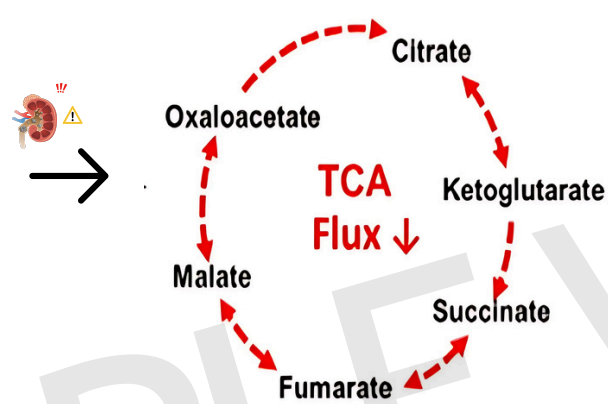
## PCK1-KO wild-type mice with AKI

↓ **Cataplerosis in PCK1-KO mice**

↓ **Survival after AKI in PCK1-KO mice**

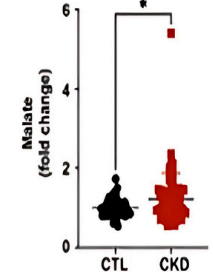
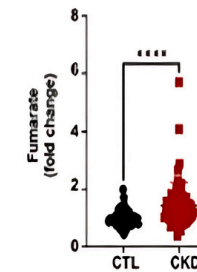
## PCK1-KI mouse model with CKD

↑ **GFR in PCK1-KI mice with CKD**



↓ **PCK1 is associated with a failed repair genotype**

↓ **Cataplerosis in control and CKD kidney samples**



This Image Adapted From Dalga, D., Rinaldi, A., Fu, X., Chanvillard, L., Huber, A., Faivre, A., Jaques, D., Berchtold, L., Boccard, J., Arnoux, G., Lyon, A., Rutkowski, J. M., Gex, Q., Paolucci, D., Kreuzfeld, M., Cagarelli, T., Lutz, L., Longchamp, A., Moll, S., ... de Seigneux, S. (2025). Phosphoenolpyruvate carboxykinase 1-mediated cataplerosis is required to maintain mitochondrial fitness and to avoid kidney disease progression. *Kidney International*. <https://doi.org/10.1016/j.kint.2025.06.018>

**CONCLUSION:** Maintenance of cataplerosis is an important factor of tubular physiology and repair, with PCK1 serving as a causal and potential therapeutic target in this process. Restoration of PCK1 enhances mitochondrial health, reducing the progression to kidney inflammation and fibrosis.