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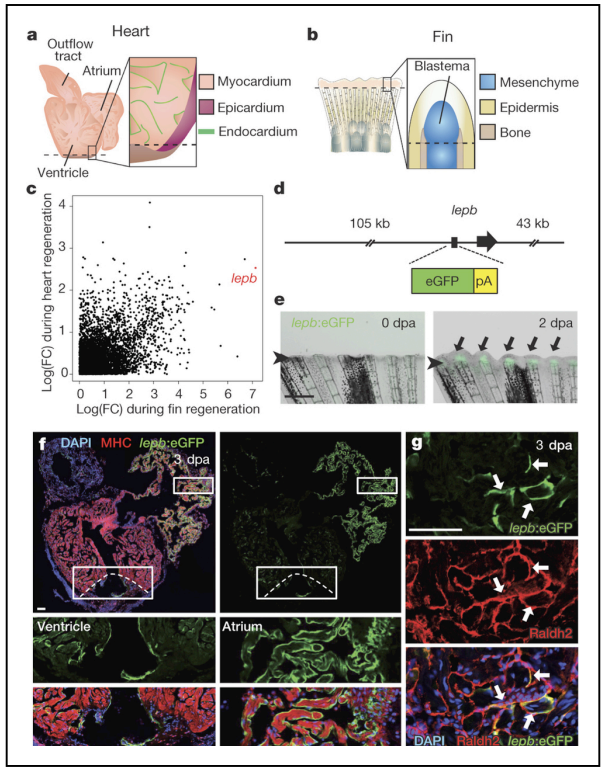

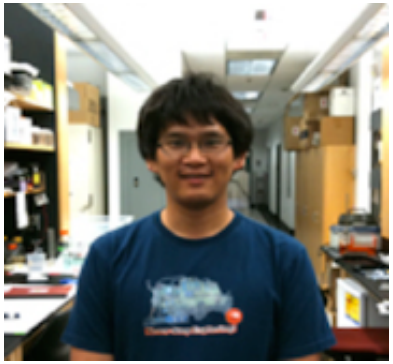

"Fishing for the Regulators of Tissue Regeneration"

Thursday, February 16, 2017

11:00-11:50 am

CCRC Auditorium

THE CENTER FOR
Molecular Medicine
The University of Georgia

Host: Steve Dalton

Fishing for the Regulators of Tissue Regeneration

Presentation Abstract

The capacity for complex tissue regeneration is unevenly distributed among vertebrate tissues and species. While mammals have limited regenerative capabilities, zebrafish possess a remarkable potential to regenerate tissues such as amputated appendages and damaged heart muscle. However, little is known about the molecular basis for the presence or absence of regenerative capacity, which likely involves changes in both cell-intrinsic and cell-extrinsic factors. For instance, zebrafish are capable of regenerating amputated fins throughout life, but regenerative capacity of pectoral fins is variable between genders. I discovered that regeneration of male pectoral fins is impaired by inhibitory signal from reproductive tissues, indicating that there would be a trade-off between sex and regeneration during evolution. In addition, I have identified members of a valuable class of epigenetic factors: tissue regeneration enhancer elements that are activated in regenerating tissues. Using genome-wide analysis and transgenic assays, I found that there are enhancers with regeneration-restricted activity that are linked to *leptin b* (*lepb*). The activity of the *lepb*-linked regeneration enhancer (*LEN*) can be harnessed to modulate tissue regenerative capacity. These results provide evidence for 'Tissue Regeneration Enhancer Elements' (TREEs) that trigger gene expression in injury sites and can be engineered to modulate the regenerative potential of vertebrate organs. In this presentation, I will discuss how environmental, epigenetic, and genetic factors influence tissue regeneration in zebrafish and suggest new therapeutic strategies for tissue repair.

Dr. Kang received his PhD in developmental genetics in 2010 from Seoul National University. He came to the US in 2011 as a postdoctoral fellow with Kenneth Poss at Duke University, where he is now a medical instructor. Dr. Kang recently received an American Heart Associate Scientist Development grant. His research interests include genetic and epigenetic factors controlling tissue regeneration.