recently been stressed (Fitzgerald, Clin. exp. Immunol., 1971, 8, 421). Twenty-one patients and the same number of age-matched controls were studied. Lymphocyte transformation was induced at seven concentrations of PHA and the response measured by the incorporation of \[^{14}C\]-thymidine. Using the data obtained, dose response curves were plotted for both the cancer and control patients. A statistically highly significant difference between the two groups emerged at three different concentrations. This was considered to reflect a depression in "T" lymphocyte function but it was not possible to say whether this was due to a deficiency in the cells themselves or due to a serum inhibitory factor.

INHIBITION OF CELL MEDIATED CYTOTOXICITY AGAINST HUMAN COLON CARCINOMATA BY PAPAIN-SOLUBLE TUMOR MEMBRANE EXTRACTS. M. J. Embleton and M. R. Price. Cancer Research Campaign Laboratories, University of Nottingham.

Studies were undertaken to determine whether soluble tumour antigen preparations can influence cytotoxicity against cultured colon carcinoma cells by lymphocytes from colon carcinoma patients.

Peripheral lymphocytes from 61% of tumour bearing or post-operative patients were cytotoxic for colon carcinoma cells compared with normal control lymphocytes, as assayed by their capacity to reduce the survival of target cells in microtitration plates. Papain-solubilized membrane extracts were prepared from pooled colon carcinomatca, normal colon and melanoma, and their effect on cell mediated cytotoxicity was measured by incubation with patients' and control lymphocytes before addition of the lymphocytes to target cells. Colon carcinoma extracts inhibited cytotoxicity but normal colon or melanoma extracts had no effect. The inhibition of lymphocyte reactivity by soluble antigen may have important implications regarding the possible modification of tumour-immune reactions in vivo by circulating tumour antigen.

BCG IMMUNOTHERAPY OF RAT SARCOMATA. R. W. Baldwin and M. V. Pimm. Cancer Research Campaign Laboratories, University of Nottingham.

Growth of immunogenic 3-methylcholanthrene induced rat sarcomata was suppressed if tumour cells were transplanted subcutaneously in admixture with as little as 10 \(\mu\)g of viable BCG. Animals rejecting sarcoma cell–BCG inocula were subsequently immune to challenge with the same tumour, indicating the involvement of host responses to tumour associated rejection antigens. Furthermore, rejection of mixed inocula suppressed growth of a simultaneous challenge of the same sarcoma at another site. This specific active immunotherapy was successful even if given after tumour challenge.

Pulmonary growth of intravenously transferred sarcoma cells was also controlled by this form of active immunotherapy. More effective control was obtained by intravenous administration of BCG alone, even if delayed up to 7 days after challenge, perhaps reflecting preferential pulmonary survival of BCG and direct contact with tumour cells at this site.

THE ROLE OF MACROPHAGES IN CLASSIC MAREK'S DISEASE. J. C. Campbell. Cancer Research Campaign Unit, Department of Veterinary Pathology, Bush House, Milton Bridge, Midlothian.

Marek's disease is a contagious lymphoproliferative condition of chickens caused by a herpesvirus Type B and exhibits neural and visceral forms. Cells involved are mainly lymphocytes and plasmacytes. Lesions may terminate as lymphomata.

Indirect and direct immunofluorescence of cryostat sections and serosal spreads show antigen mainly confined to histiocytes, though vascular endothelium and neurilemma are frequently positive and lymphoid foci occasionally so. Fresh buffy coat preparations show positively staining monocytes which metamorphose in culture to motile macrophages. Lymphocytes adhere to these, forming conspicuous immunofluorescent clusters. Intercellular bridging between macrophages leads to the formation of immunofluorescent-positive polykaryocytes. Lymphocytes containing macrophage-endo-
Intracranial injection of lymphocyte cultures containing transformed cells has produced cerebral lymphomata in chickens.

**DIAGNOSTIC AND PROGNOSTIC SIGNIFICANCE OF DELAYED HYPERSENSITIVITY SKIN TESTING IN PATIENTS WITH MALIGNANT NEOPLASIA.** P. M. Bolton, S. L. James, J. Davidson and L. E. Hughes. University Department of Surgery, Welsh National School of Medicine, Cardiff.

Impairment of delayed hypersensitivity is a feature of advanced malignancy. Eilber and Morton (Cancer, N.Y., 1970, 25, 362) studied the response to D.N.C.B. in cancer patients and concluded that an impaired response indicated a poor prognosis.

We have investigated Mantoux and D.N.C.B. responses in 112 patients with solitary breast lumps and in 54 patients with suspected gastric or colonic neoplasia. Results were assessed in relation to final diagnosis (benign or malignant), tumour staging and prognosis.

Patients with benign breast lumps were nearly always D.N.C.B. positive, while impaired responses occurred in 60% of patients with breast cancer and haematogenous dissemination. Conversion from negative to positive was associated with a good response to treatment, whereas persistent negativity implied a poor prognosis.

Patients with gastrointestinal malignancy exhibited impairment of D.N.C.B. and Mantoux tests compared with controls. Positive tests indicated a better prognosis.

Serial testing of delayed hypersensitivity correlates with the course of the disease in cancer patients.

Repeated i.p. inoculations of irradiated Harding-Passey melanoma cells (HPM) induced an immune protection of mice against living HPM graft. *In vitro*, spleen cells from immune animals were found to produce a strong growth inhibition of HPM. However, peritoneal macrophages taken 7 days after immunization were less inhibitory than controls. The spontaneous cytotoxicity of control macrophages was recovered by macrophages taken 31 days after immunization. An electron microscopy study of the macrophages showed lysosome overloading with melanin on Day 7 and an important clearing of lysosomes on Day 31.

Preliminary experiments showed that it was possible to neutralize the inherent cytotoxicity of normal peritoneal macrophages by feeding them with melanin in culture.

Explants and primary cultures of HPM were found to contain a consistent amount of macrophages filled with melanin. It is suggested that malignant melanocytes can neutralize macrophage cytotoxicity by overloading their lysosomes with melanin.

**CHANGES IN GROWTH AND ADHESION OF EHRLICH ASCITES TUMOUR CELLS COATED WITH TRYPsin INHIBITOR (SOYBEAN).** P. Whur, R. T. Robson and N. E. Payne. Cell Biology Unit, Marie Curie Memorial Foundation, Research Department, Oxted, Surrey.

We report an attempt to inhibit tumour growth using a non-agglutinating plant protein. Mice injected i.p. with tumour cells and subsequently with trypsin inhibitor showed a 92% reduction of recoverable cells compared with untreated controls after 8 days of tumour growth. No differences were detected in rates of DNA synthesis *in vitro*, but experiments *in vivo* indicated that treated cells grew slightly faster. Trypsin inhibitor, which binds to the cell surface, was non-toxic to the treated cells. Scanning EM micrographs showed that treated cells, unlike untreated cells, adhered to internal abdominal surfaces, and treated cells also showed increased agglutinability with concanavalin A *in vitro*. These findings are generally compatible with the possible existence of an intrinsic protease, which becomes inhibited in treated cells.

**GROWTH INHIBITORY EFFECT OF PERITONEAL MACROPHAGES ON HARDING PASSEY MELANOMA, ITS IMPAIRMENT BY MACROPHAGE LYSOSOME OVERLOADING.** F. J. Lejeune, E. Beaumont and Y. Garcia. Department of Surgery, Institut Jules-Bordet, Brussels.