D-29 The Expression of cAMP-dependent Protein Kinase Catalytic Subunit Gene (DC0) is Induced by Mating in *Drosophila* Male Reproductive Organs.

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Drosophila cAMP-dependent protein kinase (PKA) involved in many physiological processes ranging from oogenesis and early embryogenesis to learning and memory formation in adults. *Drosophila* PKA is composed of two regulatory subunits and two catalytic subunits like mammalian PKA. The catalytic subunit gene of *Drosophila* PKA has been found 3 types, DC0, DC1, DC2, however, DC0 is the major *Drosophila* PKA catalytic subunit gene. It has been reported that DC0 gene is expressed in head of adults, wingbud of pupa and early embryo.

In the present study, we found the expression of DC0 in male reproductive organs of adult using P-element-mediated enhancer detection line. The expression of DC0 in the male reproductive organs increased for 3-4 days after eclosion and reduced slowly until 10 days after eclosion since then. And DC0 gene expression in male reproductive organs induced by mating in 10-day-old virgin male. Some other studies about mating-induced gene expression showed that DC0 gene expression in male reproductive organs maintained from 30 min to 24 hr after mating. The level of gene expression after two and three times serial mating was higher than that of gene expression after once. The treatments of juvenile hormone, forskolin and phorbol ester also increased gene expression of DC0. These results imply that PKA-mediated signal transduction is regulated not only in the level of protein activity but also in the level of gene expression. The physiological changes by induction of PKA might affect to cellular processes, exocytosis and mitosis. Further study about the function of PKA in *Drosophila* male reproductive organs is being carried out now.

D-30 Identification of Alternatively Spliced Na^+-Ca^{2+} Exchanger Isoforms Expressed in Mouse Heart

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The Na^+-Ca^{2+} exchanger plays an important role in the regulation of intracellular Ca^{2+} concentration in cardiac muscles. The mouse cardiac Na^+-Ca^{2+} exchanger cloned by us predicted a 970 amino acid polypeptide with a putative leader peptide and 11 putative transmembrane regions. The mouse cardiac exchanger is highly identical to other cardiac exchangers. Although the tissue-specific alternative splicing in the variation region of cytoplasmic loop has been reported, there has been no report about the presence of alternative splicing in heart. We identified four Na^+-Ca^{2+} exchanger isoforms expressed in heart by RT-PCR with mouse heart tissues. Southern blot analysis suggests that the cardiac Na^+-Ca^{2+} exchanger gene exists as a single copy in the mouse genome. These results confirmed that these isoforms identified in mouse heart are the alternatively spliced products. There is no regional differences of alternative splicing between atrium and ventricle because the size and the relative abundance of each isoform is almost similar between atrium and ventricle. Alternatively the pattern of alternative splicing is similar both at embryonic stage and adulthood.