INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

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Review Paper

Analytical Profiling of The Dolutegravir–Lamivudine Antiretroviral Combination: A Systematic Review

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ARTICLE INFO

Published: 27 Apr 2026
Keywords:
Dolutegravir, Lamivudine, Dovato®, Antiretroviral therapy, HIV, UV spectrophotometry, RP-HPLC, HPTLC, LC-MS/MS, Analytical method validation, ICH Q2(R1)
DOI:
10.5281/zenodo.19814724

ABSTRACT

Dolutegravir (DTG), an integrase strand transfer inhibitor, and Lamivudine (3TC), a nucleoside reverse transcriptase inhibitor, constitute the once-daily fixed-dose combination marketed as Dovato® for the management of human immunodeficiency virus (HIV-1 and HIV-2) infection in adults. The growing clinical relevance of this dual antiretroviral regimen necessitates robust, sensitive, and validated analytical methods for their accurate quantification in pharmaceutical formulations and biological matrices. This review comprehensively summarizes the qualitative and quantitative analytical techniques reported in the literature for the individual and simultaneous determination of dolutegravir and lamivudine. Qualitative techniques discussed include thin-layer chromatography (TLC), high-performance thin-layer chromatography with densitometry (HPTLC), micellar electrokinetic chromatography (MEKC), capillary electrophoresis (CE), and X-ray powder diffractometry (XRPD). Quantitative methods encompass UV-Visible spectrophotometry (including derivative spectroscopy), high-performance thin-layer chromatography (HPTLC), reverse-phase high-performance liquid chromatography (RP-HPLC), and liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS). A total of 54 published methods are critically reviewed, covering a wide range of matrices including bulk drug substance, tablet dosage forms, and human plasma. Chromatographic parameters such as stationary phase, mobile phase composition, detection wavelength, retention time, linearity range, and percentage relative standard deviation (%RSD) are tabulated for comparative evaluation. Most reported methods comply with ICH Q2(R1) guidelines for analytical method validation, demonstrating acceptable linearity, precision, accuracy, specificity, and robustness. This review aims to serve as a consolidated reference for researchers

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

and analysts engaged in the quality control, pharmacokinetic monitoring, and stability assessment of dolutegravir and lamivudine in pharmaceutical and clinical settings.

INTRODUCTION

Dolutegravir and Lamivudine is a combination antiviral medicine used to treat human immunodeficiency virus (HIV), the virus that can cause acquired immunodeficiency syndrome (AIDS). Dolutegravir and Lamivudine is not a cure for HIV or AIDS [1]. Sold under the brand name Dovato, it contains dolutegravir, an integrase inhibitor, and lamivudine, a nucleoside reverse-transcriptase inhibitor [2].

Dovato is a prescription medicine approved by the U.S. Food and Drug Administration (FDA) for the treatment of HIV infection in adults who meet certain requirements, as determined by a healthcare provider. Dovato is a complete HIV treatment regimen and should not be used with other HIV medicines [3].

Dolutegravir is chemically designated as Isopropyl (4R,12aS)-N-(2,4-difluorobenzyl)-7-hydroxy-4-methyl-6,8-dioxo-3,4,6,8,12,12a-hexahydro-2H-pyrido[1',2':4,5] pyrazino[2,1-b][1,3] oxazine-9-carboxamide. Its molecular formula is $C_{20}H_{19}F_2N_3O_5$, with a molecular weight of 419.38 g/mol [4].

Dolutegravir is an integrase strand transfer inhibitor active against HIV type 1, with some in vitro activity against HIV type 2. It blocks the strand transfer step of viral genome integration into the host cell, thereby preventing HIV replication and lowering the amount of HIV in the blood [5]. Its mechanism has no homology in human host cells, which gives it excellent tolerability and minimal toxicity. Common side effects in clinical trials included insomnia and headache; serious side effects included allergic reactions and abnormal liver function in patients co-infected with hepatitis B or C [6].

Lamivudine is chemically designated as 4-Amino-1-[(2R,5S)-2-(hydroxymethyl)-1,3-oxathiolan-5-yl]-1,2-dihydropyrimidin-2-one. Its molecular formula is $C_8H_{11}N_3O_3S$, and its molecular weight is 229.26 g/mol.

