

PI Major Mutations:

M46I100%
from:80%

 •

I50V100%
from:43%

 •

I54V100%
from:37%

 •

L76V100%
from:63%

PI Accessory Mutations:None

PR Other Mutations:

L10V100%
from:42%

 •

I13V99%
from:44%

 •

K14KR9.49%
from:47%

 •

I15IV1.94%
from:37%

 •

L19I99%
from:43%

 •

K20R97%
from:70%

 •

E35D99%
from:30%

 •

M36I99%
from:32%

 •

N37E10%
from:32%

 •

R41K99%
from:47%

 •

K35R100%
from:30%

 •

R57K100%
from:38%

 •

D60E100%
from:34%

 •

Q61N94%
from:34%

 •

I62V100%
from:34%

 •

L63P100%
from:34%

 •

H69R97%
from:30%

 •

A71V99%
from:30%

 •

L89I99%
from:37%

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

- PR comments
- Major
 - M46I/L are relatively non-polymorphic PI-selected mutations. In combination with other PI-resistance mutations, they are associated with reduced susceptibility to each of the PIs except DRV.
 - I50V is a nonpolymorphic mutation selected by FPV, LPV and DRV. It reduces susceptibility to LPV and DRV.
 - I54V is a non-polymorphic PI-selected mutation that contributes reduced susceptibility to each of the PIs except DRV.
 - L76V is a non-polymorphic mutation selected by IDV, LPV and DRV and reduces susceptibility to LPV and DRV.
- Other
 - L10I/V are polymorphic, PI-selected accessory mutations that increase the replication of viruses with other PI-resistance mutations.
 - K20R is a highly polymorphic PI-selected accessory mutation that increases replication fitness in viruses with PI-resistance mutations.
 - A71V/T are polymorphic, PI-selected accessory mutations that increase the replication of viruses with other PI-resistance mutations.

- There is evidence for intermediate 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 ⇅
M46I	10	0	10	10	10	30	10	5
I54V	15	0	10	15	15	20	15	20
I50V	0	20	60	0	30	15	15	-5
L76V	0	20	60	30	30	10	0	-5
M46I + L76V	0	0	10	10	10	10	0	0
Total	25	40	150	65	95	85	40	15

NRTI Mutations:

M41L99%
from:41%

 •

D67N99%
from:29%

 •

T69D99%
from:20%

 •

V75M99%
from:40%

 •

M184MV9.52%
from:8%

NNRTI Mutations:

A98G99%
from:28%

 •

L100LI1.18%
from:1.25%

 •

K103M100%
from:74%

 •

Y181YC9.42%
from:11%

RT Other Mutations:

