SPATIALLY RESTRICTED PATTERN OF THE MITOSIS IS INVOLVED IN THE SENSORY MOTHER CELL FORMATION OF THE WING DISC IN *DROSOPHILA*.

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Large bristles, sensory organs, on the *Drosophla* adult notum are arranged in a precise and reproducible pattern. This pattern is formed as spatial and temporal restricted appearance of the sensory mother cells (SMCs) for the bristles.

To understand the relation between the formation of SMCs and the mitotic acitivity of the surrounding cells, we examined the spatial and temporal mitotic pattern of the wing discs with attention to the place and time which SMCs appear. We applied double staining method using BrdU immuno labelling to detect the mitotic activity and enhancer-trap transformant line, A101, to mark the SMC appearance.

Spatial distribution of mitotic activity of the disc cells was not uniform in the notum region. We found the locally restricted area of mitotically quiescent cluster of cells (MQC) in the notum. X-gal and BrdU double staining revealed that these MQCs were located around the SMCs. Moreover, MQCs were also observed where SMC will appear later and MQC appeared sequencially like SMC appearance.

These results suggest that temporally arrested cell cycle is involved in the formation and positioning of the SMC.

THE MAINTENANCE OF CONSTANT NERVE RING IN HYDRA

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The anatomy and dynamics of the nerve ring in hypostome of *Hydra oligactis* were examined immunocytochemically using an antiserum against a neuropeptide and neuron-specific monoclonal antibodies. The nerve ring is unique in the mesh-like nerve net in hydra since it is a distinct neuronal complex consisting of a thick nerve bundle running circumferentially at the border between the hypostome and tentacle zone. Immunostaining showed that the nerve ring was heterogeneous and contained at least four different subsets of neurons.

During head-regeneration and budding the nerve ring appeared only after the nerve net of ganglion and sensory cells had formed. The ectoderm including the nerve ring constitutes a stationary zone that is not displaced. Tissue immediately above this zone is displaced towards the tip of the hypostome,while tissue below is displaced along the tentacles. Correspondingly the production of differentiation kinetics is much slower than in surrounding areas. Thus the nerve ring is static and stable in contrast to dynamic features of nerve net of hydra.

THE *DROSOPHILA POKKURI* GENE PREVENTS OVERPRODUCTION OF THE R7 PHOTORECEPTOR.

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By inserting single P elements into the fly genome, we have induced recessive mutations in a gene *pokkuri* (*pok*), which lead to overproduction of the R7 central photoreceptor with only minor effects on outer photoreceptors and the R8 cell. When one copy of pok^1 is introduced into the *sevenless* (*sev*) homozygous background, single R7-like cells are restored to all ommatidia, i,e., the sev^{LY3} phenotype is suppressed by pok^1 in a dominant manner. Two copies of pok^1 in the sev^{LY3} homozygotes produce a variable number of R7-like cells, the phenotype of which is indistinguishable from that of sev^+; pok^1. We have studied the phototactic behaviour of the sev^{LY3}; pok^1 double mutant, using a T maze system. When given a choice between UV light and green light, normal flies select UV light, whereas sev^{LY3} homozygotes opt for green light. Flies homozygous for sev^{LY3} and pok^1 prefer UV light over green light. Thus pok^1 reverses the colour choice behaviour of sev^{LY3} flies, demonstrating that at least some of the R7 cells are functional and make correct connections with central neurones. Mosaic analysis has shown that the *pok* wild type function is required in R1 and R6 cells to repress induction of supernumerary R7 cells, implying an additional regulatory pathway for the induction of R7. We propose a hypothesis, where the *sev* system is postulated to convey a signal used to dis-inhibit *pok*-mediated repression in the R7 precursor, thus allowing it to take on the R7 fate. Since other *sev* expressing cells would have no contact with R8, the Sev tyrosine kinase of these cells would never be activated by its ligand, Boss protein. As a consequence, only the R7 precursor could assume the R7 fate.

EARLY DEVELOPMENT AND MIGRATION OF CRANIAL AND TRUNK NEURAL CREST CELLS IN THE TURTLE EMBRYOS.

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The neural crest is an embryonic tissue that differentiates into various cell types including pigment cells. We report here development of cranial and trunk neural crest and routes of migration of HNK-1-immunoreactive cells in embryos of the turtle (Trionxy sinensis japonicas). It was found the presence of two major routes of migration in the trunk: (1) a dorsolateral pathway between the somite and the ectoderm; (2) a ventral pathway between the anterior dermomyotome and the sclerotome; crest cells were also found adjacent to a region of the posterior somite. It seems that a ventrally migrating neural crest cells pass through the somite is the source of melanocyte in some extracutaneous tissues. The results suggest that the neural crest cells may have similar mode of migration in development of amniotes.