Lamivudine (commonly called 3TC) is an antiretroviral medication used to prevent and treat HIV/AIDS, and is also used to treat chronic hepatitis B when other options are not possible. It is effective against both HIV-1 and HIV-2 [7]. Common side effects include nausea, diarrhea, headaches, fatigue, and cough. Serious side effects include liver disease, lactic acidosis, and worsening hepatitis B among those already infected [8]. The dual regimen of lamivudine and dolutegravir, administered once daily, maintains virological efficacy up to 24 weeks and is associated with improvements in immunologic and metabolic status [9].

This review summarizes various qualitative and quantitative analytical methods used for the estimation of dolutegravir and lamivudine.

2. QUALITATIVE ANALYTICAL TECHNIQUES

Qualitative analysis is performed to establish the composition of natural or synthetic substances. These tests indicate whether a specific substance or compound is present in a sample. Various qualitative tests include detection of evolved gas, formation of precipitates, limit tests, colour change reactions, determination of melting and boiling points, solubility, refractive index, and chromatographic techniques using reference standards.

2.1. Thin-Layer Chromatography (TLC)

TLC has been applied for the transfer of a method for the antiviral drug lamivudine (as described in Minilab Volume II, 2006, Method 6.21, pp. 112–115) and for the development of HPTLC-densitometry methods for coformulated antiviral

drugs dolutegravir and tenofovir disoproxil fumarate. Lamivudine and TDF are simultaneously analyzed on one plate by scanning their separated fluorescence quenching bands at 254 nm, while dolutegravir is analyzed on a second plate by scanning absorbance at 366 nm.

Lamivudine was analyzed simultaneously with TDF on Merck Premium Purity silica gel 60 F plates using the mobile phase ethyl acetate–methanol–acetone–concentrated ammonium hydroxide (30:7:3:1) and densitometric scanning at 254 nm. Dolutegravir was analyzed on a second plate by scanning at 366 nm after chromatography with the chloroform–methanol–formic acid (32:8:2) mobile phase. Mobile phases were developed in a mobile-phase-vapor-saturated CAMAG twin trough chamber. Automated HPTLC-densitometry was performed using a CAMAG Scanner 3 controlled by winCATS software, with 4.00 mm × 0.45 mm micro slit dimensions and a 20 mm/s scan rate. L and TDF quenched fluorescence of a phosphor indicator in the silica gel layer and were scanned under 254 nm UV light from a deuterium lamp, while absorbance of dolutegravir was scanned under 366 nm UV light from a mercury lamp [10].

2.2. Electrophoresis Techniques

Electrophoresis techniques are particularly applicable to dolutegravir and lamivudine. A simple, specific, and cost-effective micellar electrokinetic chromatographic (MEKC) method has been developed for the simultaneous separation and determination of the nucleoside reverse transcriptase inhibitors (NRTIs) lamivudine (3TC) and stavudine (d4T), along with the non-nucleoside reverse transcriptase inhibitor (NNRTI) nevirapine (NVP). The method used an uncoated fused-silica capillary (length 73.5 cm, effective length 62 cm) as the stationary phase, with 10 mM sodium tetraborate, 100 mM sodium dodecyl sulfate (SDS) and 15% (v/v) 2-propanol as solvent. All analytes were separated within 14 min at a voltage of +20 kV [11].

Electrokinetic chromatography methods have also been developed for the separation and quantitative analysis of anti-HIV drug mixtures containing lamivudine (3TC), didanosine (ddI), and saquinavir in human serum, using an uncoated fused-silica capillary (length 52 cm, internal diameter 50 µm) with diltiazem as an internal standard. Detection was at 210 nm with a voltage of +20 kV [12].

2.3. X-Ray Powder Diffractometry (XRPD)

X-ray powder diffraction (XRD) is a rapid analytical technique primarily used for phase identification of a crystalline material and can provide information on unit cell dimensions [13]. Kommavarapu et al. [14] published an X-ray procedure for the identification and determination of the degree of crystallinity in abacavir, lamivudine, and nevirapine drug products.

3. QUANTITATIVE ANALYTICAL TECHNIQUES

Analytical techniques for quantitative analysis help an analyst to accurately determine the concentration of individual components in a test sample. Classical quantitative analysis uses mass or volume changes to quantify amounts. Quantitative instrumental methods include chromatography, field-flow fractionation, and electrophoresis for separation; and physical properties such as absorption, fluorescence, conductivity, and light scattering for precise measurement of analytes [15].

3.1. UV Spectroscopy

A simple, rapid, precise, and accurate spectrophotometric method has been developed for quantitative analysis of dolutegravir and lamivudine in active pharmaceutical ingredients (API) or their dosage forms, either alone or in

combination with other active components [16]. All spectroscopic methods for the determination of dolutegravir and lamivudine are summarized in Table 1.

