Institute of Medical Biology
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# Seminar Announcement

***- All Are Welcome -***



**Speaker** : **Dr Wei-Meng Woo**
*Stanford University School of Medicine*

**Title** : ***"Hedgehog signaling regulation of the hair follicle microenvironment"***

**Date** : **13 May 2013 (Monday)**

**Time** : **2:00 pm – 3:00 pm**

**Venue** : **IMB Seminar Room, Level 6 Neuros**

**Host** : **Dr Colin Stewart**
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***Abstract:***
During hair follicle (HF) morphogenesis, the major microenvironment cell type, dermal papillae (DP), function as mesenchymal signaling centers that cross-talk with the overlying epithelium to regulate morphogenesis. While the DP regulates HF formation, relatively little is known about the molecular basis of DP formation. The morphogen Sonic hedgehog (Shh) is known for regulating HF epithelial growth with excessive signaling resulting in basal cell carcinomas. We investigate how dermal-specific Shh signaling contributes to DP formation and hair growth. Using a Cre-lox genetic model and RNAi in HF reconstitution assays, we demonstrate that dermal Smoothened (Smo) loss-of-function results in the loss of DP precursor and a stage 2 HF arrest phenotype reminiscent of Shh null. However, dermal Smo does not regulate cell survival or epithelial proliferation. Rather, molecular screening and immunostaining studies reveal dermal Shh signaling controls the expression of a subset of DP-specific signature genes. Using a hairpin/cDNA lentiviral system, we show that overexpression of the Shh dependent gene Noggin, but not Sox2 or Sox18, can partially rescue the dermal Smo knockdown HF phenotype by increasing the expression of epithelial Shh. Our findings suggest that dermal Shh signaling regulates specific DP signatures to maintain DP maturation while maintaining a reciprocal Shh–Noggin signaling loop to drive HF morphogenesis. As Hedgehog signaling to the stroma is critical in a number of Hedgehog-dependent epithelial tumors in humans, these results may facilitate new cancer therapeutics.


***About the Speaker:***
Wei-Meng is currently a research associate in Dr Anthony Oro's lab at Stanford University. She received her Bachelor degree from National Cheng-Kung University, and her Master degree in Biochemistry from the National Yang-Ming University, both in Taiwan. After a few years as a research assistant, she decided to pursue a PhD degree, and later received her PhD in Molecular, Cellular, and Developmental Biology from University of California, Santa Cruz. She did her master's training with Dr. Sue Lin-Chao, studying prokaryotic RNA biology. Her PhD training was with Dr. Andrew Chisholm, studying *C. elegans'* epithelial morphogenesis. To further pursue a research interest in cell signaling and tissue orphogenesis, she joined Dr. Anthony Oro's laboratory for postdoctoral training. During her postdoctoral work, she used the mammalian hair follicle as a model to examine epithelial-mesenchymal signaling interactions during tissue morphogenesis, with a focus on paracrine Hedgehog pathway regulation on the hair follicle dermal microenvironment, or the dermal papilla. To facilitate cell type specific gene functional studies, she has established a rapid hair reconstitution genetic assay that combines lentiviral based gene manipulation and primary skin cell transplantation technique. She also contributed to a number of collaborative studies, investigating the in vivo function of new Hedgehog pathway regulators and the formation of a perivascular microenvironment for hair follicle stem cells.

In her future research program, she will further examine gene regulation on the formation and functions of the hair follicle dermal microenvironment. Initially she will focus on the mechanisms two putative new Hedgehog pathway regulators that she identified, dissecting their molecular mechanism and in vivo function in hair follicle morphogenesis and in skin cancer. In the long term she plans to study the interaction of the various hair follicle microenvironment cell types during development and regeneration.