fluorescence microscopy showed that the absorbed rabbit antiserum, after incubation with various kinds of tissues, was bound to the cells of the six types of carcinomas and to the epidermis of the adult skin. It did not bind to the normal adult tissues.

These findings indicate that in man, too, carcinomas corresponding to all three germinal layers contain antigens which cross react with the antibodies against the components of embryonic tissues.

The immunofluorescence studies in the present experiments suggest that the immunologically cross reacting tissue in skin is the epidermal layer. In spite of the cross reactivity among the adult epidermis and the components of embryonic tissue and malignant neoplasms, the molecular species may be different. Recent work with mice[3] indicates that the embryonic antigens represent different molecular species from the antigens of the skin. The molecular weights of the embryonic antigens were within the range of 66,000 to 68,000, whereas the skin antigens had molecular weights of from 10,000 to 15,000.

The degree of similarity between the molecules of the embryonal and carcinoma antigens is not known from the present experiments. In mice the embryonic and tumour extracts have identical chromatographic profiles using 'Sephadex G-200' fractionation[3]. It can be presumed that the molecules of the embryonal and carcinoma antigens are identical and that the carcinoma cells are capable of producing the kinds of proteins which, during the normal cell differentiation, become repressed.

The presence of embryonic constituents in malignant neoplasms could be explained assuming that the tumour cells are derived from totipotent differentiated cells by de-repression of the genome, for example, by viruses, hormones, chemical carcinogens, and other agents.

J. V. KLAVINS
R. MESA-TEJADA
M. WEISS

Department of Pathology of the Long Island Jewish Medical Center, Queens Hospital Center Affiliation, New York

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In vitro and *in vivo* Sensitivity of Cultured Blood Lymphocytes to Radiation Induction of Chromosome Aberrations

DETERMINATION of the frequency of chromosome aberrations in cultured blood lymphocytes may provide a means of measuring ionizing radiation doses, at least after whole body exposure. Much work has been done with human blood irradiated *in vitro*[1,2], but before these results can be applied to radiation exposure *in vivo*, the difference between *in vitro* and *in vivo* exposure must be shown to be quantitatively negligible.

Rabbits were given whole body exposure to cobalt-60 gamma rays simultaneously with irradiation of a sample of blood removed immediately before and kept at 39° C. A second blood sample was taken after whole body irradiation, and the two samples were cultured in the same way as unirradiated control sample, using PHA in medium TCM 199 plus unsuckled newborn calf serum. Fixation times (from 40.5–48 h) were identical for all cultures from any one rabbit. The yields of dicentrics/cell from blood irradiated *in vitro* and *in vivo* are compared in Table 1.

Table 1 Irradiation Induced Chromosome Aberrations

Dose (rad)	Rabbit No.	% Dicentrics/cell *in vitro/in vivo*	No. of cells analysed *in vitro/in vivo*
289	1	94	215/37
	2	87	210/167
387	3	99	191/166
	4	113	99/181
512	5	85	125/54
	6	100	209/90
588	7	87	123/219
	8	98	116/215

The frequency of dicentrics/cell after *in vitro* irradiation averaged 5% less than the frequency in blood from the same individual irradiated *in vivo*. For the purposes of biological dosimetry such a difference is quantitatively negligible.

Similar observations have been made on blood from six human subjects receiving 30–50 rad whole body irradiation[3]. The ratio of dicentrics/cell *in vitro/in vivo* varied 10 times between different individuals presumably because the radiation doses and therefore the aberration yields were so low.

The *in vivo* dose in comparisons like these is close to, but not identical to, the *in vitro* dose and the precise value for dose to the blood lymphocytes of the rabbit in the post-irradiation blood sample is open to discussion. Full details of this and of the technique and results will be given elsewhere.

J. F. CLEMENGER
D. SCOTT*

MRC Radiobiology Unit, Harwell, Didcot, Berkshire

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*Present address: Christie Hospital and Holt Radium Institute, Paterson Laboratory, Withington, Manchester 20.

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Detection of Antigen-binding Cells by Combined Rosette Formation and Autoradiography

ANTIGEN-BINDING cells (ABC) are generally detected by autoradiography using radioiodinated soluble antigen[1] or by rosette formation using either a particulate antigen[2] or an erythrocyte or other particle coated with soluble antigen[3]. Whether the same cell is detected by these two techniques was unknown. Using a soluble antigen, chicken globulin (CG), we have now demonstrated that the ABC detected by these methods is not invariably the same, which suggests that there is a receptor density difference between the thymus-derived (T) and the non-thymus-derived (B) rosette forming cell (RFC).

Four-month-old CBA mice were immunized initially with intraperitoneal injections of alum-precipitated chicken globulin (CG) and boosted with fluid CG. The preparation of CG