91. *Studies on the Cultures of the Mammalian Spinal Cord*

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Fetal spinal cord of rats and mice were cultivated on the collagen coated coverslip and maintained with Maximow's double coverslip method. Feeding medium was composed of equal parts of Gey's balanced salt solution, bovine serum ultrafiltrate, horse serum and extract of 9-day-old chick embryo. Glucose was added to the medium so as to produce 600 mg per cent in final concentration.

In early stage of cultivation, outgrowth is classified into two types, Schwannian and glial. The former is most prominent at the ventral and dorsal roots, whereas the latter is widespread around the explant. Neuritic outgrowth can be seen in both types of outgrowth. With young fetal spinal cord, less than 15 days in Utero, migration of nerve cells can be seen. This usually occurs along the dorsal Schwannian outgrowth. After cell proliferation, which is most marked for the first 7-10 days, cell differentiation took place. Myelination can be seen after 10 days in vitro. There are two types of myelination, one is associated with Schwann cells, another is involved with oligodendroglia cells. When leptomeninx is removed at explantation, no Schwannian outgrowth is obtained. And only central type of myelin sheath is formed. Among the neuron somas, motor neuron is more difficult to maintain in vitro than those of sensory.

92. *In vitro and in vivo Effects of Nerve Growth Factor (NGF) and F-fraction extracted from Bovine Submaxillary Gland*

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The purpose of the present study was to the observation on the functional correlates of 2 kinds of protein (NGF and F-fraction) purified from bovine submaxillary gland.

Both purified factor are non-conjugated protein and non detection of sugar was confirmed.

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NGF showed the specific activity on the outgrowth of axon cultivated from sensory ganglia of chick embryo and newborn rat. On the contrary, F-fraction was effective somewhat on above culture, but accelerated remarkably on glia elements in vitro.

1 MLD of tetanus toxin (strain Harvard) injected in 16 mice subcutaneously was all paralysed after 24 hrs, 1 mouse died after 3 days and all passed away within 1 week. Simultaneously administrated NGF 0.07 mg/g with 1 MLD of tetanus toxin was died 2 mice after 1 week, and was survived 14 mice after 2 weeks. Simultaneously treated F-fraction with toxin was all survived during 2 weeks. And more, F-fraction treatment more decreased neurological symptoms (paralysis, convulsion and hypertony) than NGF treatments. Paralysis becoming on 24 hrs after 1 MLD toxin was affected by the treatments of NGF and F-fraction after that time. Recovery rate of NGF was 45.5% and its F-fraction was 81.25%.

These results supports the assumption that F-fraction, probably glia stimulating factor, is likely to be performing a significant role in promoting nerve function in situ similar to NGF.

93. Experimental Study of Transplantable Mouse Glioma induced by 20-Methylcholanthrene

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Two cases of transplantable C3H-mouse glioma induced by application of 20-methylcholanthrene were studied.

One (N-23) was primarily a glioblastoma which was characterized by pleomorphic spongiosoblast-astrocytic cells with a pallisading arrangement around the necrotic foci. The other (N-55) was diagnosed as a malignant astrocytoma or glioblastoma with less evidence of pleomorphism. As successive subcutaneous transplantations proceeded with both gliomas, the tumor cells transformed in shape or character, appearing as if the original tumors had definitely been changed.

In N-23, however, when the subcutaneous tumor cells were again transplanted into the brain, they regained the cytoplasmic processes resembling the astrocyte which had disappeared during the subcutaneous transplantations.

In N-55, the astrocyte-like cells were clearly observed when the tumor cells were cultivated in vitro. It was thus resumed that the tumor cells maintained the potentials of glial cells, even though they had remarkably different appearances during the successive transplantations.