THE CHINESE UNIVERSITY OF HONG KONG

SCHOOL OF LIFE SCIENCES

# LIFE SCIENCES SEMINAR SERIES
# 2014 – 2015

## Joint Seminar

# Novel Pituitary Actions of TAC3 Gene Products in Fish Model

*by*

Professor Anderson O.L. Wong
School of Biological Sciences
The University of Hong Kong

*on*

9 April 2015
(Thursday)

*at*

12:30 – 1:15 pm

*at*

L2, Science Centre
The Chinese University of Hong Kong

*ALL ARE WELCOME*

**Novel Pituitary Actions of TAC3 Gene Products in Fish Model.**

Anderson O. L. Wong, School of Biological Sciences, University of Hong Kong

TAC3 is a member of tachykinins and its gene product neurokinin B (NKB) has recently emerged as a key regulator for luteinizing hormone (LH) through modulation of kisspeptin/ GnRH system within the hypothalamus. In fish models, TAC3 not only encodes NKB but also a novel tachykinin-like peptide called NKB-related peptide (NKBRP) and the pituitary actions of these TAC3 gene products are still unclear. Using grass carp as a animal model, the direct effects and post-receptor signaling for the two TAC3 products were examined at the pituitary level. Grass carp TAC3 was cloned and confirmed to encode NKB and NKBRP similar that of other fish species. In primary culture of grass carp pituitary cells, NKB and NKBRP treatment did not affect LH release and gene expression but up-regulated prolactin (PRL) and somatolactin α (SLα) secretion, protein production and transcript expression. The stimulatory effects of the two TAC3 end products on PRL and SLα release and mRNA levels were mediated by pituitary NK2 and NK3 receptors, respectively. Apparently, NKB- and NKBRP- induced SLα secretion and transcript expression were caused by activation of AC/cAMP/PKA, PLC/IP3/PKC and $Ca^{2+}$/CaM/CaMK-II cascades. The signal transduction mechanisms for the corresponding effects on PRL release and gene expression were also similar, except that PKC component was not involved. These findings suggest that the two TAC3 gene products do not play a role in LH regulation at the pituitary level in carp species but may serve as novel stimulators for PRL and SLα synthesis and secretion via overlapping post-receptor signaling mechanisms coupled to NK2 and NK3 receptors, respectively.