P4Q100%
from:97%

 •

K20R99%
from:71%

 •

V35T100%
from:58%

 •

T39A100%
from:57%

 •

V60I99%
from:33%

 •

K122E100%
from:34%

 •

D123S97%
from:23%

 •

I135L97%
from:28%

 •

T165TI1.94%
from:23%

 •

K173A99%
from:23%

 •

Q174R99%
from:23%

 •

D177E99%
from:23%

 •

T286A100%
from:37%

 •

E291D100%
from:8%

 •

V292I99%
from:8%

 •

I293V99%
from:8%

 •

P294T100%
from:8%

 •

R307K99%
from:27%

 •

K311KR9.94%
from:33%

 •

V317A99%
from:48%

 •

S322T100%
from:77%

 •

G335D100%
from:5.14%

 •

M357K99%
from:1.22%

 •

G359A100%
from:2.26%

 •

K366R99%
from:30%

 •

A371V100%
from:88%

 •

I375V100%
from:77%

 •

T377M100%
from:77%

 •

K390R99%
from:34%

 •

E395D99%
from:24%

 •

A400T100%
from:24%

 •

T403M99%
from:28%

E404D99%
from:34%

 •

E432D99%
from:38%

 •

V435A100%
from:33%

 •

E449ED10.94%
from:28%

 •

K451R99%
from:32%

 •

V467I99%
from:30%

 •

T470P99%
from:31%

 •

D471E100%
from:31%

 •

Q480H100%
from:34%

 •

H483Y99%
from:30%

 •

Q487QR10.94%
from:33%

 •

L491PT9.14%
from:33%

 •

K512R99%
from:33.6%

 •

Q524K100%
from:5.46%

 •

K527E99%
from:4.29%

 •

E529D99%
from:7.25%

 •

A534S100%
from:5.33%

 •

A554S99%
from:13.47%

Nucleoside Reverse Transcriptase Inhibitors		Non-nucleoside Reverse Transcriptase Inhibitors	
abacavir (ABC)	Low-Level Resistance	doravirine (DOR)	High-Level Resistance
zidovudine (AZT)	Intermediate Resistance	efavirenz (EFV)	High-Level Resistance
stavudine (D4T)	High-Level Resistance	etravirine (ETR)	High-Level 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)	Susceptible		

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.
- T69D** is a nonpolymorphic mutation selected by early NRTIs that does not appear to reduce AZT, ABC, or TDF susceptibility.
- V75T**/**M**/**A**/**S** are nonpolymorphic accessory NRTI-selected mutations. They appear to have minimal phenotypic effects on AZT, ABC, and TDF.
- 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

- A98G** is a non-polymorphic accessory mutation associated with low-level reduced susceptibility to each of the NNRTIs.
- 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.
- Y181C** is a non-polymorphic mutation selected in persons receiving NVP, ETR and RPV. It confers high-level resistance to NVP, intermediate resistance to ETR and RPV, and low-level resistance to EFV. It does not significantly reduce DOR susceptibility.

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 ↕
M41L	5	15	15	10	0	0	5
D67N	5	15	15	5	0	0	5
M184MV	15	-10	-10	10	60	60	-10
V75M	0	10	30	15	0	0	0
T69D	0	0	10	30	0	0	0
Total	25	30	60	70	60	60	0

Drug resistance mutation scores of NNRTI:

Download CSV

Rule	DOR ↕	EFV ↕	ETR ↕	NVP ↕	RPV ↕
A98G	15	15	10	30	15
A98G + Y181YC	5	5	5	5	5
L100LI	15	60	30	60	60
L100LI + K103N	15	0	0	0	0
K103N + Y181YC	5	0	0	0	0
Y181YC	10	30	30	60	45
K103N	0	60	0	60	0
Total	65	170	75	215	125

Drug resistance interpretation: IN

HIVDB 9.5.1 (2023-11-05)

INSTI Major Mutations:

None

INSTI Accessory Mutations:

None

IN Other Mutations:

E11D ^{100%}_{seen=20,343} • K14KR ^{6-100%}_{seen=22,362} • S17T ^{100%}_{seen=25,275} • V31I ^{100%}_{seen=25,275} • I60L ^{99%}_{seen=23,862} • T112N ^{9-100%}_{seen=7,328} • I113V ^{100%}_{seen=7,328} • T124A ^{99%}_{seen=7,380} • T125A ^{100%}_{seen=7,380} • V126F ^{100%}_{seen=7,380} • G134N ^{97%}_{seen=18,862} • I135V ^{99%}_{seen=18,862} • K136Q ^{100%}_{seen=18,862} • D167DE ^{10-100%}_{seen=26,274} • V201I ^{100%}_{seen=26,274} • T218S ^{99%}_{seen=32,203} • Y227F ^{100%}_{seen=32,271} • L234I ^{100%}_{seen=33,026} • S255K ^{100%}_{seen=32,300} • S283G ^{99%}_{seen=32,800}

Integrase Strand Transfer Inhibitors

bictegravir (BIC)	Susceptible
cabotegravir (CAB)	Susceptible
dolutegravir (DTG)	Susceptible
elvitegravir (EVG)	Susceptible
raltegravir (RAL)	Susceptible

Mutation scoring: IN

HIVDB 9.5.1 (2023-11-05)

No drug resistance mutations were found for INSTI.