Whole Body PET/CT Imaging of HIV Replication

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Why PET/CT Imaging?

1st time to non-invasively detect HIV infection and pinpoint viral replication

• Earlier viral replication detection

• Identifies where infection is actually occurring

• Monitor virus control during HAART (Highly Active Antiretroviral Therapy)
Radiolabeled Ab or F(ab) specific for viral protein expressed on cell surface

**Targeting viral protein expressed on infected cell**

- Specific for viral protein
- Signal is proportional to virus protein levels
Acute SIV Infection in the Rhesus macaque

A – SIV+ animal with anti-SIB mAb
B – SIV+ animal with anti-SIB mAb
C – SIV- animal with anti-SIB mAb
D – SIV- with irrelevant Ab
Chronic SIV Infection in the Rhesus macaque

Non-progressing rhesus macaques infected with SIVmac239 for 2-6 years controlling viremia below 50-100 SIV RNA copies/ml plasma
HIV Imaging Applications in the Clinic

2M people living with HIV in the US and Western Europe

- Acute HIV infection detection
- HAART and vaccine efficacy monitoring
- Viral sanctuary identification
- New drug/vaccine testing
Exciting Emerging Technology in Georgia

- Viral DNA is integrated into the host cell DNA requiring host cell death to eliminate the virus.

- $^{64}\text{Cu}$ labeled antibodies are being tested as radiotherapeutics against cancer.

When given in combination with HAART, this technology has the potential to eliminate the HIV viral sanctuaries.