DB 161

MIGRATION AND DIFFERENTIATION OF NEURAL CREST CELLS TO PIGMENT CELLS IN CHICK EMBRYO.

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The factors govern the migration and differentiation of neural creast cells into pigment cells have been studied by the immunohistochemical method and the cultur of neural creast cells. At the initial migration stage of neural crest cells, tenasein and fibronectin were uniformly distributed in somites. At the later migratory stage, the distribution of fibronection did not change, but the localized distribution of tenascin in the ventral migratory pathway of neural crest cells was observed. It was found that many of differentiating cells into pigment cells were lately derived from the neural creast and the number of differentiating cells into pigment cells have increased as the retardation of cell migration from the neural creast by the treatment of cytochalacin D.

These results suggest that the determination for the pigment cell may be depend on the retention period of cells in the neural creast and the distribution of extracellular matrix in cell migration pathways.

DB 162

DEVELOPMENTAL INTERACTION IN THE PIGMENTARY SYSTEM OF THE MOUSE TAIL TIP. EFFECTS OF COAT COLOR GENES ON THE EXPRESSION OF TAIL-SPOTTING GENE.

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The tails of agouti C3H/HeJmsHir mice are completely pigmented, whereas those of black C57BL/10JHir animals possess unpigmented tips. Genetic analysis indicates that white tail-tipping is due to an autosomal recessive, with incomplete penetrance, that segregates independently from agouti with a maternal influence in the F_1 generation. To analyze the influence of specific coat color genes on the expression of tail-spotting in mice, five congenic lines of C57BL/10JHir with different coat colors were prepared. No influence was observed on the occurrence of tail-spotting in agouti (A/A), dilute (d/d), F_1 between black and albino (c/c), and F_1 between black and pink-eyed dilution (p/p). However, the frequency of tail-spotting was dramatically decreased in brown (b/b) mice. These results suggest that the mutant allele (b) at the brown locus is involved in determining extent of pigment areas in the tail tips of mice through an interaction with the tail-spotting gene.

DB 163

TEMPORAL CHANGES IN AGGREGATIVE ABILITY OF CHICK LIMB BUD DISTAL CELLS.

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We assumed that proximo-distal pattern specification in the chick limb bud may be caused by the change in the ability of aggregate formation in the cells of progress zone(PZ). So we examined the developmental change of aggregative ability in PZ cells,using chick-quail chimeras.

When stage 20 PZ cells and stage 25 PZ cells were mixed and cultured,stage 20 cells preferentially aggregated and formed nodule-like structures,although stage 25 cells occupied the internodule spaces.

Next,the PZ cells at each stage were mixed, reaggregated centrifugecally, jacketed in the ectodermal hull,and grown on a host limb bud. Stage 20 cells could form proximal cartilage structures,but stage 25 cells could not form the proximal structures,instead they formed distal cartilage structures with the younger cells.

These result suggest that the aggregative ability of PZ cells is high at early stages and is lost gradually at later stages,and this gradual change may relate to pattern specification along the proximo-distal axis.

DB 164

THE ANALYSIS OF THE POSITIONAL VALUE OF THE LIMB BUD ALONG THE ANTERO-POSTERIOR AXIS WITH CHICK-QUAIL CHIMERA

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To elucidate the difference in positional value-related property of the progress zone along the antero-posterior axis, quail wing bud fragments of the progress zone were grafted into the different site along the antero-posterior axis. Developed chimera wing was examined immunohistochemically with A223 antibody. Moreover the cell lineage of the wing bud mesoderm was traced by the analysis of chimeric wing bud. When the presumptive digit3 region of stage20 wing bud was transplanted into the presumptive digit2 or digit4 region, it formed the skeletal structures which corresponds to the position in the host wing bud. When the same transplantation was performed at stage25, the grafted presumptive digit3 region did not form the position-related host skeletal structures. These results suggest that the positional values along antero-posterior axis are not yet fixed at stage20. At stage25 the values fixed almost completely.

Comparing the cell lineage of the mesoderm with the expression pattern of AV-1, the AV-1 distribution at stage19 to 24 corresponds roughly to the tissue proliferation pattern, that is, the cell population which can express the AV-1 antigen is already specified at stage19-20.