HIV-1 AND AIDS

I. INTRODUCTION
A. RETROVIRUSES—RETROVIRIDAE
   1. MORPHOLOGY
   2. LIFE CYCLE
      a. GENOMIC RNA --> dsDNA
      b. dsDNA --> HOST GENOME
      c. HOST GENOME --> mRNA (GENOMIC RNA)
   3. CLASSIFICATION BY GENERA
      a. MAMMALIAN C TYPE VIRUS (MuLV) ONCORNAVIRUSES
      b. MAMMALIAN B TYPE VIRUS (MMTV)
      c. TYPE D VIRUS (M-PMV, SRV)
      d. ALV-RELATED VIRUS (ALV, RSV)
      e. HTLV-BLV
      f. SPUMAVIRUS (HUMAN, SIMIAN, FELINE FOAMY V)
      g. LENTIVIRUS
         1.) PRIMATE (SIV, HIV-1, HIV-2)
         2.) VISNA
         3.) EIAV, FIV, BIV

II. HISTORY
A. FIRST APPEARANCES
B. FIRST RECOGNIZED
C. VIRA L ETIOLOGY
   1. ANTIGENS PRODUCED—TESTS-ELISA & WESTERN BLOT
   2. SEQUENCED
   3. MOLECULAR BIOLOGY
D. TREATMENTS—AZT, ddI, ddC & PROTEASE INHIBITORS (11 DRUGS)
E. VACCINES—ABOUT 15 TRIALS UNDERWAY

III. MOLECULAR BIOLOGY OF HIV-1
A. RETROVIRUS LIFE CYCLE
   1. INFECTION
   2. UNCOATING
   3. REVERSE TRANSCRIPTION
   4. INTEGRATION
   5. LATENCY
   6. TRANSCRIPTION
   7. GENE EXPRESSION—SPlicing
   8. tat & rev GENES, ETC.
   9. ASSEMBLY
   10. EXIT

IV. PATHOLOGY
A. INITIAL INFECTION
B. LATENCY
C. ARC
D. AIDS
E. STAGING—WALTER REED

V. TRANSMISSION
A. SEXUAL
B. INTRAVENOUS DRUG USE
C. BIRTH—PERINATAL

THE HIV-1 GENOME

TAR polyA PBS(181-200) DIS(~260) SD(~290) φ(~315) AUG(336)
HIV-1 PROTEINS

<table>
<thead>
<tr>
<th>PROTEIN</th>
<th>MAP (N)</th>
<th>SIZE (KB)</th>
<th>FUNCTION</th>
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<tbody>
<tr>
<td>MA</td>
<td>336</td>
<td>18</td>
<td>Matrix protein</td>
</tr>
<tr>
<td>CA</td>
<td>24</td>
<td></td>
<td>Capsid or Core protein</td>
</tr>
<tr>
<td>NC</td>
<td>17</td>
<td></td>
<td>Nucleocapsid, binds $\varphi$ &amp; primer tRNA</td>
</tr>
<tr>
<td>P6</td>
<td>6</td>
<td></td>
<td>Interacts with Vpr</td>
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<tr>
<td>P1, P2</td>
<td>1,2</td>
<td></td>
<td>??</td>
</tr>
<tr>
<td>PR</td>
<td>10</td>
<td></td>
<td>Proteinase</td>
</tr>
<tr>
<td>RT</td>
<td>66/51</td>
<td></td>
<td>Reverse transcriptase-RNAse H</td>
</tr>
<tr>
<td>IN</td>
<td>31</td>
<td></td>
<td>Integrase</td>
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<tr>
<td>Gp120</td>
<td>120</td>
<td></td>
<td>Spike protein</td>
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<tr>
<td>Gp41</td>
<td>41</td>
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<td>Transmembrane protein</td>
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<tr>
<td>Tat</td>
<td>16</td>
<td></td>
<td>Binds to TAR, Promotes transcription of unspliced mRNAs.</td>
</tr>
<tr>
<td>Rev</td>
<td>19</td>
<td></td>
<td>Binds to RRE, Transport of mRNAs</td>
</tr>
<tr>
<td>Vif</td>
<td>23</td>
<td></td>
<td>Viral infectivity factor; a late function, maturation?</td>
</tr>
<tr>
<td>Vpr</td>
<td>14</td>
<td></td>
<td>Nuclear protein, function unclear, Blocks cell cycle in S or G2</td>
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<tr>
<td>Vpu</td>
<td>16</td>
<td></td>
<td>Late function, viral release?</td>
</tr>
<tr>
<td>Nef</td>
<td>27</td>
<td></td>
<td>(3’-orf) Down regulation of CD4</td>
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