



BRITISH COLUMBIA
CENTRE for EXCELLENCE
in HIV/AIDS

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Updates to BC-CfE HIV-1 Resistance Genotype Reports

Dear Healthcare Provider,

The BC-CfE Laboratory is streamlining reporting processes for certain tests in order to simplify distribution and record-keeping, and to ensure completeness of results. Beginning September 2, 2025, results for the 'Resistance Analysis of HIV-1 Protease and Reverse Transcriptase' and 'HIV-1 Integrase Resistance Genotype' tests will be combined into a single 'HIV-1 Resistance Genotype Report'.

Since 2022, all requests for HIV-1 resistance genotyping have included analyses of Nucleoside Reverse Transcriptase Inhibitor (NRTI), Non-nucleoside Reverse Transcriptase Inhibitor (NNRTI), Protease Inhibitor (PI) and Integrase Strand Transfer Inhibitor (INSTI) resistance. Beginning September 2, 2025, INSTI resistance will be reported together with NRTI, NNRTI and PI resistance. With this change, resistance results for these four antiretroviral classes will be reported on a single page.

The report also introduces some formatting and display changes that are highlighted below, and in the example report on the following page.

- Nomenclature used to report INSTI resistance has been updated to ensure consistency across the four antiretroviral classes; however, color coding of INSTI resistance interpretations remains unchanged: Results previously reported as "High-Level Resistance" are now reported as "Resistant" (on a red background). Results previously reported as "Low-Level Resistance" or "Intermediate Resistance" are now reported as "Reduced Response" (on a yellow background).
- To ensure consistency in result interpretation, the updated report ensures that the same versions of resistance interpretation algorithms are used for INSTI and doravirine (NNRTI) resistance, where applicable. This may require previously-collected results to be re-interpreted with an updated algorithm. In such cases, re-interpretation will be performed automatically, and noted on the report. Version numbers of all resistance interpretation algorithms are provided in the report footer.
- Reports will only be issued once resistance testing for all four antiretroviral classes is complete. Interim reports containing partial results will not be available.
- The new reporting format eliminates the need for separate "failure" reports. Testing failures (including partial test failures of one of the components of HIV-1 Resistance Genotyping) will be communicated in the updated report format.

HIV-1 Resistance Genotyping test methods have not changed. There are also no changes to test requisitions or specimen collection requirements. The targeted test turnaround time of 14 days *from sample receipt to the time we issue the report* will not change.

For more information on these changes, or to suggest how to improve this report, please contact the lab at 1-800-517-1119 or email lab@bccfe.ca. Please do not include any client information in your email.

Regards,

Chanson Brumme, PhD
Assistant Director, BC-CfE Research Laboratories



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Updated Title

Updated Header for Patient,
Test and Provider Details

HIV-1 Resistance Genotype Report

CONFIDENTIAL

Patient Details		Sample/Test Details		Provider Details	
Name:	LONG_LASTNAME, LONG_FIRSTNAME	Sample Date:	01-May-1910	John Doe	
Patient ID:	PATID	Report Date:	11-Jul-2025	BC Cfe Clinic	
Secondary ID:	THEPHN	Request Date (PRRT):	01-Apr-1980	608-1081 Burrard Street	
Birthdate:	01-Apr-1900	Request Date (INT):	01-Apr-1980	Vancouver BC V6Z 1Y6	
		Sample ID (PRRT):	TEST39-DRT	Jane Dough (Clinic B)	
		Sample ID (INT):	TEST39-INT	James Baker (Clinic C)	
		Subtype:	B (PRRT/INT)	Subtype reporting for PRRT and INT	

NRTI/NtRTI	IC50 ¹	Cut-off ²		Resistance ³
Zidovudine	0.7	1.5	11.4	Susceptible
Lamivudine	67.1	2.1	4.6	Resistant
Didanosine	1.5	0.9	2.6	Reduced Response
Stavudine	0.9	1.0	2.3	Susceptible
Abacavir	1.4	0.9	3.5	Reduced Response
Emtricitabine	39.5	3.1		Resistant
Tenofovir	0.5	1.0	2.3	Susceptible
Key Mutations ⁴ : 184I				

Protease	IC50 ¹	Cut-off ²		Resistance ³
Indinavir/r	0.7	2.3	27.2	Susceptible
Nelfinavir	0.7	2.2	9.4	Susceptible
Saquinavir/r	0.7	3.1	22.6	Susceptible
Fosamprenavir/r	0.7	1.5	19.5	Susceptible
Lopinavir/r	0.8	6.1	51.2	Susceptible
Atazanavir/r	0.7	2.5	32.5	Susceptible
Tipranavir/r	0.8	1.5	7.0	Susceptible
Darunavir/r	0.6	10.0	106.9	Susceptible
Key Mutations ⁴ : None Detected.				

NNRTI	IC50 ¹	Cut-off ²		Resistance ³
Nevirapine	3.6	6.0		Susceptible
Efavirenz	2.8	3.3		Susceptible
Etravirine	1.7	3.2	27.6	Susceptible
Rilpivirine	1.7	3.1		Susceptible
Doravirine ⁵	N/A	N/A		Susceptible
Key Mutations ⁴ : 90I, 108I/V				

Integrase	Resistance ⁵
Raltegravir	Reduced Response
Elvitegravir	Reduced Response
Dolutegravir	Reduced Response
Bictegravir	Reduced Response
Cabotegravir	Resistant
Key Mutations ⁴ : 263K/R	

Comments/Notes	
TEST39-DRT/TEST39-INT:	Any important comments/notes about specimens, testing procedure or result interpretation will be noted here.

INT Resistance nomenclature updated to be consistent with all other classes:
Red: "High-level Resistance" is now reported as "Resistant"
Yellow: "Low-Level Resistance" and "Intermediate Resistance" are now reported as "Reduced Response"

Approved by

Approval date

HIV Protease, Reverse Transcriptase (PRRT) and Integrase (INT) were amplified by RT-PCR from nucleic acid extracted from human plasma. Amplified products were analyzed by Sanger sequencing at the BC-Cfe St. Paul's Hospital Site. Minority species present at >17.5% frequency after amplification were reported.
1: Predicted Fold Change in 50% Inhibitory Concentration (IC50), relative to susceptible reference virus based on a large database of genotypes and phenotypes (Version CFE-5.0).
2: Cut-off values for maximal and minimal clinical response (Clinical Cut-Off) or for normal susceptibility range in vitro (Biological Cut-Off). Biological Cut-Offs are printed in italic.
3: Resistance Analysis based on the magnitude of the Fold Change relative to the Clinical or the Biological Cut-Offs.
4: Mutations indicated are those reported on public lists (ANRS, Stanford, IAS-USA) or by drug development sponsors.
5: Resistance analysis is based on the Stanford HIVDB Algorithm Version 8.9-1. Resistance Analysis categories are defined as follows: 'Susceptible': HIVdb Score 0-14; 'Reduced Response': HIVdb Score 15-59; 'Resistant': HIVdb Score >=60. N/A: no information available.
This test was developed and its performance characteristics determined by the BC-Cfe Laboratory.
This test is validated for testing specimens with HIV-1 viral loads >=250 copies/mL and should be interpreted only on such specimens. The BC-Cfe Laboratory is accredited by the Diagnostic Accreditation Program of the College of Physicians and Surgeons of British Columbia and the College of American Pathologists to perform this testing. This test is used for clinical purposes.
For more information on this test, these results and their interpretation, or to suggest how to improve this report, please contact the lab at (800) 517-1119 or email lab@bccfe.ca.