Drug resistance interpretation: IN — HIVDB 9.5.1 (2023-11-05)

INSTI Major Mutations: E92EQ • G140GS • Q148QK • N155NH
INSTI Accessory Mutations: H51HY • G163GR
IN Other Mutations: L101I • T112I • T124TADN • I162IV • V201VI • K211Q • I217V

Integrase Strand Transfer Inhibitors	
bictegravir (BIC)	High-Level Resistance
cabotegravir (CAB)	High-Level Resistance
dolutegravir (DTG)	High-Level Resistance
elvitegravir (EVG)	High-Level Resistance
raltegravir (RAL)	High-Level Resistance

IN comments

Major

- **E92Q** is a common non-polymorphic mutation selected in persons receiving RAL and EVG. It reduces RAL susceptibility 3 to 10-fold and EVG susceptibility ~30-fold. It does not reduce susceptibility to BIC, CAB, and DTG.
- **G140S/A/C** are non-polymorphic mutations that usually occur with Q148 mutations. Alone, they have minimal effects on INSTI susceptibility. However, in combination with Q148 mutations they are associated with high-level resistance to RAL and EVG and intermediate reductions in DTG and BIC susceptibility.
- **Q148H/K/R** are nonpolymorphic mutations reported in persons receiving RAL, EVG, CAB, and DTG. They nearly always occur in combination with G140A/S or E138K. In this setting they are associated with near complete resistance to RAL and EVG, high-levels of reduction in CAB susceptibility, and low-to-intermediate reductions in DTG and BIC susceptibility.
- **N155H** is a common nonpolymorphic INSTI-resistance mutations. It has been reported in a high proportion of persons developing VF and HIVDR while receiving RAL, EVG, DTG, and CAB. Alone, it reduces RAL and EVG susceptibility about 10 and 30-fold, respectively. It has minimal effect on susceptibility to DTG, BIC, and CAB.

Accessory

- **H51Y** is an uncommon nonpolymorphic accessory mutation selected in vitro by EVG, DTG, and CAB. Alone, it has minimal if any effect on INSTI susceptibility.
- **G163R/K** are nonpolymorphic in all subtypes except subtype F. They are accessory resistance mutations as they usually occur in combination with other INSTI-resistance mutations particularly N155H.

- There is evidence for high-level **DTG** resistance. If **DTG** is used, it should be administered twice daily.

Mutation scoring: IN — HIVDB 9.5.1 (2023-11-05)

Drug resistance mutation scores of INSTI: Download CSV

Rule	BIC	CAB	DTG	EVG	RAL
H51HY	10	15	10	15	15
E92EQ	10	15	10	60	30
E92EQ + N155NH	10	20	10	10	10
G140GS	10	10	10	30	30
G140GS + Q148QK	10	20	10	0	0
Q148QK	30	50	30	60	60
Q148QK + N155NH	20	20	20	0	0
Q148QK + G163GR	5	20	5	0	0
N155NH	10	25	10	60	60
G163GR	0	0	0	15	15
Total	115	195	115	250	220