PART 1 : ABSTRACTS OF MEMBERS' PAPERS

Monday 7 April

CELL MEDIATED IMMUNE REACTIONS AGAINST RAT TUMOUR CELLS DETECTED BY *IN VITRO* MICROCYTOTOXICITY ASSAYS. M. ZÖLLER, A. M. DICKINSON and M. J. EMBLETON, Cancer Research Campaign Laboratories, University of Nottingham.

Rats immune to one of 6 syngeneic tumours with individually distinct tumour associated rejection antigens, or rats bearing growing tumours were tested for cell mediated immunity to their own or other tumours in comparison with normal control rats using a microcytotoxicity assay. Lymph node cells (LNC) were tested at ratios of 2000, 1000, 500 and 250 per tumour target cell. In most cases LNC from immune rats were cytotoxic specifically for the immunizing tumour with little cross-reactivity at high LNC ratios, although specific cytotoxicity was diminished at low ratios. LNC from 3–16 day tumour bearers were completely cross-reactive at high ratios but showed some tumour specificity at low ratios. The cross-reactivity at high ratios disappeared later in tumour growth, at a stage where tumour-specific reactivity was still detectable. The results indicate that rats of different immune status may have lymphoid cells reactive against antigens with different specificities or other (nonspecific) effector cells at various ratios, and these findings are relevant to the recent controversy on the use of microcytotoxicity tests for detecting immune reactions against human tumours.

SEPARATION OF SUBPOPULATIONS OF RAT LYMPH NODE CELLS CYTOTOXIC FOR TUMOUR TARGET CELLS AND CAPABLE OF INHIBITING CYTOTOXICITY *IN VITRO*. R. C. REES and J. BRAY, Cancer Research Campaign Laboratories, University of Nottingham.

Chemically induced rat hepatomata and sarcomata cells express both a tumour specific and embryonic antigen at the cell surface. Cell mediated immune responses towards these antigens can be demonstrated in tumour immune and tumour bearer rats. In addition, multiparous pregnant rats show reactivity towards the embryonic component, and can be demonstrated by *in vitro* lymphocytoxicity tests. The nature of cytotoxic effector cells from rats sensitized against both antigen components has been studied by cell fractionation on nylon wool columns. Cytotoxicity towards tumour associated embryonic antigen(s) is associated with fractions enriched with Ig bearing lymphocytes, and is separable from the cellular response directed towards the tumour specific antigen.

Treatment of cytotoxic lymph node preparations with carbonyl iron removes cellular reactivity towards the embryonic but not tumour specific antigen. In addition, a subpopulation of mainly T lymphocytes, isolated from multiparous pregnant rats, has been isolated and shown to be capable of abrogating cytotoxicity towards tumour cell targets. Such cells may be important in relation to preventing tumour rejection *in vivo*, and the results are discussed in this context.

BIOCHEMICAL IDENTIFICATION OF A PROTEIN ASSOCIATED WITH RAT TUMOUR AND EMBRYO CELL MEMBRANES. M. R. PRICE, Cancer Research Campaign Laboratories, University of Nottingham and R. W. STODDART, Strangeways Laboratory, Cambridge.

Plasma membrane fractions from transplanted 4-dimethylaminoazobenzene induced rat hepatomata and spontaneously arising rat mammary carcinomata were isolated from tumour homogenates by sucrose density gradient centrifugation in a zonal rotor.

Membrane fractions were also prepared from normal tissues (liver, lung, kidney, spleen) as well as from rat embryos. These preparations were dissociated in the presence of non-ionic detergents and membrane proteins were analysed by isoelectric focusing in polyacrylamide gels. A unique protein component (pI $4{\cdot}00 \pm 0{\cdot}05$) was identified, this being common to all tumour membrane preparations and also to foetal membranes obtained at a specific stage of embryogenesis. It was not possible to demonstrate the presence of this component in any of the normal tissues examined. These findings are

discussed in relation to the occurrence and expression of cross-reacting embryonic antigens associated with the cell surface of these rat tumours.

