

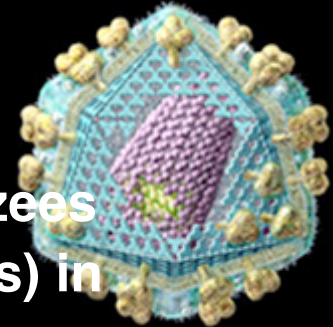


HIV/AIDS Types, Groups, and Subtypes

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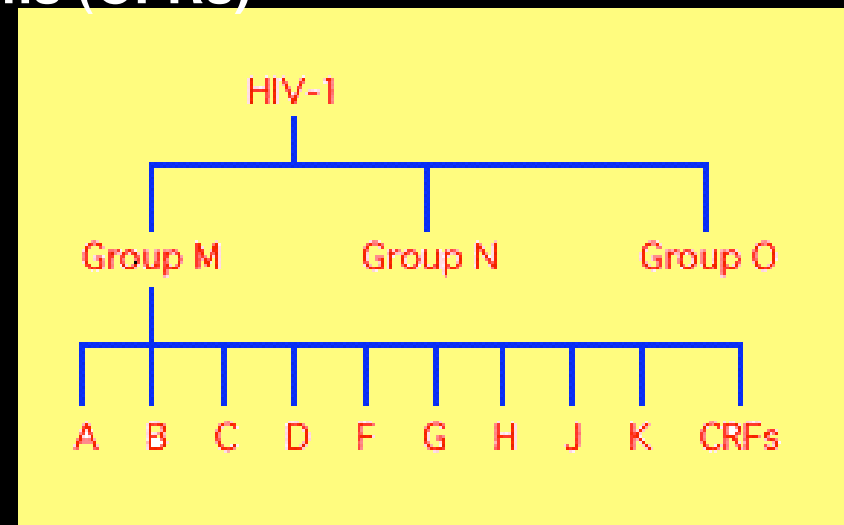
HIV-1



- **Thought to originate from SIVCZ**
 - **Simian Immunodeficiency Virus from Chimpanzees**
 - **Estimated to have Jumped to humans (zoonosis) in 1930s**
- **Makes up the majority of HIV/AIDS infections**
- **More virulent form, and therefore more easily transmitted**
- **Ways of Transmission**
- **Mutates 1-2 times during each replication cycle, most often on the *env* gene**
- **Uses Chemokine receptors as cofactors for viral entry**

