INTRODUCTION

It has been the dream of clinicians to be able to direct the therapy to a specific target organ or disease cell and produce a specific response. This response may vary from stimulation of cells in the endocrine system to cell death in cancer cells. Until the 1970s the only weapons available for this were chemical based on pharmaceuticals. These tended to have a systemic effect, for example Mustine kills cancer cells but is only slightly less toxic to normal cells. The discovery of antibodies and of their unique property of recognising a specific receptor molecule has brought with it the hope that it might be possible to deliver a drug or radioisotope to specific cell type whilst other cells would remain untouched. Hence the idea of a magic bullet guided to a specific receptor on a specific cell by the specific binding sites which will bind only with its expected target.
THE ROLE OF NUCLEAR MEDICINE

Nuclear Medicine has been at the forefront of the clinical application of biotechnology advances into patient care. Nuclear Medicine is the study of the use of radioisotopes in the diagnosis and therapy of disease. It provides unique functional information not available with radiology. If the correct isotope is used the progress of a labelled substance can be easily followed non-invasively using a gamma camera. Therefore Nuclear Medicine is an essential partner in turning the products of biotechnology into clinically useful substances. The aim of this report is to review the progress in developing disease specific agents for diagnosis and therapy from standpoint of the Nuclear Physician.

POLYCLONAL IgG

The simplest method available which will enable imaging using antibodies is to take blood from a large number of donors these can be pooled and the labelled. The result will be a non-specific agent but one which will localise at the sites of highest antibody activity. This effectively means site of infection and inflammation.

Preparations of polyclonal human IgG have been used labelled with two metallic radioisotopes both of which can produce good images. The first of these is indium-111 (In-111) which is attached to the IgG via a diethylenepentaacetic acid (DPTA) linker. Trials in Europe and the United States have shown that it has a high sensitivity and specificity in imaging infection especially in patients with AIDS where a sensitivity of 94% and a specificity of 91% was obtained.

Further work has used a shorter lived isotope which gives better technetium-99m (Tc-99m). This was linked to polyclonal IgG using an iminothioline linker. Unfortunately blood pool activity remains high throughout the test and it has poor results in infections in the chest and abdomen. In the pelvis and *(however where blood pool activity is less results in identifying infection were similar to those obtained using labelled leucocytes of gallium-67 citrate. In addition it may also be used to identify inflammatory arthritis

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