



WAKATE INITIATIVE SEMINAR

演題： IDENTIFICATION OF GENES AND PATHWAYS REQUIRED FOR GURKEN SIGNALLING IN THE DROSOPHILA OVARY.

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U. S. A. (LABORATORY OF JAMES SKEATH).

日時： 2010年10月12日(かよび) 4:00 – 5:00pm

会場： 医学系学系棟 272 (Igaku-kei-gakukeitou room 272)

要旨： Dorsoventral patterning in egg chambers is established by Grk synthesis in the oocyte and its secretion to adjacent follicle cells where it acts as a dorsalization signal by activating the MAPK pathway. *Bicaudal C* and *trailer hitch* are both required for dorsoventral patterning of the *Drosophila* oocyte as mutations in these genes cause the production of dorsalized eggs. We show that *Bicaudal C* and *trailer hitch* interact genetically. Mutants of these two genes have shared defects in localization of *gurken* and other anteriorly-localized mRNAs, as well as altered microtubule organization which may underlie the mRNA localization defects. *Bicaudal C* and *trailer hitch* mutants also share a syndrome of actin-related abnormalities, including the formation of ectopic actin cages near the anterior of the oocyte. The cages sequester Gurken protein, blocking its secretion and thus interfering with signaling of the follicle cells to specify dorsal fate. In a separate study we have focused on the events downstream of Grk signaling by searching for proteins phosphorylated by MAPK in follicle cells. Several new *C. elegans* MAPK substrates were identified by our collaborator and we found that their *Drosophila* homologs are phosphorylated in discrete ovarian regions. The phosphorylation of two of these proteins is dependent on Grk signaling and we are determining the impact of these phosphorylation events on ovarian development.

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Reich J, Snee MJ and Macdonald PM. (2009) miRNA-dependent translational repression in the *Drosophila* ovary. *PLoS One*, 4: e4669.

Snee MJ and Macdonald PM. (2009) Dynamic organization and plasticity of sponge bodies. *Developmental Dynamics*, 238: 918-930.

Snee MJ, and Macdonald, PM. (2009) BicaudalC and Trailer hitch have similar roles in *gurken* mRNA localization and cytoskeletal organization. *Developmental Biology*, 328: 434-444.

Snee MJ, Benz D, Jen J, and Macdonald PM. (2008) Two distinct domains of Bruno bind specifically to the oskar mRNA. *RNA Biology*, 5: 1-9.

Snee MJ, Harrison D, Yan N, and Macdonald PM. (2007) A late phase of Oskar accumulation is crucial for posterior patterning of the *Drosophila* embryo, and is blocked by ectopic expression of Bruno. *Differentiation*, 75: 246-255.

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