

In the human gastric cancer, incorporation of the radioactive sulfate is, in general, poor. Mucocellular carcinoma shows low concentration of incorporated $^{35}\text{SO}_4$ in signet ring cells. The label is distributed diffusely in the cyto-

plasm unlike in the goblet cells in which the labels were, shortly after the labeling, concentrated in the supranuclear region of the cytoplasm.

The ^3H -Thymidine Autoradiographic Studies on the Human Stomach Epithelium (in vivo)

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The kinetics of human stomach epithelium was studied in vivo by the ^3H -Thymidine autoradiography using "local labeling method". 25 μC of ^3H -Thymidine was injected intramucosally into the pathologic region as well as the non-pathologic one. 30 minutes to 2 hours after the injection, specimens were taken out from these regions and embedded in Paraffin or Resin. Sections were examined autoradiographically. After 1 month of exposure, these sections were stained with H-E or PAS. The labeling indices in the non-pathologic areas, the margin of the stomach ulcers, the stomach polyp and the stomach cancers were about 40%, 40-60%, 35% and 20-25% respectively. In the well differentiated stomach cancer, such as a signet ring cell carcinoma, it was about 10%.

The cellular proliferation and the growth rate of tumors were analyzed on the metastases of two cases of gastric carcinoma. The ^3H -Thymidine (25 μCi) was injected into the metastatic tumors every 12 hours over the period of 6-10 days. By this cumulative labeling of ^3H -Thymidine, it was demonstrated that the generation time (tg) of these tumors was 12-12.3 days and the DNA synthesizing time (ts) was 24-32 hours. The calculation of increases in the volume of these tumors

indicated that the proliferation rate (v) was 0.056-0.058, and the growth rate (δ) was 0.012-0.038. Since a part of the proliferative cancer cells lose their proliferative activity due to the differentiation or necrosis, v larger than δ will be reasonably accepted. Therefore, in the surface spreading carcinoma, especially in the gastrointestinal tract, the growth rate is considered to be lower, for the cancer cells with the proliferative activity are pushed out, as the underlying cells increase in number. According to this point of view, one can easily understand the fact that the surface spreading early gastric cancer tends to be clinically unchanged in size for a long time. From these considerations, 3 growth patterns of the human cancer were suggested: The first pattern, $v \gg \delta$, such as a surface spreading carcinoma; The second pattern, $v \gg \delta$, such as a deeply spreading carcinoma in the parenchymal area, and; The third pattern, $v \gg \delta$, in which the tumor grows exponentially. It was concluded that ts of the human stomach cancer was twice or three times longer than that of the normal and that ts of the human stomach cancers was relatively constant, being 24-48 hours, in spite of the variety of histological patterns.