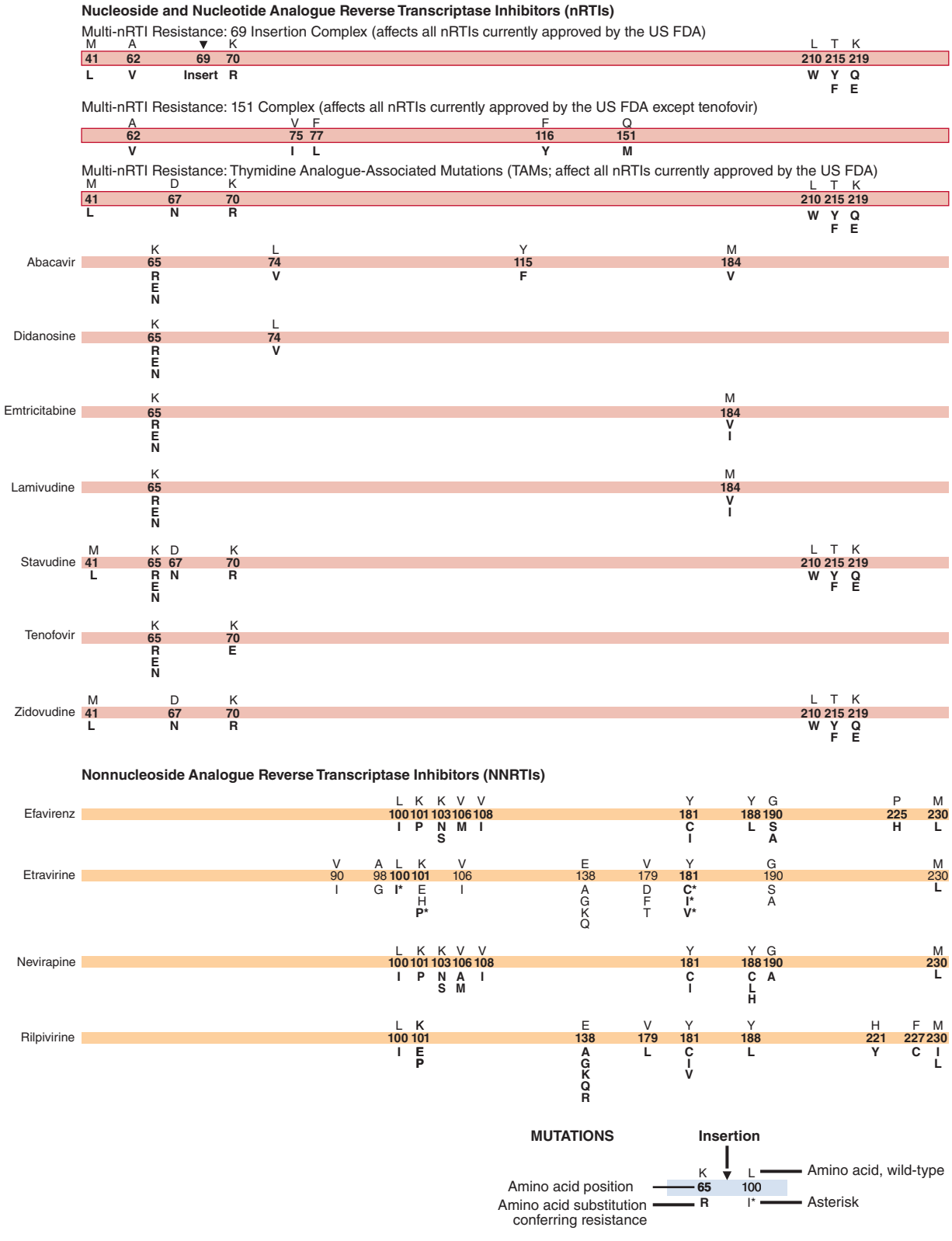

FIGURE 226-46 **Amino acid substitutions conferring resistance to antiretroviral drugs.** For each amino acid residue, the letter above the bar indicates the amino acid associated with wild-type virus and the letter(s) below indicate the substitution(s) that confer viral resistance. The number shows the position of the mutation in the protein. Mutations selected by protease inhibitors in Gag cleavage sites are not listed. HR1 indicates first heptad repeat; NAMs indicates nRTI-associated mutations; nRTI indicates nucleoside reverse transcriptase inhibitor; NNRTI indicates nonnucleoside reverse transcriptase inhibitor; PI indicates protease inhibitor. Amino acid abbreviations: A, alanine; C, cysteine; D, aspartate; E, glutamic acid; F, phenylalanine; G, glycine; H, histidine; I, isoleucine; K, lysine; L, leucine; M, methionine; N, asparagine; P, proline; Q, glutamine; R, arginine; S, serine; T, threonine; V, valine; W, tryptophan; Y, tyrosine. *(Reprinted with permission from the International Antiviral Society—USA. AM Wensing, V Calvez, HR Günthard et al: 2014 Update of the Drug Resistance Mutations in HIV-1. Top Antivir Med. 2014; 22(3):642–650. Updated information [and thorough explanatory notes] is available at www.iasusa.org.)*