INDUCTION OF FERROPTOTIC DEATH IN HUMAN PRIMARY PROXIMAL TUBULAR EPITHELIAL CELLS (PTEC) DURING ADENINE-INDUCED CHRONIC KIDNEY DISEASE

MA Khan1,2, P Nag2,3, KTK Giuliani2,3, X Wang2, A Grivei2,3, WE Hoy1,2,3, HG Healy1,2,3, V. Diwan1, GC Gobe1,, AJ Kassianos2,3

1NHMRC CKD CRE (CKD.QLD), Univ Queensland, Brisbane, Australia; 2Conjoint Internal Medicine Laboratory, Chemical Pathology, Pathology Queensland, 3Kidney Health Service-RBWH, Brisbane, Australia.

Background

- Chronic kidney disease (CKD) is a global health burden, increasing in incidence in developed and developing countries.
- Adenine diet-induced CKD is a tubular crystalline nephropathy that is a well-accepted pre-clinical model of CKD.
- Adenine-induced PTEC injury and loss are believed to be related to oxidative stress.
- However little is known regarding the mechanisms of injury that cause PTEC loss.
- In this study, modes of adenine-induced cell death were investigated in human primary PTEC.

Methods

- Primary Human PTEC isolation and Expansion
- Cellular viability assay by flow cytometry (Annexin-V/Propidium Iodide)
- Mitochondrial function by flow cytometry (JC-1 Staining; MitoSOX)
- Cell death pathways by Western blotting

Conclusions

- Ferroptosis, a form of iron-dependent programmed cell death characterized by the accumulation of lipid peroxides, occurs in human primary PTEC in adenine-induced model of CKD.
- Baicalein, a plant-based flavonoid compound, inhibits ferroptotic death of adenine-treated PTEC.
- The anti-ferroptotic mechanisms of baicalein are now being explored for therapeutic translation in the clinical management of adenine-induced CKD.

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- For further information, please contact Muhammad Ali Khan (muhammad.a.khan@uq.edu.au)