In crustacean, crustacean hyperglycemic hormone (CHH) is involved in the control of important physiological process such as the sugar metabolism, molting and reproduction. Molt-inhibiting hormone (MIH) controls molting by inhibit the synthesis and secretion of ecdysteroid or molting hormone. Both hormones are produced and secreted from X-organ sinus gland complex in the eyestalk optic lobe. It has been reported that CHH/MIH peptides are expressed within the same cell in the optic lobe of some species. Therefore, the purpose of this study is to localize CHH/MIH in the optic lobe of the black tiger shrimp, Penaeus monodon. Eyestalk of P. monodon (20g BW) were fixed in Davidson’s fixative, dehydrated and embedded in paraffin. Polyclonal antibodies against CHH and MIH were used as the primary antibodies, and FITC-conjugated goat anti-rabbit/mouse IgG was used as the secondary antibody for immunofluorescent staining and sections of the optic lobe were examined under laser-scanning confocal microscope. The results revealed that numerous neurosecretory cells in the medulla terminalis of the optic lobe contained CHH and few cells contained MIH. Some contained both CHH and MIH, but some contained neither one of the two hormones, which are undistinguishable by morphological criteria, but clearly distinguishable by specific antibodies. The sinus gland and the axonal tract of the eyestalk also contained both CHH and MIH. Therefore CHH/MIH co-localization may exist, though not always being the case, in this economic penaeid shrimp.

Acknowledgement: This study was funded by the Centex Shrimp, Mahidol University, Rangsit University and by the NSTDA, Ministry of Science and Technology of Thailand.
Fig. 1: Photomicrograph by laser-scanning confocal microscope showing immunofluorescence of MIH (green) and CHH (red) in the X-organ (XO) (A) and co-localization of MIH and CHH (orange) in sinus gland (B) of the Penaeus monodon optic lobe.

Fig. 2: Photomicrograph by laser-scanning confocal microscope showing immunofluorescence of MIH (green) (A), CHH (red) (B), and co-localization of MIH and CHH (orange) (D) in the X-organ of the Penaeus monodon optic lobe. In negative control (without antibody) sections, no fluorescence signal were observed (C).