A UV spectroscopic method for the estimation of dolutegravir in bulk and formulation was proposed by Vaishnavi et al. [17] using methanol as the solvent. Samples were scanned and analyzed at 254 nm, with linearity over 10–50 µg/mL. Similarly, Naveen et al. [18] reported a validated UV spectrophotometric method with methanol as solvent and absorbance measured at 260 nm, with linearity between 5–40 µg/mL.

A UV spectrophotometric method for lamivudine in API and tablet formulations was proposed by Anandakumar et al. [19] using distilled water as solvent at 271 nm (linearity: 5–40 µg/mL). Sonar et al. [20] estimated lamivudine in tablets at 268 nm with linearity at 6–14 µg/mL. Mohammed et al. [21] reported a UV spectrophotometric method for lamivudine and tenofovir in pharmaceutical dosage forms at 271 nm and 260 nm, respectively, both with linearity of 10–60 µg/mL.

Nagulwar et al. [22] simultaneously estimated lamivudine, nevirapine, and zidovudine in combined tablet dosage forms using UV derivative spectroscopy at 280.2 nm, 312 nm, and 266.8 nm, respectively, with linearity ranges of 5–25 µg/mL, 5–50 µg/mL, and 5–40 µg/mL. Elvis et al. [23] reported assay of lamivudine in API and tablet formulations based on UV absorbance at 270 nm, with linearity of 5–15 µg/mL.

Table 1: UV Spectroscopy Methods for Dolutegravir and Lamivudine

Sr.No.	Drugs	Solvent	Detection (nm)	Linearity (µg/mL)	Formulation	Ref
1	Dolutegravir	Methanol	254	10–50	Bulk	17
2	Dolutegravir	Methanol	260	5–40	Bulk	18
3	Lamivudine	Distilled water	271	5–40	Bulk	19
4	Lamivudine	Methanol	268	6–14	Tablet	20
5	Lamivudine and Tenofovir	Distilled water	271 / 260	10–60 / 10–60	Tablet	21
6	Lamivudine, Nevirapine and Zidovudine	Water	280.2 / 312 / 266.8	5–25 / 5–50 / 5–40	Tablet	22
7	Lamivudine	Methanol	270	5–15	Tablet	23

3.2. High-Performance Thin Layer Chromatography (HPTLC)

High-Performance Thin Layer Chromatography (HPTLC) is a simple, fast, and inexpensive chromatographic separation technique used to identify compounds based on Rf values, and is useful for monitoring reaction completion in synthetic laboratories.

Venkatesh et al. [24] published a study on lamivudine and zidovudine in combined tablet dosage forms using HPTLC. Chromatograms were developed using toluene:ethyl acetate:methanol (4:4:2 v/v/v) mobile phase on pre-coated silica gel GF aluminium TLC plates, quantified by densitometric absorbance at 276 nm. The Rf values were 0.41 ± 0.03 and 0.60 ± 0.04 for lamivudine and zidovudine, respectively. Similarly, Sudha et al. [25] reported simultaneous determination of lamivudine and abacavir sulphate in combined tablet dosage forms using acetone:chloroform:methanol (4:4:2 v/v/v) mobile

phase on aluminium plates precoated with silica gel 60F254, detected at 265 nm.

3.3. High-Performance Liquid Chromatography (HPLC)

High Performance Liquid Chromatography (HPLC) is one of the most accurate methods widely used for quantitative and qualitative analysis of drug products, and for determining drug product stability. HPLC is an analytical tool that can detect, separate, and quantify drugs, their impurities, and drug-related degradants that may form during synthesis or storage. All HPLC methods for the determination of dolutegravir and lamivudine are summarized in Table 2.

The RP-HPLC method for determination of dolutegravir was proposed by Venkatnarayana et al. [26] using 0.1% trifluoroacetic acid and water (50:50 v/v) mobile phase on a C8 column, UV-Vis detection at 240 nm, flow rate of 1.0 mL/min, and a retention time of 7.40 min. A stability-indicating RP-HPLC method for simultaneous quantification of dolutegravir and lamivudine was presented by Noorbasha et al. [27] using phosphate buffer pH 3.0, acetonitrile, and methanol (50:20:30 v/v/v) on an Inertsil ODS 3V column, detected at 257 nm. Retention times were 6.36 min for dolutegravir and 2.16 min for lamivudine.

