Use of Immunological Reagents Prepared in Animals to Characterise the Surface of Leukaemic Cells

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Two central questions emerged concerning the immune response to leukaemia cell surface antigens. One concerns the relationship of such antigens to those on the surface of normal cells: are antigenic markers shared in common with normal cells of the T cell, B cell, or myeloid series, and if so, do the overlaps provide valid clues to the target cell of the malignant transformation? And if not, do we have truly tumour specific antigens which can be utilised for monitoring disease progress, for instance, in the prediction of relapse? The second concerns the role of viruses in leukaemia; can immunological procedures detect glycoproteins of viral origin on the surface of human leukaemic cells?

The contributions of Billings, Graeves, Kadin and Reyes bore mainly on the first of these questions. Two rather different approaches, both using specific antibodies raised in foreign species, are being employed. One (Greaves, Brouet) uses whole cells as immunogen, and relies either on coating the immunogen with antibody or on extensive absorptions to get round the problem of contamination of the desired reagent with irrelevant antibody. The most remarkable achievement of reagents produced in this way is to have divided ALL into two diseases, the less common characterised by the presence of T cell markers, and the more common by the presence of a unique ALL specific antigen. The second approach (Billings, Reyes) is to produce reagents by immunising with purified or partially purified molecules. Thus, specific anti-immunoglobulins can be used to detect immunoglobulin on the surface of CLL cells. Antibodies to less well-defined surface molecules can be used to detect partially leukaemia-specific antigens, but cross reactions with B cells are also detected with these reagents. Both types of reagent can usefully be conjugated to electron-dense molecules, such as ferritin, thus permitting the distribution of surface antigen to be examined in the electron microscope.

As regards the second question concerning viral antigens, the best data came from murine leukaemia virus tumours in rats and mice (Herberman). These indicate that the host repsonse is directed exclusively at viral antigens. The precice target of the response has not been fully established; ubiquitous immunity to endogenous viruses complicates the issue, and the role of the virus polypeptide P30 on the cell surface remains controversial. The unique antigen detected by Greaves on ALL has so far eluded attempts to identify it as a viral product.