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Insights into kidney stem cell development and regeneration using zebrafish

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Abstract

Kidney disease is an escalating global health problem, for which the formulation of therapeutic approaches using stem cells has received increasing research attention. The complexity of kidney anatomy and function, which includes the diversity of renal cell types, pose formidable challenges in the identification of methods to generate replacement structures. Recent work using the zebrafish has revealed their high capacity to regenerate the integral working units of the kidney, known as nephrons, following acute injury. Here, we discuss these findings and explore the ways that zebrafish can be further utilized to gain a deeper molecular appreciation of renal stem cell biology, which may uncover important clues for regenerative medicine.

Key words: kidney; renal stem cell; renal progenitor; regeneration; nephron; blood filter; renal corpuscle; tubule

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