Godela et al. [28] reported an RP-HPLC method for dolutegravir and lamivudine using methanol and buffer (85:15 v/v) on an Xbridge Phenyl column at 258 nm, with retention times of 5.0 min and 3.4 min, respectively. Dhanwate et al. [29] used buffer pH 3, acetonitrile, and methanol (55:35:10 v/v/v) on a C18 column at 260 nm, with retention times of 15 min for dolutegravir and 5 min for lamivudine. Bhavar et al. [30] developed an RP-HPLC method for dolutegravir sodium using acetonitrile and water (80:20 v/v) on an ODS C18 column at 260 nm.

Naveen et al. [31] presented an RP-HPLC method for dolutegravir and rilpivirine in bulk and plasma using 0.1% orthophosphoric acid and acetonitrile (60:40 v/v) on a Phenomenex C18 column at 262 nm. A stability-indicating method for the same combination was reported by Ismail et al. [32] using phosphate buffer pH 3.5 and acetonitrile (45:55 v/v) on a Thermosil C18 column at 260 nm, and by Kanchipogu et al. [33] using 0.1% OPA and acetonitrile (50:50 v/v) on a Waters X-Bridge C18 column at 245 nm.

Sindu Priya et al. [34] reported a stability-indicating method for simultaneous determination of abacavir, dolutegravir, and lamivudine by RP-HPLC on a Kinetex 5µ C18 100A column at 258 nm. Pal et al. [35] used buffer and acetonitrile (65:35 v/v) on a Non-Polar Kromasil column at 257 nm. Mallikarjuna Rao et al. [36] described a stability-indicating HPLC method for lamivudine, tenofovir, and dolutegravir on a C18 RP column at 260 nm. Kanawade et al. [37] estimated the same three-drug combination using Luna C8 column at 260 nm, and Saravanan et al. [38] used a Symmetry C18 column at 260 nm.

Additional HPLC methods have been reported for lamivudine alone and in combination. Hefnawy et al. [39] used a Monolithic Column at 285 nm. Singh et al. [40] estimated lamivudine in rabbit plasma using a Hypersil BDS C18 column at 256 nm. Uslu et al. [41] and Sivasubramanian et al. [42] reported methods for lamivudine and zidovudine. Singh et al. [43] simultaneously estimated lamivudine and raltegravir. Jayaseelan et al. [44] and Hariprasad et al. [45] reported methods for lamivudine and stavudine. Diwan et al. [46] and Gorja et al. [47] reported methods for lamivudine with efavirenz and tenofovir, respectively. Rajkumar et al. [48] reported a method for lamivudine, abacavir, and dolutegravir.

Table 2: RP-HPLC Methods for Dolutegravir and Lamivudine

Sr. no	Drugs	Mobile phase	Stationary phase	Flow rate (mL/min)	Detection (nm)	Retention time (min)	Formulation	%RSD	Ref
1	Dolutegravir	0.1% TFA: Water	C8 Column (150×4.6mm, 5µm)	1.0	240	7.40	Drug substance (API)	0.85	26
2	Dolutegravir and Lamivudine	Phosphate buffer pH 3.0: acetonitrile: methanol	Inertsil ODS 3V C18 (250×4.6mm, 5µ)	1.0	257	DTG-6.36 3TC-2.16	Bulk	DTG-0.8 3TC-0.7	27
3	Dolutegravir and Lamivudine	Methanol:Buffer (0.1% TEA in water) (85:15 v/v)	Xbridge Phenyl Column (250×4.6mm, 5µ)	0.8	258	DTG-5.0 3TC-3.4	Bulk and Tablet	DTG-0.65 3TC-0.75	28
4	Dolutegravir sodium and Lamivudine	Buffer pH 3: Acetonitrile: Methanol (55:35:10 v/v/v)	C18 Column (150×4.6mm, 5µ)	1	260	DTG-15 3TC-5	Tablet	DTG-0.47 3TC-0.48	29
5	Dolutegravir sodium	Acetonitrile: Water pH 7.5 (80:20 v/v)	ODS C18 Column (150×4.6mm, 5µm)	1	260	3.0	Bulk	0.66	30
6	Dolutegravir and Rilpivirine	0.1% OPA: Acetonitrile (60:40 v/v)	Phenomenex C18 (150×4.6mm, 5µm)	1	262	DTG-4.35 RPV-7.73	Bulk and Plasma	DTG-0.15 RPV-0.26	31
7	Dolutegravir and Rilpivirine	Acetonitrile: Phosphate buffer pH 3.5 (45:55 v/v)	Thermosil C18 (150×4.6mm, 5µm)	0.8	260	DTG-2.42 RPV-4.43	Bulk	DTG-0.09 RPV-0.84	32
8	Dolutegravir and Rilpivirine	0.1% OPA: Acetonitrile (50:50 v/v)	Waters X-Bridge C18 (150×4.6mm, 5µ)	1.0	245	DTG-3.41 RPV-3.41	Tablet	DTG-0.81 RPV-0.95	33
9	Dolutegravir, Abacavir and Lamivudine	Acetonitrile: Water	Kinetex 5µ C18 100A (250×4.6mm)	1	258	DTG-8.4 ABC-5.2 3TC-3.1	Bulk	DTG-0.22 ABC-0.72 3TC-0.79	34
10	Dolutegravir, Abacavir and Lamivudine	Buffer: Acetonitrile (65:35 v/v)	Non-Polar Kromasil Column (250×4.6mm, 5µm)	1	257	DTG-9.63 ABC-2.73 3TC-2.25	Tablet	DTG-0.6 ABC-0.4 3TC-0.4	35

