The high reinduction rate may result from (1) avoidance of drug resistance, (2) early diagnosis of relapse or (3) positive effect of immunotherapy or a combination of these factors.

IMMUNE COMPETENCE IN COLON CANCER: RELATIONSHIP OF PRE-TREATMENT TESTS TO DIAGNOSIS AND TUMOUR STAGE. A. M. MANDER, P. M. BOLTON, R. H. WHITEHEAD, R. G. NEWCOMBE and L. E. HUGHES, Department of Surgery, Welsh National School of Medicine, Cardiff.

A spectrum of immunological tests was performed to assess cellular and humoral immunity in 40 patients with colon cancer. Controls had suspected cancer but proved to have benign disease.

The tests employed were measurements of peripheral white cell count, lymphocyte count, serum immunoglobulin levels, lymphocyte response to PHA, DNCB response, and the Montoux test. Results were correlated with diagnosis and tumour stage. The colon cancer patients had both absolute and relative lymphocytopaenia. Serum IgM and IgA levels were significantly raised in the cancer group and were highest in the patients with distant spread. No difference in lymphocyte response to PHA was observed. DNCB and Mantoux responses were markedly depressed in the cancer group even in patients with early cancer. Discrimination between benign and malignant conditions was not greatly improved by using the tests in combination.

HOST TUMOUR RELATIONSHIP IN STOMACH CANCER—CORRELATION OF HISTOLOGICAL CRITERIA WITH TESTS OF IMMUNE COMPETENCE. A. M. MANDER, C. A. MORGAN, E. W. OWEN, J. ZLOSNICK and L. E. HUGHES, Welsh National School of Medicine, Cardiff.

The current prospective study involves multifactorial computer analysis of 50 stomach cancer patients who have been assessed from two separate approaches: the first by preoperative estimation of host immune competence, measuring lymphocyte response to phytohaemagglutinin, peripheral lymphocyte count, serum immunoglobulin levels, Mantoux response and dinitrochlorobenzene skin testing, and the second approach by histological examination of tumour and lymph nodes for evidence of cellular and humoral immune response.

Correlation of the two sets of data with each other and with clinical tumour staging has given a broad view of host tumour interaction in stomach cancer. The results will allow an assessment of whether histological parameters of cellular and humoral immunity correlate with results obtained by immunosurveillance tests, and which of these is most relevant to the clinical outcome of the disease.

HUMORAL IMMUNITY IN HUMAN LUNG NEOPLASIA. M. DAWSON and M. MOORE, Paterson Laboratories, Manchester.

Sera from patients with carcinoma of the lung were examined for evidence of humoral immunity towards allogeneic lung carcinoma cells in short-term culture.

Microcytotoxicity assays were used to investigate: (a) complement dependent cytotoxicity; (b) serum mediated cellular cytotoxicity and (c) " blocking " activity of sera towards leucocytes obtained from patients with lung carcinoma.

The incidence of complement dependent cytotoxic antibody to the sera was low, only 3/18 (17%) sera giving positive reactions. A higher proportion 8/18 (44%) of the same sera were found to induce cellular cytotoxicity against lung carcinoma cells in leucocytes obtained from healthy donors, while " blocking " activity towards lung cancer patients' leucocytes was found in 10/18 (56%) sera. The latter phenomenon was not specific since 5/7 (71%) sera from patients with unrelated cancers also reduced the cytotoxicity of leucocytes from lung cancer patients for cultured lung carcinoma cells. The implications of these findings for the interpretation of *in vitro* cytotoxicity tests in the human allogeneic context are to be examined.

MACROPHAGE MIGRATION INHIBITION AND IMMUNOGLOBULIN PRODUCTION BY HODGKIN'S DISEASE (HD) BIOPSY SPECIMENS *IN VITRO*. D. B. JONES, S. V. PAYNE, J. L. SMITH, and D. H. WRIGHT, Department of Experimental Pathology, Southampton University.

Recent theories of the aetiology of HD have postulated immune reactivity to viral or thymic antigens as fundamental to the disease process (Kaplan, *Hodgkin's Disease*, Harvard University Press, 1972).

