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# Generation of a Transgenic Zebrafish Line for Fate Mapping Kidney Stem Cells

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GENERATION OF A TRANSGENIC ZEBRAFISH LINE FOR FATE MAPPING  
KIDNEY STEM CELLS

A Thesis

Submitted to the School of Graduate Studies and Research

in Partial Fulfillment of the

Requirements for the Degree

Master of Science

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Indiana University of Pennsylvania  
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We hereby approve the thesis of

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Kidney disease is a serious health concern worldwide. With no known cure, current treatments include dialysis or organ transplant, both of which have limitations. Current constraints regarding the use of stem cell therapies in humans include the lack of regenerative capabilities in mammals. In contrast, studies have shown that zebrafish possess stem cells that allow them to regenerate damaged kidneys. Here, we set out to create a transgenic zebrafish line that will be used as a genetic tool to fate map zebrafish kidney stem cells during regeneration. This reporter line will not only help to characterize the self-renewal and multipotent potential of the adult zebrafish kidney stem cell during regeneration, but it will also help elucidate the role of these cells during kidney development. By better understanding the mechanisms involved in zebrafish kidney regeneration, analogous therapies can be devised to alleviate the widespread problem of kidney disease in humans.