



*Division of Biology Presents:*

**Wnt Signaling Regulates Cellular Development and Regeneration  
in the Zebrafish Lateral Line**

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The zebrafish lateral line system has proven to be an invaluable model for the study of mechanosensory hair cell biology. The morphological and genetic profiles of lateral line hair cells are strikingly similar to the mechanosensory hair cells of the auditory and vestibular systems in the inner ear, with the advantage of being easily accessible to analysis and manipulation. In addition, lateral line hair cells in the zebrafish possess a robust ability to regenerate throughout the lifespan of the animal, which contrasts with the lack of regeneration seen in the mammalian inner ear. The lateral line system is composed of sensory organs, called neuromasts, that contain mechanosensory hair cells and surrounding populations of support cells, which proliferate and differentiate to replace damaged cells. Canonical Wnt signaling has been shown to be a core pathway in regulating zebrafish posterior lateral line regeneration. To elucidate the precise role of Wnt signaling we used mutant zebrafish strains which alter the Wnt pathway. Two of these lines alter Wnt signaling in opposing directions; *krm1nl10* results in overactive Wnt signaling and *lef1nl2* results in reduction of Wnt signaling. In our *krm1nl10* mutants, we find that development of support cells is significantly increased in lateral line neuromasts and that this increase in support cells results in supernumerary hair cell development and regeneration. We found that this excess regeneration occurs in the absence of increased proliferation, in contrast to the previously described role of Wnt signaling in the lateral line. This work will allow us to understand the biology of mechanosensory hair cells, and how regeneration might be promoted following damage. This research is supported by NIGMS 1R16GM146690-01.

If you would like to visit with Dr. Hillary McGraw, please contact Dr. Jocelyn McDonald at [jmcdona@ksu.edu](mailto:jmcdona@ksu.edu).

*Coffee & snacks served preceding the seminar in Ackert Hall, Room 225*