

LANDMARKS FROM KIDNEY PRIMORDIA FOR ORGAN PRINTING STRATEGIES

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Bio printing of progenitor cells for organs such as the kidney offers a great promise to envision capacity to restore in future lost organ functions. We have developed a series of renal tissue engineering technologies. The kidney organ primordia can be separated to its epithelial and mesenchymal tissue components containing the nephron progenitor cells (NPCs). The NPCs can be dissociated and the constituent cells separated or novel cells included to fate map their differentiation. Specific extracellular matrix components and small molecules can then be tested for function in such reconstituted kidney. Moreover fate of single GFP+ cells is feasible in *ex vivo* culture with high resolution in 4D time-lapse organ/organoid culture. The NPC fate can be induced with a cocktail of factors to embryonic stem cells and iPS cells and genes targeted by the Crisp approach. When these are conjugated with embryonic kidney tissue whole kidney can be reconstituted. The Cre knock in model-based mice has offered identification of the kidney cell lineages that have provided the digital maps to print kidney organ reconstitution scaffolds. These data will be presented as a strategy to obtain bioengineered kidney.