CDB SEMINAR

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Friday, October 31, 2008
16:00~17:00 C6F Seminar Room

Nuclear regulation during newt lens regeneration

To understand the impressive regenerative abilities of urodele amphibia, our research has focused on nuclear regulation during regeneration of the newt lens. Two different histone regulations have been examined.

1. **Linker histone replacement from somatic to oocyte-type during newt lens trans differentiation**

   During newt lens regeneration, dorsal iris pigmented epithelial cells (PECs) dedifferentiate and subsequently differentiate into lens cells.

   Therefore, during this process of transdifferentiation adult PECs should be reprogrammed to gain the multiptentiality to differentiate into other types of cells.

   In animal cloning, mediated by somatic nuclear transfer into an enucleated oocyte, there is reprogramming of the somatic nucleus. The somatic linker histone H1 is replaced by oocyte-type linker histone B4 immediately after nuclear transfer.

   We have shown that B4 is expressed during lens transdifferentiation and the ratio of B4 to H1 is increased to about 14 times by 12 days after lentectomy. This indicates that reprogramming of adult somatic newt cells shares similar strategy with the nuclear transfer-mediated reprogramming in oocytes. It has been succeeded to knock down of B4 during lens regeneration via Morpholino treatment and functional analysis of B4 is ongoing.

2. **Inhibition of lens formation from ventral iris**

   As it was stated above, lens regeneration occurs only from the dorsal iris pigmented epithelial cells, but never from the ventral iris PECs. By examining for various histone modifications during lens regeneration, it was found that TriMeH3K27 was not changed in dorsal iris PECs but increased in ventral PECs. Furthermore, knockdown of Ezh2, a methyltransferase against H3K27, induced lens formation from ventral iris. This suggests that global gene suppression in the ventral iris might inhibit regeneration from that site.

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