Thesis Title Membrane-bound Adenylate Cyclase from Ovarian Tissue of Giant Freshwater Prawn, *Macrobrachium rosenbergii* (de MAN)

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ABSTRACT

Specific sandwich ELISA was developed for quantitative measurement of vitellogenin, the precursor of egg-yolk protein, in *M. rosenbergii*. Circulating vitellogenin in the prawn hemolymph was monitored during reproductive cycle and found to be optimally elevated prior to complete ovarian maturation and spawning. The correlation between circulating vitellogenin profile and ovarian maturation was similarly observed in the eyestalk ablated female prawn whose reproductive cycle was stimulated to be significantly shorter than normal prawn. Investigations of certain steroids involving in crustacean reproduction including progesterone, 17α-hydroxyprogesterone and estrogen either by direct measurement in the hemolymph or by administration of exogenous steroid showed no correlation with vitellogenin level and ovarian maturation. The results implied that the 3 steroids might not be involved in regulating in ovarian development in *M. rosenbergii*.

Adenylate cyclase activity was detected in ovarian membrane fraction by following the formation of radioactive cAMP from α^{32}P ATP. Partial characterization indicated the enzyme was the NaF sensitive ovarian membrane adenylate cyclase. Furthermore, adenylate cyclase was also detected in hepatopancreas membrane fraction and found to be NaF insensitive. This findings established the first report on the existence of adenylate cyclases in both ovarian and hepatopancreas tissues of crustacean thereby leading to the suggestion that the enzymes may involve in the membrane signalling process of the hormones targeting on the ovary and hepatopancreas respectively. The findings also provided possible development of the *in vitro* bioassay for adenylate cyclase dependent hormones targeting on either ovary or hepatopancreas of *M. rosenbergii.*