

PI Major Mutations:

I84V

 •

L90M

PI Accessory Mutations:

G73S

PR Other Mutations:

L10I • I13V • K20IM • M36I • I62IV • L63P • A71V • I72V

Protease Inhibitors	
atazanavir/r (ATV/r)	High-Level Resistance
darunavir/r (DRV/r)	Low-Level Resistance
fosamprenavir/r (FPV/r)	High-Level Resistance
indinavir/r (IDV/r)	High-Level Resistance
lopinavir/r (LPV/r)	Intermediate Resistance
nelfinavir (NFV)	High-Level Resistance
saquinavir/r (SQV/r)	High-Level Resistance
tipranavir/r (TPV/r)	Intermediate Resistance

PR comments

Major

- I84V is a nonpolymorphic substrate-cleft mutation selected by each of the PIs. I84V reduces susceptibility to LPV, ATV, and DRV.
- L90M is a non-polymorphic PI-selected mutation that reduces susceptibility to ATV and to a lesser extent LPV.

Accessory

- G73S/T/C/A are common non-polymorphic accessory mutations selected primarily by most PIs. They are associated with minimally reduced susceptibility to each of the PIs.

Other

- L10I/V are polymorphic, PI-selected accessory mutations that increase the replication of viruses with other PI-resistance mutations.
- K20I is the consensus amino acid in subtype G and CRF02_AG. In subtypes B and C, K20I is a PI-selected mutation of uncertain effects on currently used PIs.
- K20M/V are uncommonrelatively non-polymorphic PI-selected mutations that have not been well studied.
- A71W/T are polymorphic, PI-selected accessory mutations that increase the replication of viruses with other PI-resistance mutations.

- There is evidence for low-level DRV resistance. If DRV is administered it should be used twice daily.

Drug resistance mutation scores of PI:

Download CSV

Rule	ATV/r ÷	DRV/r ÷	FPV/r ÷	IDV/r ÷	LPV/r ÷	NFV ÷	SQV/r ÷	TPV/r ÷
<u>G73S</u>	10	0	10	15	5	15	15	0
<u>G73S + L90M</u>	10	0	10	10	0	10	10	0
<u>I84V</u>	60	15	60	60	30	60	60	30
<u>L90M</u>	25	0	20	30	15	60	45	0
Total	105	15	100	115	50	145	130	30

NRTI Mutations:

M41L

 •

D67N

 •

M184I

 •

L210W

 •

T215Y

 •

K219R

NNRTI Mutations:

None

RT Other Mutations:

V35I • K43E • K122E • I202V • R211K • D218E • D250E • S251D

Nucleoside Reverse Transcriptase Inhibitors		Non-nucleoside Reverse Transcriptase Inhibitors	
abacavir (ABC)	High-Level Resistance	doravirine (DOR)	Susceptible
zidovudine (AZT)	High-Level Resistance	efavirenz (EFV)	Susceptible
stavudine (D4T)	High-Level Resistance	etravirine (ETR)	Susceptible
didanosine (DDI)	High-Level Resistance	nevirapine (NVP)	Susceptible
emtricitabine (FTC)	High-Level Resistance	rilpivirine (RPV)	Susceptible
lamivudine (3TC)	High-Level Resistance		
tenofovir (TDF)	High-Level Resistance		

RT comments

NRTI

- M41L is a TAM that usually occurs with T215Y. In combination, M41L plus T215Y confer intermediate / high-level resistance to AZT and d4T and contribute to reduced ddi, ABC and TDF susceptibility.
- D67N is a non-polymorphic TAM associated with low-level resistance to AZT.
- M184V/I cause high-level in vitro resistance to 3TC and FTC and low/intermediate resistance to ABC (3-fold reduced susceptibility). M184V/I are not contraindications to continued treatment with 3TC or FTC because they increase susceptibility to AZT and TDF and are associated with clinically significant reductions in HIV-1 replication.
- L210W is a TAM that usually occurs in combination with M41L and T215Y. The combination of M41, L210W and T215Y causes high-level resistance to AZT and intermediate resistance to ABC and TDF.
- T215Y/F are TAMs that causes intermediate/high-level resistance to AZT and potentially low-level resistance to ABC and TDF.
- K219E/Q/N/R are accessory TAMs that usually occur in combination with multiple other TAMs.

Drug resistance mutation scores of *NNRTI*: [Download CSV](#)

Rule	ABC ÷	AZT ÷	D4T ÷	DDI ÷	FTC ÷	3TC ÷	TDF ÷
<u>M41L</u>	5	15	15	10	0	0	5
<u>M41L + D67N + T215Y</u>	5	5	5	5	0	0	5
<u>M41L + M184I + T215Y</u>	10	0	0	0	0	0	0
<u>M41L + L210W</u>	10	10	10	10	0	0	10
<u>M41L + L210W + T215Y</u>	10	0	0	0	15	15	10
<u>M41L + T215Y</u>	10	10	10	10	5	5	10
<u>D67N</u>	5	15	15	5	0	0	5
<u>D67N + T215Y + K219R</u>	5	5	5	5	0	0	5
<u>M184I</u>	15	-10	-10	10	60	60	-10
<u>L210W</u>	5	15	15	10	0	0	5
<u>L210W + T215Y</u>	10	10	10	10	0	0	10
<u>T215Y</u>	10	60	40	15	0	0	10
<u>K219R</u>	5	10	10	5	0	0	5
Total	105	145	125	95	80	80	70

No drug resistance mutations were found for *NNRTI*.