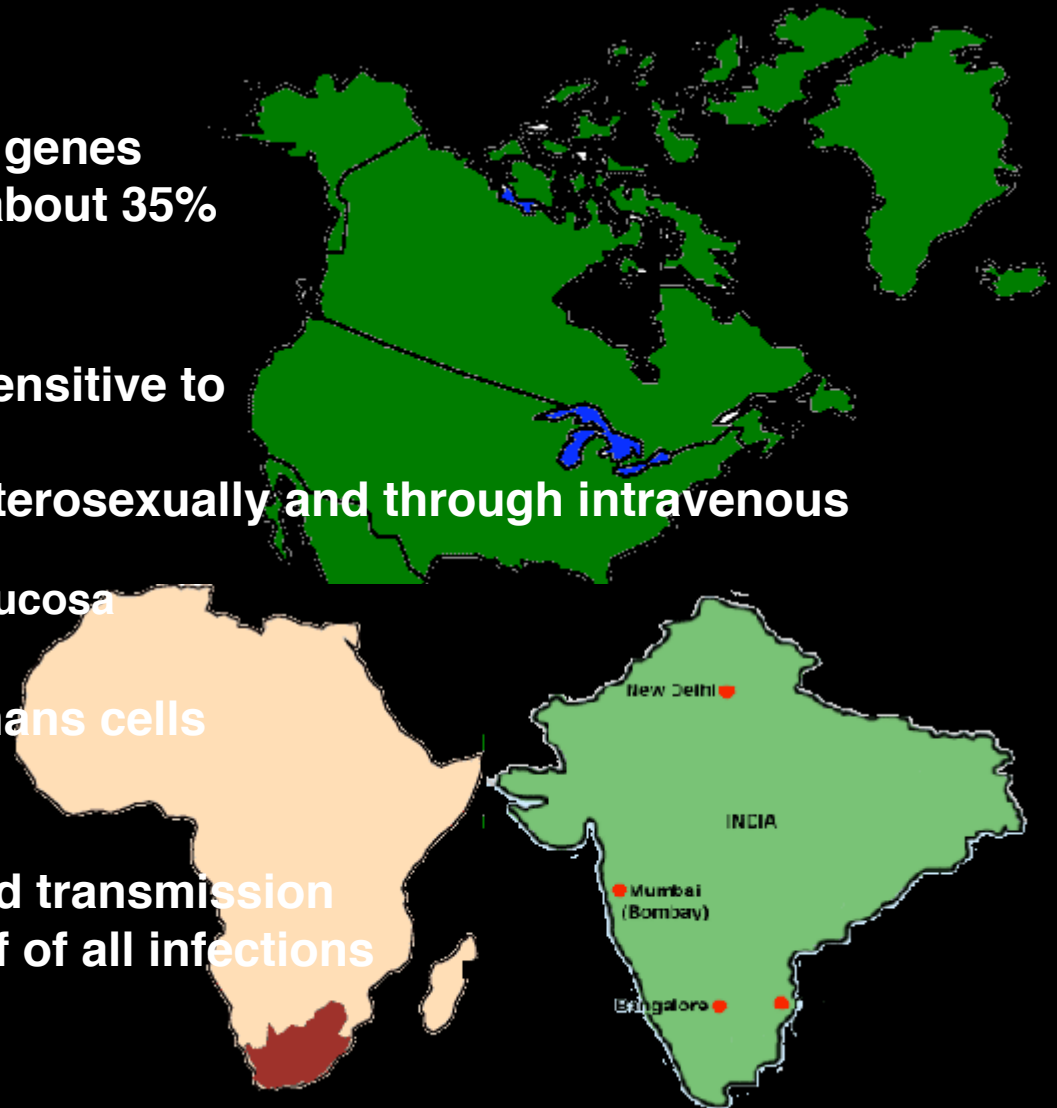
HIV-1 Groups and Clades

- **3 groups M, N, O**
 - Thought to be separate introductions of SIV to humans
 - Group M (Major Group) has 10 subtypes
 - Group N (New Group)
 - Group (Outlier Group) used to have 20 subtypes, now has none
 - Circulating Recombinant Forms (CFRs)



HIV-1 Group M

- **Subtypes A-K**
 - Variations on *gag* and *env* genes
 - Differ from each other by about 35%
- **Subtype B**
 - North America
 - Viral load tests are most sensitive to
 - Drugs designed for it
 - Spread most efficiently heterosexually and through intravenous drug injection
 - Replicate best in rectal mucosa
- **Subtype C**
 - Replicates best in Langerhans cells
 - Mainly heterosexual
 - South Africa and India
 - Most common mother-child transmission
 - Responsible for nearly half of all infections

