Drug resistance interpretation: PR

HIVDB 9.5.1 (2023-11-05)

PI Major Mutations: None
PI Accessory Mutations: None
PR Other Mutations: L10X • V11M • T12Y • I13R • K14P • I15E • G16R • G17I • Q18D • L19S • K20P • E21R • A22E • L24T • D25S • T26S • M36X • L38V • R41K • I50S • L63P • I72V

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

- L24I is a non-polymorphic mutation selected by IDV and LPV. It contributes reduced susceptibility to ATV and LPV. L24F/M are uncommon non-polymorphic PI-selected mutations. L24F has a susceptibility profile similar to L24I. **L24T** is a highly unusual mutation at this position.
- I50V is a nonpolymorphic mutation selected by FPV, LPV and DRV. It reduces susceptibility to LPV and DRV. I50L is a non-polymorphic mutation selected by ATV. It causes high-level resistance to ATV and increases susceptibility to LPV and DRV. **I50S** is a highly unusual mutation at this position.

Mutation scoring: PR

HIVDB 9.5.1 (2023-11-05)

No drug resistance mutations were found for PI.

Drug resistance interpretation: RT

HIVDB 9.5.1 (2023-11-05)

NRTI Mutations: D67N • T69D • K70R • M184V
NNRTI Mutations: V179T • G190A • P225H
RT Other Mutations: K20R • E28A • V35T • T39M • E40D • K49R • V60I • K101L • K103* • K104S • S105N • V106C • T107V • V108N • L109S • D110L • V111G • G112E • D113P • A114K • Y115H • F116* • S117Q • K122S • D123N • F124T • R125T • K126D • Y127K • T128R • A129S • F130R • T131I • I132R • P133T • I135R • N137R • T139I_LKEP • P140T • G141W • I142S • R143V • Y144L • Q145* • Y146P • N147I • V148* • P150* • Q151N • G152R • W153K • S156A • P157N • A158S • I159F • S162R • M164L • E169D • K173S • Q174K • D177E • I178L • L193X • T200A • Q207E • L210* • F214L • G231D • Y232M • E233T • L234T • H235S • P236D • D237N • Δ238-240 • V241G • P243S • I244A • V245I • L246Q • P247L • E248Q • D250R • Q258R • K259Q • L260* • V261W • G262K • K263A • L264K • N265W • W266P

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

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

RT comments

NRTI

- **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.
- **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.

NNRTI

- **V179T** is a rare non-polymorphic mutation occasionally selected in persons receiving NNRTIs. It is associated with minimal, if any, reduction in ETR and RPV susceptibility.
- **G190A** is a non-polymorphic mutation that causes high-level resistance to NVP and intermediate resistance to EFV. It does not significantly reduce susceptibility to RPV, ETR, or DOR.
- **P225H** is a non-polymorphic EFV-selected mutation that usually occurs in combination with K103N. The combination of **P225H** and K103N synergistically reduces NVP, EFV and DOR susceptibility.

Other

- K101E is a non-polymorphic accessory mutation that confers intermediate resistance to NVP and RPV and low-level reductions in susceptibility to EFV, ETR, and DOR when it occurs with other NNRTI-resistance mutations. K101H is a non-polymorphic accessory mutation selected by NVP, EFV and ETR. When present with other NNRTI-resistance mutations, it contributes reduces susceptibility to these NNRTIs. K101P is a non-polymorphic mutation that confers high-level resistance to NVP, EFV, RPV, and ETR. Its does not appear to reduce DOR susceptibility. K101Q is a relatively non-polymorphic mutation that is weakly selected in persons receiving NVP and EFV. It is of uncertain phenotypic and clinical significance. **K101L** is a highly unusual mutation at this position.
- V106A is a non-polymorphic mutation that confers high-level resistance to NVP and DOR, and intermediate resistance to EFV. V106M is a non-polymorphic mutation that confers high-level resistance to NVP and EFV. It is selected in vitro and in vivo by DOR and preliminary data suggests it reduces DOR susceptibility about 3-fold. It is commonly selected in vitro and in vivo by DOR. **V106C** is a highly unusual mutation at this position.
- V108I is a relatively non-polymorphic accessory mutation selected in vitro and/or in vivo with each of the NNRTIs. It appears to contribute to reduced susceptibility to most NNRTIs only in combination with other NNRTI-resistance mutations. **V108N** is a highly unusual mutation at this position.
- Y115F causes intermediate resistance to ABC and low-level resistance to TDF. **Y115H** is a highly unusual mutation at this position.
- Q151M causes intermediate/high-level resistance to AZT and ABC, and low-level resistance to TDF, 3TC and FTC. In combination with two or more accessory mutations at positions 62, 75, 77, and 116, it confers high-level resistance to AZT and ABC and intermediate resistance to TDF, 3TC and FTC. Q151L is an extremely rare transitional mutation that may precede the emergence of the Q151M. **Q151N** is a highly unusual mutation at this position.
- 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. **L234T** 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. **P236D** is a highly unusual mutation at this position.
- K238T/N are uncommon non-polymorphic mutations selected in persons receiving NVP and EFV usually in combination with K103N. Alone, K238T/N appear to have minimal effects on NNRTI susceptibility. **K238del** is a highly unusual mutation at this position.

- This virus is predicted to have low-level reduced susceptibility to **RPV**. The use of the combination of CAB/**RPV** should be considered to be relatively contraindicated.

Mutation scoring: RT

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Drug resistance mutation scores of NRTI:

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Rule	ABC	AZT	D4T	DDI	FTC	3TC	TDF
D67N	5	15	15	5	0	0	5
K70R	5	30	15	10	0	0	5
M184V	15	-10	-10	10	60	60	-10
T69D	0	0	10	30	0	0	0
Total	25	35	30	55	60	60	0

Drug resistance mutation scores of NNRTI:

Download CSV

Rule	DOR	EFV	ETR	NVP	RPV
P225H	20	45	0	45	0
G190A	0	45	10	60	15
Total	20	90	10	105	15