



# CDB SEMINAR

## Utpal Banerjee

University of California, Los Angeles

Thursday, December 6, 2012

15:00~16:00 A7F Seminar Room

### **Systemic control of hematopoietic progenitors in *Drosophila***

Dr. Banerjee is a prominent *Drosophila* geneticist. He has greatly contributed to understanding of signaling that regulates eye development. He has also developed the *Drosophila* hematopoietic system as an excellent genetic model in this field.

#### **Summary**

Stem and progenitor cell maintenance through direct signaling interactions with a supportive microenvironment, collectively referred to as a niche, is now a well studied phenomenon in multiple systems and organisms. In contrast, extrinsic signals (originating from outside the niche) that may control progenitor cell behavior are not well understood and remain an important area of investigation. The *Drosophila* lymph gland is a hematopoietic tissue that contains multipotent hematopoietic progenitors, mature macrophage-like blood cells, and a supportive niche that maintains progenitor quiescence. The lymph gland system is a well-characterized hematopoietic model that utilizes conserved molecular mechanisms for blood development including Hedgehog, PDGF, Wnt and ROS, which locally regulate progenitor maintenance. Additionally, we have demonstrated that systemic signals, such as insulin, secreted from the brain-derived neuroendocrine cells are also required for maintaining the lymph gland progenitors.

In recent unpublished studies, we have discovered that GABA, secreted from a subset of neuroendocrine cells, different from those that produce insulin, can be detected in the circulating blood and can be directly sensed by blood progenitors and is important for their maintenance. Interestingly, this GABA signal is controlled by olfactory sensory input. Taken together, this study highlights a novel neuro-hematopoietic axis that links olfactory stimulation to hematopoietic stem-like progenitor maintenance.

#### **Host:**

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