Washington University in St. Louis
Washington University Open Scholarship

Spring 2018

Washington University
Senior Honors Thesis Abstracts

Spring 2018

FGF Signaling Role in Bone Homeostasis

Josh Langberg
Washington University in St. Louis

Follow this and additional works at: https://openscholarship.wustl.edu/wushta_spr2018

Recommended Citation

Langberg, Josh, "FGF Signaling Role in Bone Homeostasis" (2018). *Spring 2018*. 75.
https://openscholarship.wustl.edu/wushta_spr2018/75

This Abstract for College of Arts & Sciences is brought to you for free and open access by the Washington University
Senior Honors Thesis Abstracts at Washington University Open Scholarship. It has been accepted for inclusion in Spring 2018 by an authorized administrator of Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu.

FGF Signaling Role in Bone Homeostasis

Josh Langberg

Mentor: Craig Smith

Fibroblast growth factors—FGFs—have proven to be strong regulators of embryonic development and homeostasis in many organ systems. When bound to FGFR1 and FGFR2 in bone cells, they play crucial roles in proliferation, homeostasis, and apoptosis processes. The double knockout of FGFR1 and FGFR2 results in a unique phenotype found in osteocytes in cortical bone. This was done using osteocalcin CRE, which targets mature osteoblasts. In mice between 12-16-weeks-old, the cortical bone thickens significantly, and the marrow cavity is eventually overtaken by mineralized cortical bone. There seems to be an opposite phenotype, however, at three weeks of age. Preliminary data shows that adolescent three-week-old mice have less bone than the wild type controls, but this has to be confirmed with further experimentation. This project intends to demonstrate the role of FGF signaling in adult bone homeostasis. Osteocalcin CRE, FGFR1 FLOX, and FGFR2 FLOX that target adult osteoblasts have increased osteocyte cell death even at early ages which significantly affects bone homeostasis. Using TUNEL staining, which detects cells undergoing apoptosis, and EDU staining that marks proliferation of osteoblasts, we intend to solidify our observations that FGF signaling is a survival factor for osteocytes and plays a significant role in bone homeostasis.