DB 39

OFFSPRING FROM FETAL OVARIES GRAFTED IN MICE STERILIZED BY X-IRRADIATION.

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In order to manipulate fetal ovaries which contain oocytes in the meiotic prophase and obtain offspring from these ovaries, we examined fertility of the mice sterilized by X-irradiation and then grafted 13.5-19.5 dpc fetal ovaries orthotopically. In 129/Sv-Ay and -S1CP strain mice, fetuses from (Ay/+ x Ay/+) and (S1/+ x S1/+) matings were used as donors and adult females(+/+) as hosts. Hosts were exposed to 100 rad whole body X-irradiation and grafted fetal ovaries in various intervals. Histological examination of host ovaries 56 days after irradiation showed almost elimination of oocytes. Eighty percent of hosts given grafts 28 days after irradiation and mated with males 4 weeks later produced offspring derived from grafts, whereas 4 % of not X-irradiated hosts did so. It is concluded that sterilization by X-irradiation is more useful for obtaining offspring from small fetal ovarian grafts than ovariectomy. Supported by the Special Coordinating Funds for Promoting Science and Technology and a Grant-in-Aid from the Ministry of Education, Science and Culture.

DB 40

OFFSPRING OBTAINED FROM TRANSPLANTATION OF FOETAL MOUSE OVARIES.

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We are trying to develop a new method of introducing foreign genes into mice through manipulation of the primordial germ cells (PGCs). Noguchi and Noguchi (1982) reported that adult female mice transplanted with 13.5-19.5 dpc foetal ovaries bore offspring derived from the transplants. Now, we examined whether similar transplantation can be successfully carried out with 12.5 dpc foetal ovaries which contain proliferating PGCs before entering into meiosis.

C57BL/6-bg/bg (beige mice) foetuses were used as donors and adult C57BL/6 females as hosts. Two weeks after the transplantation, hosts were mated with beige mice. Of 18 host females carrying ovaries not cultured, one was delivered of beige mice. Two of 7 hosts which were transplanted with ovaries cultured for 2 days bore beige mice, and one of 8 hosts carrying 3 day-cultured ovaries did so. These results suggest a novel possibility of using PGCs for genetic manipulation of the germ line.

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DB 41

REGENERATION OF THE TUNIC CUTICLE IN A COMPOUND ASCIDIAN, BOTRYLLOIDES SIMODENSIS.

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The regeneration processes of tunic cuticle were studied by using transmission electron microscopy. After cutting off a part of tunic from a colony, the colony was kept in sea water (SW). Within a few hours, electron dense filaments appeared at the cut surface of the tunic. The filaments aggregated to form a continuous cuticle layer, and fully covered the tunic matrix at the cut surface. After 3-5 days, minute protrusions were formed on the outer surface of the regenerated cuticle. At this time, there were no differences between regenerated and normal cuticles. The processes of cuticle regeneration were very similar to those of the new tunic wall formation in the allogeneic rejection reaction of colony specificity.

The filament formation was observed at the cut surfaces of tunic fragments without zooid, after incubation in SW. The formation also occurred in tunic fragments incubated in NaCl-HEPES (pH 8) which was isotonic to sea water, but was inhibited partially or completely in specimens exposed to some experimental conditions, such as incubation in low pH SW or SW containing EDTA, treatment with DW, detergent, glutaraldehyde or KCN, and freezing and thawing.

DB 42

REGENERATION OF THE NEURAL COMPLEX IN THE COMPOUND ASCIDIAN, POLYANDROCARPA MISAKIENSIS.

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Fully developed neural complex of ascidians consists of two different parts, the cerebral ganglion and the neural gland with two ducts which run forward and afterward from the gland. In the compound ascidian, Polyandrocarpa misakiensis, both the zooid from which the neural complex has been removed and the fragment without neural complex have a capacity to regenerate it. Histological study revealed that the ciliated funnel, the opening of neural gland duct, and neural gland duct appeared at first during the regeneration of neural complex. The cerebral ganglion appeared thereafter in the mesenchymal space. It seems likely that the neural gland duct is derived from the atrial epithelium. On the other hand, the cerebral ganglion seems to be formed by the blood cells. Regeneration of the cerebral ganglion from the fragment without neural complex was late compared to that from the neural complex removed zooid.