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TEMASEK LIFESCIENCES LABORATORY

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The Auditorium (Level 1)

Hosted by: Dr Cai Yu

Precise coordination of mosquito egg production by hormones and miRNAs

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Dr. Zhu received his Ph.D. degree from the Chinese Academy of Sciences. He went to the United States for his postdoctoral training. In 2007, he became a faculty member in the Department of Biochemistry at Virginia Tech, and has since been promoted to Full Professor. Dr. Zhu's research interest lies in signal transduction and gene regulation.

Mosquitoes are responsible for the transmission of some devastating infectious diseases, such as malaria, yellow fever, dengue fever, chikungunya fever and Zika virus. For many of the diseases, there are no preventative vaccines or specific treatment. A better understanding of mosquito biology is therefore of paramount importance for developing effective vector control strategies to disrupt the transmission of mosquito-borne diseases.

Following adult emergence, mosquitoes rely on teneral nutritional reserves accumulated in the larval stage to meet initial metabolic requirements and to find food. Both female and male mosquitoes feed on plant nectar and fruit juices for energy. To produce eggs, females need a blood meal to make egg proteins and provide energy for reproduction. The metabolic shifts and egg maturation are tightly controlled by insect hormones and miRNAs. New discoveries on the hormone signaling pathways and mosquito miRNA interactome will be introduced in this presentation.

Recent Publications:

1. Liu, P., Fu, X., and **Zhu, J.** (2018) Juvenile hormone-regulated alternative splicing of the taiman gene primes the ecdysteroid response in adult mosquitoes. *Proceedings of the National Academy of Sciences of the United States of America.* 115: E7738-E7747.

2.Fu, X., Dimopoulos, G., and **Zhu, J.** (2017) Association of microRNAs with Argonaute proteins in the malaria mosquito *Anopheles gambiae* after blood ingestion. *Scientific Reports*, 7(1):6493.

3. Liu, P., Peng, H., and **Zhu, J.** (2015) Juvenile hormone-activated phospholipase C pathway enhances transcriptional activation by the methoprene-tolerant protein. *Proceedings of the National Academy of Sciences of the United States of America,* 112: E1871-1879.