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Preliminary Communication

USE OF KARPAS HIV CELL TEST TO DETECT ANTIBODIES TO HIV-2

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Summary Commercial enzyme-linked immunosorbent assays for HIV-1 infection often fail to detect antibodies to HIV-2. A simplified version of the HIV cell test detects antibodies to this new virus and enables typing of HIV infections. Since sera from 3 macaque monkeys infected with simian immunodeficiency virus gave weakly positive reactions, this test holds promise for discovering any further strains of HIV that may exist or evolve.

INTRODUCTION

LAST year Clavel et al[1] reported the isolation of a virus similar to the human immunodeficiency virus (HIV) from West African AIDS patients whose serum was negative for HIV antibodies in enzyme-linked immunosorbent assays (ELISAs), western blots, and radioimmunoprecipitation tests. This virus was designated LAV-2/HIV-2. Subsequently, AIDS due to HIV-2 was diagnosed in some French homosexuals without African connections.[2] It was established that the envelope glycoproteins of HIV-2 are distinct from the envelope glycoproteins of HIV-1.[1] We report here the use of a cell-based test, originally developed for HIV-1,[3] in detection of HIV-2 antibodies.

MATERIALS AND METHODS

Viruses

The Cambridge LAV (C-LAV) isolate[4] was used as the prototype for HIV-1, and LAV-2 (kindly provided by Dr L. Montagnier) was used as HIV-2.[1]

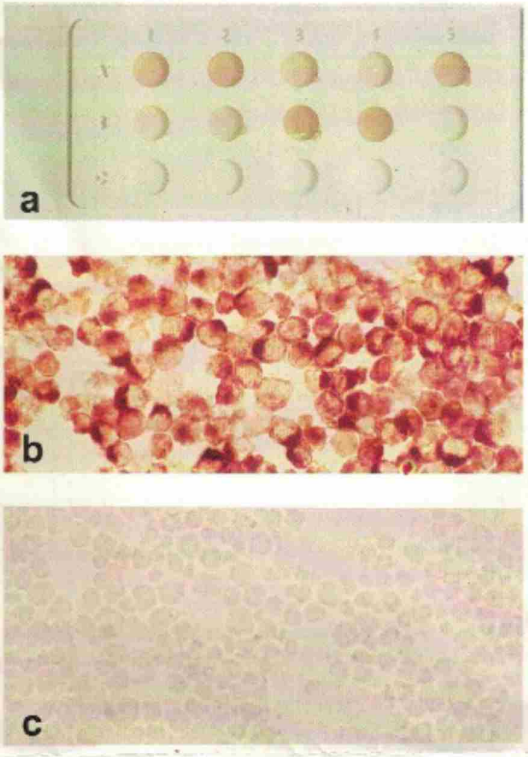
Cells

The Karpas T-cells, which were established from a child with T-cell leukaemia,[5] were infected separately with HIV-1 and HIV-2. Non-infected cells were used to control the specificity of the cell test.

Serological Studies

The sera used in this study were from: (1) control subjects known to be infected with HIV-1; (2) 4 AIDS patients infected with HIV-2 and 1 infected with both HIV-1 and HIV-2 (provided by Dr L. Montagnier); and (3) 3 macaque monkey sera with antibodies to simian immunodeficiency virus (SIV) (provided by Dr M. Daniel).[6] The monkey sera were included in the study to provide evidence on the sensitivity of the test to widely differing antigenic variants of the HIV groups.

The principles of the cell test were reported earlier.[3] The following simplified procedure was employed. Acetone-fixed cells were incubated with the sera, diluted 1:5 on phosphate-buffered saline (PBS) for 1 h at 37°C (2 h or longer at room temperature) and then washed for 5 min in PBS. The slides were then immersed in a solution of protein-A horseradish peroxidase (Zymed), diluted 1:100 in PBS, for 30 min (temperature can range between 4°C and 37°C). After a further five minutes' wash, the slides were immersed in a reconstituted aminoethylcarbazol substrate solution for 4–5 min. The reaction was stopped by dipping the slides in water. Positive reactions were indicated by pink colouration detectable by the naked eye and the specificity was verified by examination under a bench microscope with × 100 magnification.



Confirmatory slide.

(a) Row A contains cells infected with HIV-1; row B cells infected with HIV-2; and row C non-infected cells. Sera 1, 2, and 5 (wells 1, 2, and 5 a, b, c) are from individuals infected with HIV-1 and sera 3 and 4 (wells 3 and 4 a, b, c) are from individuals infected with HIV-2. Sera 1, 2, and 5 show strong reactions with HIV-1-infected cells (wells A1, A2, A5) and weaker but detectable reactions with HIV-2-infected cells (wells B1, B2, B5). Sera 3 and 4 show weak but detectable reactions with HIV-1-infected cells (wells A3–A4) but stronger reactions with HIV-2-infected cells (wells B3–B4). The nature of the reaction, and pattern and specificity of the positive staining, can be verified by microscopical examination, which shows strong cytoplasmic staining with the corresponding sera (b) and weaker staining with the heterologous sera. Sera incubated with non-infected cells and negative sera do not stain (c).

Initially, all sera were screened with the Karpas AIDS cell test on slides that contained in their wells T-cells infected with the Cambridge isolate (C-LAV/HIV-1). This was followed by a test on confirmatory slides. These confirmatory slides contained in row A cells infected with HIV-1 and in row B cells infected with HIV-2. Row C contained non-infected cells.

Radioimmunoprecipitation

Immunoprecipitation of metabolically labelled proteins from HIV-1 and HIV-2 infected cells was performed by Ms S. Chamaret, as previously described.[1]

RESULTS

Serology

With the cell test it was possible to detect reactivity between antibodies in the sera of the 5 AIDS patients infected with HIV-2 and the cells infected with HIV-1.