Color Image Analysis of Mucin Distribution in Intramucosal Signet-ring Cell Carcinoma

Hiroyuki SUGIHARA, Ryoji ITO and Setsuya FUJITA

Department of Pathology, Kyoto Prefectural University of Medicine, Kyoto

We have developed a color image analyzer for histochemical use. In our system, light microscopic image is transferred via 3-gun saticon color video camera to an analog/digital converter. The digitized image is stored in video-random-access-memory(RAM) of an intelligent terminal to be processed by various commands sent in BASIC from a microcomputer(PC-8001, NEC). The image can also be stored in RAM disk or floppy disk for future retrieval.

This system was applied to histological sections of intramucosal signet-ring cell carcinoma. The mucosa stained with PAS-Con A-HRP method was divided into 5 zones parallel to the surface. Normal mucous cells stained with PAS or deposited with DAB were changed in color different from that of signet-ring cells. The respective areas of mucin in each zone were measured serially and displayed as histograms. As a result, it becomes clear that the mucin distributed uniformly in intestinalized glands and biased to upper and lower layers in normal gastric glands. The mucin of signet-ring cells was distributed in the pattern similar to that of the concomitant normal or intestinalized glands.

DNA-RNA CYTOFLUOROMETRY OF BONE AND SOFT TISSUE TUMORS

Katsuyuki Kusuzaki, Hideyuki Takeshita, Masahiro Kamachi, Tsukasa Ashihara

Department of Pathology of Kyoto Prefectural University of medicine, Kyoto

Bone and soft tissue tumors are often composed of several histologically different mesenchymal cells or of undifferentiated cells of unknown tissue origin, so that the histopathological diagnosis involving the determination of their malignancy and prognosis may be sometimes very difficult.

We have attempted to apply DNA-RNA cytofluorometry based on acridine orange (AO) fluorescence staining to the quantitative analysis of tumor cell kinetics of bone and soft tissue. From the results obtained, it was found that most of the benign tumors consisted of many diploid G0-G1 cells, diploid maturative cells having high RNA content, and a few diploid DNA synthetic and G2 cells, while most of the aggressive malignant tumors consisted of many polyploid cells accompanying irregularity of cellular RNA content and of their many DNA synthetic cells showing active cell proliferation.

But some of the benign tumors (neurilemmomas, hemangiomas) showed low grade polyploidization without DNA synthetic cells. And in some moderately aggressive, malignant tumors (chordomas, giant cell tumors), polyploid cells were very few, while there were many diploid DNA synthetic cells.

Spectrophotometric study on 3β-HSD in ovary of rat fed on high fat diet, related with incidence of DMBA mammary tumor.

Takeru FUJII and Yasuo KISHINO

Department of Nutrition, School of Medicine, Tokushima University

Using spectrophotometric method, we investigated the changes of 3β-HSD activity in ovary when dietary fats as the promoter of mammary tumor was given to the rat treated with DMBA. Female, Wistar-Imamichi rats were fed on 30%fat diets(Corn oil(C), Saflower oil(S) and Olive oil(O)) during 120 days, respectively, after the first administration of DMBA. Mammary tumor of rats showed grade II type of adenocarcinoma. The assay of 3β-HSD activity came from same method reported in the 22nd general meeting, 1980. 3β-HSD activity tended to intensify in order of O$>$S$>$C, and was most intense in interstitial gland and corpola lutea. When pregnenolone was used as substrate, the enzyme activity of ovary of tumor-bearing rats elevated than that of DMBA-untreatment rats. When DHEA were used as substrate, the activity decreased. The concentration of plasma progesterone in tumor-bearing rats increased. These results suggest that, in the ovary of tumor-bearing rat fed on diet containing polyunsaturated fatty acids, the ability of progesterone production increased.

Reaction Kinetics of Nitroblue tetrazolium (NBT) Reduction

Kensuke CHIKAMORI, Shinsuke YAMASHITA*, Ken FUJIMORI and Masa-oki YAMADA

Department of Anatomy, School of Medicine, and *Department of Pharmaceutical Engineering, Faculty of Pharmaceutical Sciences, Tokushima University, Tokushima

The reaction kinetics of chemical and enzymic formations of half intermediate of NBT formazan (HF) was studied with new solvent, 50 vol% polyethylene glycol#300(PEG#300). This solvent enabled a kinetical study of reduction of NBT by NADPH and NADPH formed in enzymic reaction in vitro, because the reduction product of NBT was soluble in this solvent.

In both formations, HF was formed by a second-order reaction.

In addition, it was suggested that all of PMSH formed in the reaction of phenazine methosulfate(PMS) to NADPH were not consumed for the reduction of NBT and a part of that reacted with another component in the reaction system.