

grams of  $^{32}\text{P}$  in the tissue, using this apparatus, were obtained. Next, microautoradiograph technique was applied to the cancerous tissues obtained from various sources such as the stomach, breast and intestine at

24 hours after  $^{32}\text{P}$  injection. The granules which indicate the presence of  $^{32}\text{P}$  in the tissue were localized in the cancerous and noncancerous cell, intercellular substance and blood vessel.

## Autoradiographic Studies on Cell Kinetics in von Recklinghausen's Disease

J. MAEKAWA, T. KITAMURA, K. NAKAJIMA, S. YOSHIDA,  
R. NISHIKAWA, O. TAKEOKA and S. FUJITA

*The Second Department of Pathology, Kyoto Prefecture  
University of Medicine, Kyoto*

M. TOYAMA and S. FUKUMA

*The First Department Surgery, Kyoto Prefecture University of Medicine, Kyoto*

We have been studying on cell kinetics in the human brain tumors by means of  $^3\text{H}$ -thymidine autoradiography. In the present paper we analysed cyto-kinetics of three cases of von Recklinghausen's disease by local cumulative labeling method. Histologically the cases 1 and 2 were neurofibromatosis and the case 3 was Schwannoma. We selected two or four nodules in the skin as the materials and injected  $^3\text{H}$ -thymidine (20  $\mu\text{Ci}$  every 12 hours) for two to eight days. After the extirpation, the tissues were fixed in 10% formalin and embedded in paraffin. The autoradiographs were prepared by dipping the sections into the liquid emulsion Sakura NR-M2. Labeling indices were counted in the places where the influence of the damage by the injection needle was negligible.

The labeling index was, in the three cases, initially very low and increased very slowly as the cumulative labeling proceeded. In the case 1, the labeling index was 0.4% at 2 hours, 4.7% at 3 days, 6.5% at 5 days and 10.8% at 8 days. In the case 2, the labeling index started at 4.8% after 2 days of the cumulative

labeling and reached 8.8% at 4 days. In the case 3, the initial labeling index was 2.8% and increased to 15.5% at 4 days. Plotting these measurements against time we determined its i.e. duration of DNA synthesis, to be 8~11 hours in the cases 1 and 2, and 19 hours in the case 3.

The cell turnover rate of the cases 1 and 2 was 1.5~2% per day and that of the case 3 3% per day. Accordingly there might be slight difference of cell number flowing into DNA synthetic stage per unit time between multiple Schwannoma and neurofibromatosis, although both types are included in the same diagnosis of von Recklinghausen's disease. Judging from such slow turnover rate, we suppose that the roughly estimated doubling time of these tumors should be very long, being 1~3 months. In the previous papers, we reported that the duration of DNA synthesis in normal cells in human body is 8~12 hours, and in cancers 18~47 hours. It is interesting to note that the proliferation pattern of von Recklinghausen's disease is between that of the normal tissue and of cancers.