HD spleen tissue in short-term culture produces high levels of immunoglobulin G in comparison with control spleen cultures. Preliminary results suggest that this immunoglobulin binds to peripheral blood lymphocytes. In addition, supernatants from HD lymph node and spleen cultures inhibited the migration of guinea-pig peritoneal macrophages *in vitro* in 11 of 15 cases. Control supernatants from carcinomatosis and reactive lymph nodes and normal spleens inhibited significantly in only 1 of 16 cases.

The biological properties of this inhibitor parallel those described for lymphocyte derived Migration Inhibition Factor: MIF (David and David, 1972). Lymphokine production *in vitro* is compatible with elevated levels of immune reactivity in HD tissue.

ATTEMPTS TO CULTURE HUMAN TUMOURS *IN VITRO*. R. H. WHITEHEAD and L. E. HUGHES, Department of Surgery, Welsh National School of Medicine, Cardiff.

There is a need for tissue culture lines of human tumours for *in vitro* studies. Attempts have been made to establish such lines from 220 tumour specimens. Ninety-six specimens from breast carcinoma patients have been cultured. These comprised 64 tumour specimens and 32 pleural effusions from patients with advanced disease. No cell lines have been obtained from the tumour specimens although epithelial cells proliferated for at least one month in 19 of the 64; 24/32 pleural effusions proliferated and 13 of these yielded cell lines. The nature of the cell is in doubt because mesothelial cells grow very well under the culture conditions used.

Seven of 29 colonic carcinomata specimens and 7/8 ascitic fluids from patients with colon carcinoma have also grown for at least one month. Three cell lines have been obtained from ascitic fluids; however, the cells are considered to be mainly mesothelial in origin. Good growth has been obtained from 12/24 melanomata cultured and two cell lines have been established.

Although numerous supplements have been added to the basic McCoy's 5A medium, enhanced growth was obtained only after the addition of insulin and galactose.

PROTECTION AGAINST THE CYTOTOXIC AZIRIDINE CB1954 BY AN ARYLIMIDAZOLE WITH ANTI-INFLAMMATORY ACTIVITY. J. A. HICKMAN and D. H. MELZACK, Chester Beatty Research Institute London.

CB1954 (5-[1-aziridinyl]-2, 4-dinitrobenzamide) is a potent and selective cytotoxic compound for the Walker tumour (Cobb *et al.*, *Biochem. Pharmac.*, 1969, **18**, 1519). The cytotoxicity was protected against by purine nucleotides and the purine precursor AIC (4-amino-5-imidazolecarboxamide) (Connors and Melzack, *Int. J. Cancer*, 1971, **7**, 86) but CB1954 had no effect on *de novo* purine biosynthesis (Mandel *et al.*, *Cancer Res.*, 1974, **34**, 275). In the search for the mechanism of action of CB1954 this protection phenomenon has been studied further and the anti-inflammatory agent 2-phenyl AIC (Heyes and Ward, *Br. Appl.*, **41**, 261/70) has been found to be a potent protector which gives a dose reduction factor of 90 in an anti-tumour test of CB1954.

2-Phenyl-AIC inhibits prostaglandin synthesis, as do a number of non-steroidal anti-inflammatory agents such as indomethacin. However, since such agents gave no protection against CB1954, it is considered unlikely that the protection mechanism involves prostaglandin synthesis.

LEUCOCYTOTOXICITY IN MALIGNANT AND NON-MALIGNANT COLONIC DISEASES. B. M. VOSE, M. MOORE, P. F. SCHOFIELD and I. W. DYMOCK, Paterson Laboratories, Manchester, Park Hospital and University of South Manchester.

The cytotoxicity of peripheral blood leucocytes from healthy donors and from patients with disorders of the large bowel, including ulcerative colitis, colon carcinoma, Crohn's disease, irritable colon and diverticular disease for cells cultured from malignant, normal adult and foetal colonic tissues has been compared. Leucocytotoxicity was defined in this study as a statistically significant reduction of target cell survival in microplate wells treated with leucocyte preparations compared with the survival of cells in wells exposed to growth medium