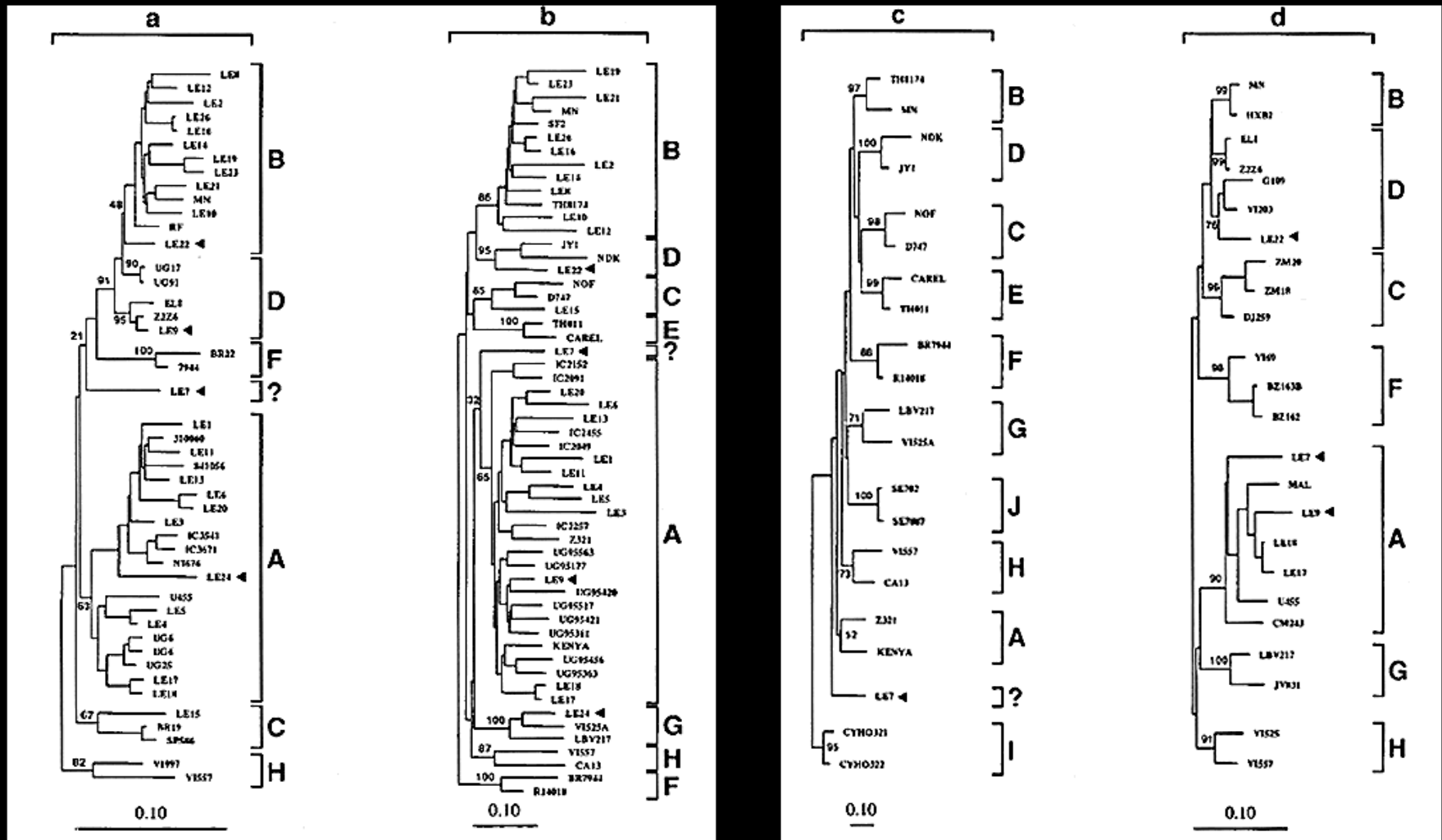


HIV-1 Group M Cont'

- **Subtype D**
 - Develop AIDS and progress to death more quickly
 - More virulent
 - Most effective in binding to immune cells
 - Sub-Saharan Africa
- **Subtype E**
 - No pure form
 - Only occurs as CRF A/E
 - A and E prefer heterosexual
 - Southeast Asia
- **Subtype I**
 - Only isolated in Cyprus
 - Actually a CRF A/G/H/K



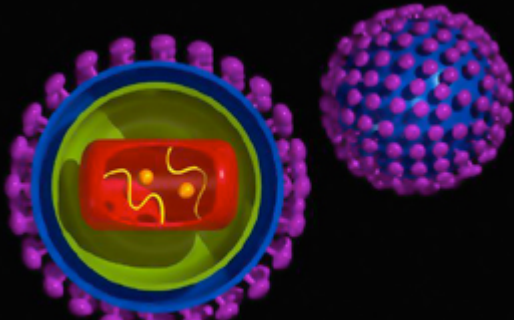
Phenotypes of Subtypes



(a) prot (b,c) env (d) gag

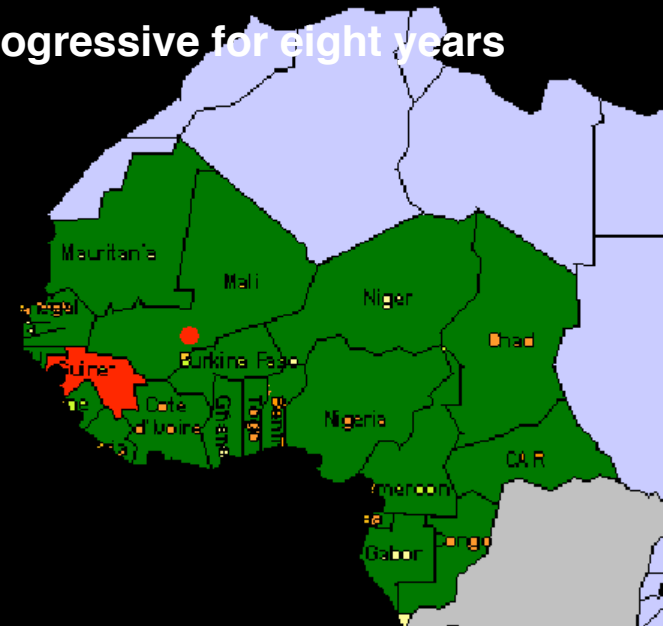
HIV-1 Immunity?

