BIOGRAPHICAL SKETCH

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Personal Statements

The Tao lab at MUSC was established on a broad background in myocardial regeneration, with expertise in mouse cardiac survival surgery, Crispr-Cas9 technology, and 2nd generation sequencing. My colleagues and I have laid the groundwork for our future research in cardiac regeneration. Our previous work demonstrated a beneficial role of *Pitx2* in myocardium after substantial injury. We showed that sufficient expression of *Pitx2* could rescue mature myocardium from severe damage, and *Pitx2* interacts with Hippo-Yap signaling, and functions downstream of Nrf2, a well-studied master regulator of oxidative stress. Currently I am investigating the regulatory role of *Pitx2* and its binding partners in cardiac homeostasis, funded by an AHA Scientist Development Grant. The current projects in our lab include the expansion of *Pitx2* studies to further dissect the pathway, as well as screening for other beneficial factors. The technical strategies in Tao lab typically start with unbiased screening based on CRISPR technology and Next Generation Sequencing. Candidate pathways will be validated in cell lines and tissue samples with molecular biology and biochemical experiments. Eventually, each hypothesis will be examined using an adult murine cardiac survival surgery model, where artificial myocardial infarction is induced by occluding the left anterior descending coronary artery. The effect of gene manipulation on the scarring and recovering of the myocardium will be assessed by non-invasive echocardiography, histology, immunofluorescence, and biochemistry.

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