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**This experiment does not contain HIV virus or its components.  
None of the components have been prepared from human sources.**

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## Experiment Components

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### **Storage:**

Store entire experiment  
in the refrigerator.

All components of this experiment  
are intended for educational  
research only. They are not to be  
used for diagnostic or drug  
purposes, nor administered to or

This kit is designed for 10 lab groups

### **Contents**

- A HIV Antigens (simulated)
  - B Positive Control (primary antibody)
  - C Donor 1 Serum (simulated)
  - D Donor 2 Serum (simulated)
  - E Anti-IgG-peroxidase conjugate (secondary antibody)
  - F Hydrogen peroxide, stabilized
  - G Aminosalicyclic acid (peroxide co-substrate)
  - H Phosphate buffered saline concentrate
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- 2 Microtiter plates
  - 50 Transfer pipets
  - 60 Microtest tubes with attached caps
  - 25 1 ml pipets
  - 2 plastic tubes, 50 ml

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## Requirements

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## **Background Information**

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Acquired immune deficiency syndrome (AIDS) is a disease characterized by the progressive deterioration of an individual's immune system. The immunological impairment allows infectious agents such as viruses, bacteria, fungi and parasites to invade the body and propagate unchecked. In addition, the incidence of certain cancers dramatically increases in these patients because of their compromised immune system. AIDS is a serious threat to human health and is a global problem. Intensive research is being done to advance methods of detection, clinical treatment and prevention.

### **Retroviruses**

The AIDS etiologic agent (HIV-1) is the human immunodeficiency virus type 1, which is a retrovirus. Retroviruses contain an RNA genome and the RNA dependent DNA polymerase also termed reverse transcriptase. Members of the retrovirus family are involved in the pathogenesis of certain types of leukemias and other sarcomas in humans and animals. The

## BACKGROUND INFORMATION

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### Background Information, continued

#### Mechanism of HIV Infection

An individual can be infected with HIV through an abrasion in a mucosal surface (e.g. vaginal and rectal walls), a blood transfusion or by intravenous injection with a contaminated needle. Virus or virally infected cells are found in bodily fluids such as semen and blood. During the early stages of infection in an immunocompetent person the HIV virus elicits humoral and cellular immunity responses that result in a variety of circulating IgG molecules directed at several viral epitopes. However, since the virus has a high mutation rate the variants survive and produce progeny having a similar capacity to escape immunosurveillance.

Unlike other cellular DNA polymerases, HIV DNA polymerase (reverse transcriptase) has a high error rate (1 in  $10^4$ ). These frequent mutations continually change the viral protein epitopes. This is believed to be the main mechanism of HIV immunoevasion. The most important target for the virus are hematopoietic cells such as bone marrow derived monocytes, myelocytes and immune system lymphocytes. Infection of immune system effector cells such as T cells and macrophages ultimately produce the most profound clinical consequences. gp 120 binds to the CD4 receptors on the surface of T helper ( $T_H$ ) cells. These receptors are membrane bound glycoproteins involved in T cell maturation from precursor cells.  $T_H$  cells are required for the body's overall immunological responses. The viral lipid bilayer fuses with that of the cell's membranes and the viral protein capsid becomes internalized via receptor mediated endocytosis. Subsequently, the rest of the CD4 receptors are internalized and gp 120 appears on the T cell surface.

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