

Extensive connexin expression in preglomerular but not postglomerular vasculature

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Abundant mRNA for connexin (Cx) 37, 40 and 43 has been detected in intra-renal vasculature¹, however a comprehensive analysis of protein expression, other than Cx40, has not been made²⁻⁴. Our aim was to study expression of Cxs37, 40 and 43 in intra-renal vasculature of adult mice. Male C57BL/6 mice (10-16 weeks) were deeply anaesthetised (rompun/ketamine 5/25mg/kg body wt. i.p.), the kidneys fixed in ice-cold acetone and immunohistochemistry performed on cryosections (30µm) using subtype specific Cx antibodies. Double labelling with endothelial (EC) and smooth muscle cell (SMC) markers was undertaken to identify the cellular site of Cx expression. Cxs37, 40 and 43 were consistently detected in ECs of the renal, lobar, arcuate and interlobular arteries and afferent arterioles, although Cx43 expression was less in the renal and arcuate arteries. No Cx staining was found in SMCs of the renal and lobar arteries, however Cx37 was detected in the arcuate and interlobular arteries. In the afferent arterioles, Cx37 was consistently detected in the SMCs while Cx40 was only occasionally found and Cx43 was absent. In the renin secreting cells, both Cxs37 and 40 were found. In contrast, in the efferent arterioles, only Cx43 was detected in the ECs and no Cx expression was found in the SMCs. Within the glomeruli, Cx40 was abundantly expressed in the mesangial cells while Cx37 was limited to the vascular pole. Both Cxs37 and 40 were highly expressed in the extraglomerular mesangial cell cushion between the afferent and efferent arterioles. Results suggest that there is extensive coupling within and between the renal vasculature and the juxtaglomerular apparatus on the preglomerular side while there is little evidence that this cell coupling extends into the efferent arteriole.

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