

PI Major Mutations:None

PI Accessory Mutations:None

PR Other Mutations:

V11X

 • T12A • I13S •

K14*

 •

I15D

 • G16R • Q18K • K20R • E35D • M36I • N37K • R41K • R57K • H69K • K70R • L89M

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

PR comments

Other

- K20R** is a highly polymorphic PI-selected accessory mutation that increases replication fitness in viruses with PI-resistance mutations.

No drug resistance mutations were found for PI.

NRTI Mutations:

K65R

 •

S68G

 •

M184V

NNRTI Mutations:

L100I

 •

K103N

 •

E138G

RT Other Mutations:E6D • K20R • V35T • E40D • K49R • V60I • K122E • D123S • I135T •

F171X

 • K173S • Q174R • V179I •

Q182X

 • T200A • I202V • E203Q • Q207D • E224D •

Y232M

 •

E233N

 •

Δ234

 •

H235S

 • P236S • P243L •

I244S

 • V245E •

P247X

 • K249E •

N255M

 •

D256I

 •

I257Y

 • Q258R •

K259I

 • L260V •

V261E

 •

G262T

 •

L264W

 •

N265Q

 •

W266S

 •

A267I

 •

S268M

 •

Δ270-273

 •

I274X

 • K277R •

K281S

 •

L282S

 •

L283S

 •

R284A

 •

G285D

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

RT comments

NRTI

- **K65R** confers intermediate reductions in susceptibility to TDF, ABC, and 3TC/FTC. It increases AZT susceptibility. In NRTI-experienced, INSTI-naïve patients with **K65R**, TDF+3TC+DTG is usually highly effective and more effective than AZT/3TC/DTG. However, in patients receiving TDF+3TC+DTG, there is a risk of emergent DTG resistance that does not arise in NRTI-naïve patients receiving TDF+3TC+DTG.
- **S68G** is a polymorphic mutation that is often selected in combination with K65R. It partially restores the replication defect associated with K65R.
- **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.

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.
- **E138Q/G** are non-polymorphic accessory mutations selected by ETR occasionally NVP and EFV. They cause low-level reductions in susceptibility to NVP, RPV, and ETR.

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.
- L234I is a nonpolymorphic mutation selected in persons receiving NVP and EFV. It is also selected in vitro by ETR and DOR. In combination with V106A, it is associated with high-level DOR resistance. Its effect on susceptibility when it occurs alone has not been well characterized. **L234del** is a highly unusual mutation at this position.
- P236L is a rare mutation selected commonly by DLV, which appears to have little if any effect on current NNRTIs. **P236S** is a highly unusual mutation at this position.

Mutation scoring: RT

HIVDB 9.5.1 (2023-11-05)

Drug resistance mutation scores of NRTI:

Download CSV



Rule	ABC ↕	AZT ↕	D4T ↕	DDI ↕	FTC ↕	3TC ↕	TDF ↕
K65R	45	-10	60	60	30	30	50
M184V	15	-10	-10	10	60	60	-10
K65R + S68G	0	0	0	0	0	0	5
Total	60	-20	50	70	90	90	45

Drug resistance mutation scores of NNRTI:

Download CSV



Rule	DOR ↕	EFV ↕	ETR ↕	NVP ↕	RPV ↕
L100I	15	60	30	60	60
L100I + K103N	15	0	0	0	0
K103N	0	60	0	60	0
E138G	0	10	10	10	15
Total	30	130	40	130	75