Sr. no	Drugs	Mobile phase	Stationary phase	Flow rate (mL/min)	Detection (nm)	Retention time (min)	Formulation	%RSD	Ref
11	Dolutegravir, Tenofovir and Lamivudine	0.05M Phosphate buffer pH 6.2: KOH: Acetonitrile	C18 RP Column (250×4.6mm, 5µ)	1	260	DTG-11.5 TDF-5.2 3TC-2.8	Bulk and Tablet	DTG-0.29 TDF-0.12 3TC-0.16	36
12	Dolutegravir, Tenofovir disproxil and Lamivudine	0.1% TFA in water: Acetonitrile	Luna C8 Column (150×4.6mm)	1.0	260	DTG-7.67 TDF-5.33 3TC-2.03	Bulk and Tablet	—	37
13	Dolutegravir sodium, Lamivudine and Tenofovir disproxil fumarate	Acetonitrile: Methanol	Symmetry C18 Column (250×4.6mm, 5µm)	1.0	260	DTG-11.0 3TC-5.2 TDF-13.0	Tablet	DTG-0.3 3TC-0.3 TDF-0.6	38
14	Lamivudine	Acetonitrile: Water (65:35 v/v)	Monolithic Column (100×4.6mm)	2.0	285	0.4	Tablet	1.14	39
15	Lamivudine	0.25% TEA buffer pH 3.0: Acetonitrile (70:30 v/v)	Hypersil BDS C18 (250×4.6mm, 5µm)	1.0	256	8.78	Plasma	7.4	40
16	Lamivudine and Zidovudine	Methanol: Water: Acetonitrile (70:20:10 v/v/v)	C18 RP Column	0.9	265	3TC-2.06 AZT-3.36	Binary mixture	3TC-0.98 AZT-0.62	41
17	Lamivudine and Zidovudine	Buffer: Acetonitrile (55:45 v/v)	X Terra C18 (150×4.6mm, 5µm)	0.5	271	3TC-3.55 AZT-5.36	Tablet	3TC-1.63 AZT-1.81	42
18	Lamivudine and Raltegravir	Methanol: Acetonitrile: Phosphate buffer pH 3.0 (75:15:10 v/v/v)	Phenomenex C18 (150×4.6mm, 5µ)	1.2	254	3TC-3.13 RAL-7.27	Binary mixture	3TC-1.57 RAL-0.27	43
19	Lamivudine and Stavudine	Methanol: Water (80:20 v/v)	RP C18 Symmetry Column	1.5	266	3TC-4.28 D4T-7.48	Tablet	3TC-0.25 D4T-0.68	44

