Institute of Molecular and Cell Biology
A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Prof. Wanjin Hong:

Date: 25 September 2018, Tuesday
Time: 11:00AM – 12:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Dr. Bao Zhen Tan, FPR Research Scientist, Lab for Neural Circuitry of Learning and Memory, RIKEN Center for Brain Science, Japan
Title: A circuit-to-molecular mechanism for controlling memory strength during recall

Memories can be modified when they are recalled through reconsolidation, a process that engages gene transcription and translation in memory storage areas. How distributed brain circuits alter memories during recall by directing molecular signaling in specific cell populations which store these memories is not known. Using aversive emotional learning task in rodents, we show that brainstem noradrenaline inputs to the amygdala, a brain region which stores aversive memories, control memory reconsolidation. During reconsolidation, these inputs regulate the nuclear translocation of CREB-regulated transcriptional coactivator-1 (CRTC1), a molecule important for synapse-to-nuclear transcriptional regulation, through β2-adrenergic receptor (β2-AR) signaling. Moreover, we show that reconsolidation requires both β2-AR signaling and CRTC1 in an anatomically and genetically defined amygdala cell population which is also important for memory encoding. These results reveal a circuit-to-molecular mechanism for reconsolidation, suggesting a neural substrate for control of memory strength during recall.

Biography:
In my graduate training in Prof Soong Tuck Wah's lab in NUS, I embarked on the characterization of voltage-gated calcium channels expressed in postsynaptic neurons and its regulation on electrical excitability. Pavlovian fear conditioning is the preeminent paradigm for studying questions of learning and memory, and emotion. This sparked my interest in the study of circuit and molecular mechanisms by which aversive experiences lead to learned changes in emotional behaviors for my postdoctoral training in the Joshua Johansen lab in RIKEN Center for Brain Science., which was funded by two consecutive fellowships, one by the Japanese government and one by RIKEN. During my time here, I found that anatomically distinct amygdala and mPFC projecting subpopulations from the brainstem LC have different functions in aversive or safety memory formation, and in my current seminar, I will present unpublished work on how these noradrenergic projections direct molecular signaling in the amygdala subpopulations that store these memories.