



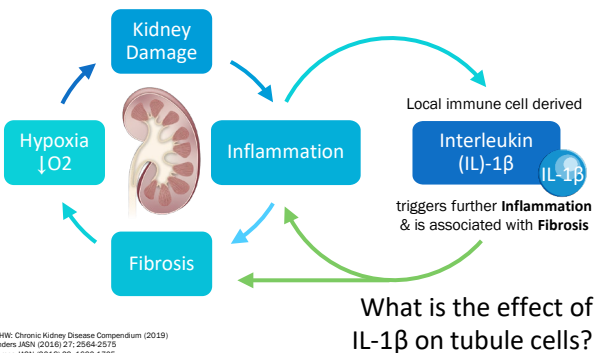
Pro-inflammatory Interleukin (IL)-1 β signalling pathways in Chronic Kidney Disease (CKD)

Kurt Giuliani^{1,3}, Anca Grivei^{1,2}, Purba Nag^{1,2}, Xiangju Wang^{1,2}, Jacobus Ungerer^{2,3}, Josephine M. Forbes^{3,4}, Andrew J. Kassianos^{1,3} and Helen Healy^{1,3}

¹Kidney Health Service, RBWH; ²Conjoint Internal Medicine Laboratory, Chemical Pathology, Pathology Queensland; ³Faculty of Medicine, University of Queensland; ⁴Mater Research Institute, TRI

1 Introduction

CKD has no cure
1 in 10 Australians have detectable CKD¹



2 Methodology

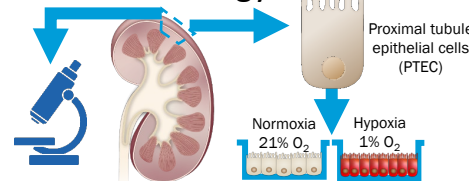


Fig 1. Healthy (non-fibrotic) and diseased (fibrotic) portions of nephrectomised kidneys were processed for ex vivo histological staining. In addition, human primary PTEC were purified from healthy kidney tissue for *in vitro* cell culture and treatment under normoxic (21% O₂) or hypoxic (1% O₂) conditions.

3 Hypoxic PTEC express IL-1RI in the presence of IL-1 β

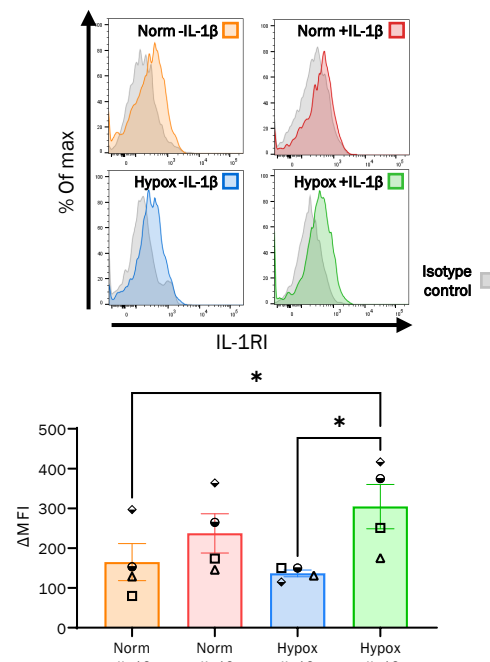


Fig. 2: (Top panel) Representative IL-1RI expression on proximal tubule epithelial cells (PTEC) treated with IL-1 β following 48hrs of conditioning under normoxic or hypoxic conditions. (Bottom panel) ΔMFI of IL-1RI expression on PTEC treated with vehicle or IL-1 β under normoxic or hypoxic conditions. (* p < 0.05; n = 4 individual patients)

4 Fibrotic kidney sections show tubular IL-1RI expression

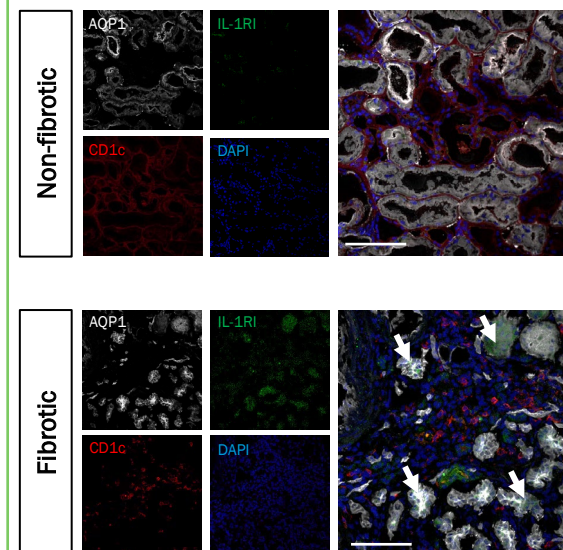
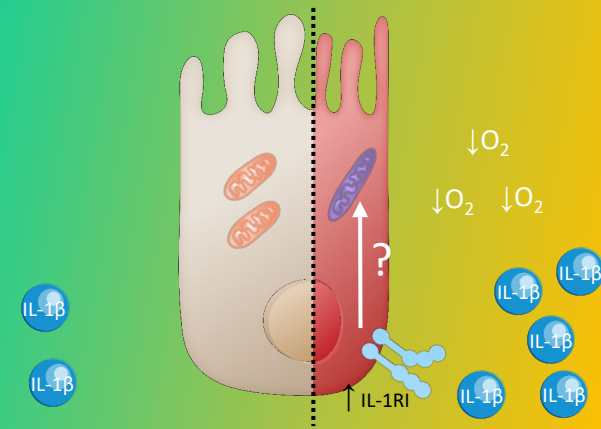


Fig. 3: Non-fibrotic (top) and fibrotic (bottom) kidney sections stained for Aquaporin-1 (AQP1; white), myeloid dendritic cells (CD1c; red), IL-1RI (green), and nuclei (DAPI). Arrows indicate tubules with positive IL-1RI expression. Scale bar = 100 μ m.

5 Hypoxia & IL-1 β upregulate PTEC IL-1RI expression and may exacerbate kidney dysfunction and fibrosis



6 Future Work

Investigate the consequences of IL-1 β in the kidney tubule:

- 1) Transcriptomic
- 2) Protein expression changes
- 3) Mitochondrial changes

This research was supported by funds from Pathology Queensland, the Kidney Research Foundation and National Health and Medical Research Council (NH&MRC) Project Grants (GNT1099222 and GNT1161319). K.G. is supported by an Australian Government Research Training Program (RTP) Scholarship. We also wish to thank the tissue donors for provision of renal bio-specimens, staff of the RBWH Kidney Health Service and Pathology Queensland. For further information, please contact A/Prof Helen Healy (Helen.Healy@health.qld.gov.au).



Kidney Research Foundation