- △ **32 mutation on the gene for CCR5**
- **Heterozygous: reduces chance of infection by B clade by 70%**
- **Homozygous: immunity to B clade**
- **Used to be attributed to plague survival**
- **Now known to be due to myxoma virus survival**



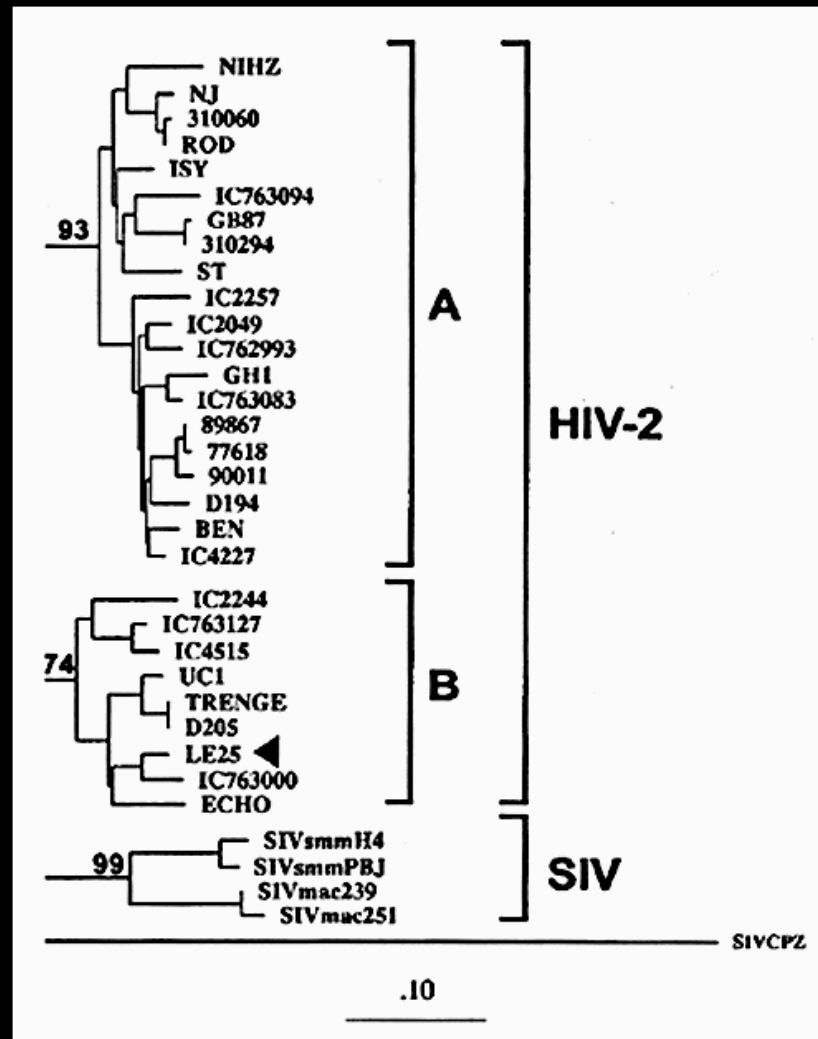
HIV-2

- **Origin: Sooty Mangabey monkeys from Guinea-Bissou**
 - First isolate in Guinea-Bissou in 1986
 - Thought to have zoonotic episode two decades after HIV-1
 - Closer to SIV
 - Contains Viral Protein X
- **Restricted mainly to West Africa**
- **Lower transmission rate**
- **Lower viral load**
- **Longer Latency period**
 - More than 95% of infected individuals are non-progressive for eight years
- **5-9 times less efficiently transmitted sexually**
- **Rare vertical transmission**
- **Higher frequency of encephalitis**
- **Lower incidence of Kaposi's sarcoma**
- **Has gp105 (more immunosuppressive)**
 - Limits viral infection in vivo

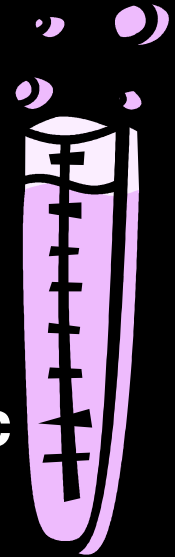


HIV-2 Subtypes

- 5 subtypes
 - A, B, C, D, E



Clinical HIV-2



- **Tests**
 - ELISA test for HIV-1 misses 70% of HIV-2
 - Only tested in U.S. if suggestive demographic behavior
 - No FDA-licensed viral load test
 - Monitor CD4+ T-cell counts
- **Viral Entry**
 - Enters on a CD4 independent pathway
 - Infects CD4 negative cells via CCR5 or CXCR4
- **Treatment**
 - Natural resistance to NNRTI-antiretroviral drugs

Works Cited

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