B AND T CELLS IN CANINE LYMPHOSARCOMA. D. E. ONIONS, Department of Clinical Veterinary Medicine, University of Cambridge.

Canine multicentric lymphosarcoma is a common spontaneous neoplasm of dogs. Canine lymphoma cells, like normal canine lymphocytes, may be divided into two classes, T and B, based on the spontaneous rosette formation between canine T cells and human erythrocytes, and the presence of a receptor for (human) complement on the surface of B cells.

The presence of an Fc receptor on canine lymphocytes appears to be an unreliable marker for B cells as many complement receptor lymphocytes (EACL) lack a detectable Fc receptor for using a rosetting technique with antibody coated erythrocytes.

SCANNING ELECTRON MICROSCOPY OF K CELL ACTIVITY ON RED CELL MONOLAYERS. A. E. WILLIAMS, Western General Hospital, Edinburgh, J. R. INGLIS, W. J. Penhale, A. FARMER and W. J. IRVINE, Department of Therapeutics, University of Edinburgh.

K cell activity against syngeneic cells (De Landazuriet *et al.*, *Cell Immunol.* 1974, **14**, 193) and defects in K cell activity in cancer patients (Wisloff *et al.*, *Scand. J. Immunol.*, 1973, **2**, 325) have been demonstrated. However, the identity of the K cell is still uncertain and conflicting evidence supports B lymphocytes, monocytes, macrophages and other leucocytes.

We have used the SEM to examine the interaction between human leucocytes (separated in Ficoll–Triosil and pre-incubated on glass) and antibody coated sheep erythrocyte monolayers (Kennedy and Axelrad, *Immunology*, 1971, **20**, 253). Only a small proportion of the leucocyte suspension adhered to the monolayer and the non-adherent cells lacked antibody dependent cytotoxic activity. Three morphologically distinct cell types were associated with areas of lysis in the erythrocyte monolayer within 4 h and correlation with light microscopy suggested that they were macrophages, granulocytes and lymphoid cells. Surface changes in the erythrocytes during contact with K cells indicate that mechanical factors may be involved in cell lysis in this system.

THERAPY OF METHYL CHOLANTHRENE INDUCED CBA MOUSE TUMOURS WITH *CORYNEBACTERIUM PARVUM* AND IRRADIATED TUMOUR CELLS. R. BOMFORD, Department of Experimental Immunobiology, Wellcome Research Laboratories, Beckenham.

Mice were injected subcutaneously with 2×10^4 tumour cells and 2 days later given *C. parvum*, irradiated tumour cells, or both admixed, into the footpad. Tumour growth was unaffected by *C. parvum* or tumour cells alone, but was suppressed by appropriate mixtures. The conditions for successful therapy were: 1. sufficient tumour cells ($> 5 \times 10^4$); 2. sufficient, but not excessive, *C. parvum* (optimally between about 5 to 20 μg, increasing with the dose of tumour cells); 3. the same tumour cells in the tumour challenge and treatment mixture; other MCA tumour cells were ineffective; 4. mice with an intact T cell system; tumour growth was not suppressed in T cell depleted mice. The results suggest that the therapeutic effect depends on the potentiation by *C. parvum* of a T cell dependent component of the immune response to TSTAs.

ROLE OF IMMUNOCOMPETENCE IN LOCALIZED BCG SUPPRESSION OF TUMOUR GROWTH. M. V. PIMM and D. G. Hopper, Cancer Research Campaign Laboratories, University of Nottingham.

Admixture of BCG organisms with cells of syngeneically transplanted rat tumours prevents their development and this leads to immunologically specific rejection of tumour deposits at distant sites. Immunosuppression by whole body irradiation did not prevent suppression of growth from mixed BCG : tumour cell inocula but did abrogate the concomitant rejection of distant challenge inocula. Tumour suppression at the site of BCG was, however, prevented by macrophage depletion of the host by silica treatment. These observations suggest that local BCG suppression of tumour does not require lymphocyte mediated immune responses and probably depends on less specific macrophage