

PI Major Mutations:None

PI Accessory Mutations:L33F

PR Other Mutations:V11X • T12L • I13* • K14* • G16E • E21X • M36I • P39S • R57K • D60E • E65D • H69K • L89M

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

PR comments

Accessory

- L33F is a relatively non-polymorphic accessory mutation selected by each of the PIs. In combination with other PI-resistance mutations, it is associated with reduced susceptibility to LPV, ATV, and DRV.

Drug resistance mutation scores of PI:

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Rule	ATV/r ⚡	DRV/r ⚡	FPV/r ⚡	IDV/r ⚡	LPV/r ⚡	NFV ⚡	SQV/r ⚡	TPV/r ⚡
L33F	5	5	10	5	5	10	5	10

NRTI Mutations:D67N • K70R • M184V • T215I • K219E

NNRTI Mutations:L100I • K103N

RT Other Mutations:E6N • V35T • T39S • K49R • V60I • K102R • K122E • D123N • I135T • K166T • K173S • Q174K • D177E • V179I • Q182X • T200A • I202V • Q207D • L210F • R211K • P217L • D218E • P225X • P226S • L228R • Y232D • P236X • P243L • I244* • L246V • E248* • K249H • D250E • W252* • T253L • V254S • N255* • D256L • I257Q • Q258N

Nucleoside Reverse Transcriptase Inhibitors	
abacavir (ABC)	Intermediate Resistance
zidovudine (AZT)	High-Level Resistance
stavudine (D4T)	High-Level Resistance
didanosine (DDI)	Intermediate Resistance
emtricitabine (FTC)	High-Level Resistance
lamivudine (3TC)	High-Level Resistance
tenofovir (TDF)	Low-Level Resistance

Non-nucleoside Reverse Transcriptase Inhibitors	
doravirine (DOR)	Intermediate Resistance
efavirenz (EFV)	High-Level Resistance
etravirine (ETR)	Intermediate Resistance
nevirapine (NVP)	High-Level Resistance
rilpivirine (RPV)	High-Level Resistance

RT comments

NRTI

- **D67N** is a non-polymorphic TAM associated with low-level resistance to AZT.
- **K70R** is a TAM that confers intermediate resistance to AZT and contributes to reduced ABC and TDF susceptibility in combination with other TAMs.
- **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.
- T215Y/F are TAMs that causes intermediate/high-level resistance to AZT and potentially low-level resistance to ABC and TDF. **T215S/C/D/E/I/V/N/A/L** do not reduce NRTI susceptibility but arise from viruses that once contained T215Y/F. The presence of one of these revertant mutations suggests that the patient may have once been infected with a virus containing T215Y/F.
- **K219E/Q/N/R** are accessory TAMS that usually occur in combination with multiple other TAMs.

NNRTI

- **L100I** is a non-polymorphic mutation that usually occurs in combination with K103N. In this setting it confers high-level resistance to NVP, EFV, and RPV and intermediate resistance to ETR and DOR.
- **K103N** is a non-polymorphic mutation that confers high-level reductions in NVP and EFV susceptibility. It is the most commonly transmitted DRM.

Other

- **V179I** is a polymorphic mutation that is frequently selected in persons receiving ETR and RPV. However, it has little, if any, direct effect on NNRTI susceptibility.

Mutation scoring: RT

HIVDB 9.5.1 (2023-11-05)

Drug resistance mutation scores of NRTI:

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Rule	ABC ↕	AZT ↕	D4T ↕	DDI ↕	FTC ↕	3TC ↕	TDF ↕
<u>D67N</u>	5	15	15	5	0	0	5
<u>D67N + K70R + M184V + K219E</u>	10	0	0	0	0	0	0
<u>D67N + K70R + K219E</u>	10	15	10	10	10	10	10
<u>K70R</u>	5	30	15	10	0	0	5
<u>M184V</u>	15	-10	-10	10	60	60	-10
<u>T215I</u>	5	20	20	10	0	0	5
<u>K219E</u>	5	10	10	5	0	0	5
Total	55	80	60	50	70	70	20

Drug resistance mutation scores of NNRTI:

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Rule	DOR ↕	EFV ↕	ETR ↕	NVP ↕	RPV ↕
<u>L100I</u>	15	60	30	60	60
<u>L100I + K103N</u>	15	0	0	0	0
<u>K103N</u>	0	60	0	60	0
Total	30	120	30	120	60