Sr. no	Drugs	Mobile phase	Stationary phase	Flow rate (mL/min)	Detection (nm)	Retention time (min)	Formulation	%RSD	Ref
20	Lamivudine and Stavudine	Methanol: Acetonitrile: 0.05M Phosphate buffer (60:20:20 v/v/v)	Grace Smart RP18 C18 (250×4.6mm, 5µm)	1.0	254	3TC-2.50 D4T-4.25	Tablet	3TC-0.50 D4T-0.21	45
21	Lamivudine and Efavirenz	0.1% TEA: Acetonitrile (30:70 v/v)	Phenomenex Luna 5µ C18 (250×4.6mm)	1.0	245	3TC-2.27 EFV-7.26	Tablet	3TC-0.09 EFV-0.71	46
22	Lamivudine and Tenofovir disproxil fumarate	KH2PO4 Buffer: Methanol: Water (33:65:2 v/v/v)	Thermosil C18 (150×4.6mm, 3.5µm)	0.8	260	3TC-2.3 TDF-3.4	Tablet	3TC-0.39 TDF-0.36	47
23	Lamivudine, Abacavir and Dolutegravir	Buffer: Acetonitrile: Methanol (50:20:30 v/v/v)	Inertsil ODS (250×4.6mm, 5µm)	1.0	255	3TC-2.2 ABC-2.9 DTG-7.4	Tablet	3TC-0.5 ABC-0.3 DTG-1.1	48
24	Lamivudine, Abacavir and Zidovudine	Methanol: Water: Phosphate buffer pH 5.65 (80:10:10 v/v/v)	Zorbax C18 (150×4.6mm, 5µm)	0.6	257	3TC-2.52 ABC-2.90 AZT-6.52	Tablet and Plasma	3TC-0.90 ABC-0.89 AZT-0.17	49
25	Lamivudine, Zidovudine and Abacavir	0.01M KH2PO4 pH 3.0: Methanol (45:55 v/v)	HIQ Sil C18 V (250×4.6mm, 5µ)	0.8	272	3TC-3.8 AZT-8.1 ABC-6.3	Tablet	3TC-0.42 AZT-0.27 ABC-0.20	50
26	Lamivudine, Tenofovir disproxil fumarate and Efavirenz	Acetonitrile: Methanol: Water (30:45:25 v/v/v)	Phenomenex Luna C18 (250×4.6mm, 5µm)	0.5	258	3TC-3.27 TDF-4.58 EFV-10.90	Bulk and Tablet	3TC-0.86 TDF-0.62 EFV-0.92	51
27	Lamivudine, Tenofovir disproxil fumarate and Efavirenz	Methanol: Phosphate buffer pH 5.0 (70:30 v/v)	Kromasil C18 (150×4.6mm, 5µm)	1	254	3TC-2.76 TDF-3.96 EFV-10.5	Tablet	3TC-0.18 TDF-0.31 EFV-0.28	52

Sr. no	Drugs	Mobile phase	Stationary phase	Flow rate (mL/ min)	Detection (nm)	Retention time (min)	Formulation	%RSD	Ref
28	Stavudine, Lamivudine and Nevirapine	Sodium Phosphate buffer: Acetonitrile (4:1 v/v)	C18 ODS Hypersil (250×4.6mm, 5µm)	0.4	266	D4T-2.85 3TC-4.33 NVP-8.39	Tablet	D4T-0.10 3TC-0.12 NVP-0.13	53

3.4. Liquid Chromatography–Mass Spectrometry (LC-MS)

Bhadru et al. [54] used a liquid chromatography–mass spectrometry–mass spectrometry (LC-MS/MS) method for simultaneous determination of dolutegravir and lamivudine in human plasma using 0.1% formic acid buffer and acetonitrile as solvents. The run time was 1.06 min and 1.84 min, with linearity ranges of 0.10–30.0 ng/mL and 20.2–6026 ng/mL for dolutegravir and lamivudine, respectively.

CONCLUSION

Dolutegravir and lamivudine are important antiretroviral drugs used in the management of HIV/AIDS. This review summarizes the analytical detection techniques used to identify and quantify dolutegravir and lamivudine, either alone or in combination. Spectroscopic and RP-HPLC methods are widely applied to measure the activity of these drugs in pharmaceutical dosage forms. All reviewed techniques can be applied precisely for the estimation of dolutegravir and lamivudine. In addition to these primary analytical approaches, the drugs can also be evaluated using HPTLC, IR spectroscopy, and LC-MS/MS. The compiled data provided in this review may serve as a reference for researchers engaged in the analysis of dolutegravir and lamivudine. There remains scope for the development of new, selective, and specific analytical techniques for quantifying these drugs in complex biological and pharmaceutical matrices.

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HOW TO CITE: Mona Kaushal, Jigna Bhatt, Nilam Joshi, Krunal Detholia, Analytical Profiling of The Dolutegravir–Lamivudine Antiretroviral Combination: A Systematic Review, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 4, 4580-4591, https://doi.org/10.5281/zenodo.19814724