Publications Template

#	Research Title	Field	Abstract	Year of Publication Publishing	Publishing Link "URL"
1	RGB Trichromatic Whiteness Assessment of Bio Analytical Chromatographic Tool Using Fluorescence for Quantitation of Semaglutide: Application to Pharmaceutical Preparations and Spiked Plasma	Pharmaceutical Analytical Chemistry	Semaglutide (SEMG) is one of the most widely used and trending medications to treat type II diabetes and obesity. This work aimed to develop a liquid chromatography with spectroflourimetric detection (HPLC-flourimetry) analysis of SEMG in both its tablet dosage form and plasma. The power of fluorescence detection coupled with HPLC proved its capability as a bioanalytical tool to assay SEMG in plasma samples owing to its simplicity and sensitivity which reached below the Cmax of SEMG. Separation was done using a C18 column with mobile phase of acetonitrile and water acidified with orthophosphoric acid (pH 3.5) (1.41 × 10–5 M) in isocratic mode in ratio 57:43 and 1 mL/min flow rate after extraction using protein precipitation. Detection was carried out at λ excitation of 238 nm and λ emission of 416 and 307 nm for SEMG and the internal standard, respectively. Evaluation of greenness of the proposed method was done using AGREE (Analytical GREEnness Metric Approach), ComplexGAPI (Complementary Green Analytical Procedure Index) & the new algorithm RGB 12 model (Red–Green–Blue). They showed that these methods can be a greener alternative with acceptable sensitivity for analysis of SEMG. The developed seven min-assay was validated per ICH as well as FDA bio analytical methods' guidelines to prove its applicability for routine sample analysis and future pharmacokinetic studies.	2024	https://doi.org/10.1007/s10895-024-03954-9

2	Chromatographic assay of recently approved co-formulation of Vonoprazan fumarate with low dose Aspirin: AGREE, Complex MoGAPI, and RGB 12-model assessments	Pharmaceutical Analytical Chemistry	Two simple, valid and green chromatographic based techniques are developed in the present work for first time to simultaneously analyze the recently approved combination of Aspirin (ASP) with the novel gastro-protective agent Vonoprazan (VON). First method is an HPLC-DAD "diode array detection", where separation was successful using C18 (250 × 4.6 mm) column with isocratic elution of phosphate buffer-pH 6.8 and acetonitrile in ratio of 63:37 with detection at 230 nm. Second method is an HPTLC method on HPTLC silica plates using ethyl acetate: ethanol (75%): ammonia (5:5:0.05 v/v) mobile phase followed by densitometric scanning at 230 nm. The methods were applied successfully for analysis of VON and ASP mixture in laboratory-prepared tablets and the methods were validated in regards to linearity, precision, accuracy and selectivity. The proposed methods are assessed for their greenness and whiteness as well using the "Analytical GREEnness Metric Approach", "Complementary Modified Green Analytical Procedure Index" and the new algorithm "RGB 12 model" (Red-Green-Blue) and proved the greenness and the sustainability of the methods in the routine assay of the newly marketed formulation.	2024	https://doi.org/10.1186/s13065-024-01344-7
3	Simultaneous Spectrophotometric & Spectrofluorimetric Assay of Silodosin & Solifenacin in their Co-formulated Binary Mixture	Pharmaceutical Analytical Chemistry	Objectives: New pharmaceutical combinations are routinely developed and marketed to improve treatment of different conditions, increase patient compliance and simplify the medication regimen. However, such case necessities the development of analytical procedures to assay these new mixtures in different matrices. This is the case for Silodosin (SI) & Solifenacin (SO) new combination marketed to treat patients' stent-related symptoms and urological disorders. The simplest and greenest known analytical methods are the spectrophotometric and spectrofluorimetric ones. Thus, these two techniques were chosen to resolve this new binary mixture and assay the drugs in their bulk and dosage form to be routine methods for their analysis. Methods: Method I relies on applying third derivative treatment on the two drugs' absorption spectra to measure SI at 280 nm and SO at 222 nm. Method II is direct spectofluorimetric measurement of SI at its λ_{em} of 445 nm and SO at λ_{em} of 276 nm. Results: The methods are validated according to "ICH guidelines" to be the first valid reported methods for this new mixture. Linearity was achieved at 6.50-19.20 & 2.50-10.00 µg/mL for SI and SO, respectively, in case of method I and at 0.30-12.80 & 1.00-22.00 µg/mL for SI and SO, respectively, in case of method II. The two proposed methods showed high sensitivity, accuracy and selectivity for each drug. Conclusion: The methods in this	2023	DOI: 10.21608/aprh.2022.161245.1191

			study were applied successfully to determine SI and SO in their bulk and laboratory prepared tablets with acceptable validation parameters.		
4	Green novel photometric and planar chromatographic assays of remdesivir: Comparative greenness assessment study using estimated GAPI tool versus ISO technical reported methods	Pharmaceutical Analytical Chemistry	Green assessment of analytical procedures has become an environmental obligation in equivalence to their International Council of Harmonization analytical validation obligation. Worldwide awareness of our planet and ecological hazards have raised the shades of green and sustainable chemistry in pure or formulated API assays. The Green Analytical Procedure Index (GAPI) is instant five pentagrams for evaluating the greenness of each step in the developed analytical procedure, in discriminative colors: green, yellow, and red. In the present study, GAPI is applied to assess three novel direct analytical methods: spectrophotometric, fluorimetric, and high-performance thin-layer chromatography (HPTLC) for remdesivir (RDV) quantitation, both in bulk and pharmaceutical vials. Furthermore, a comparative green level calculated GAPI study has been assembled for the proposed methods versus the previously reported methods, for RDV assay, of similar techniques. Spectrophotometric direct *A*max method at 240 nm, fluorimetric emission at 404 nm upon excitation at 275 nm as well as the HPTLC densitometric measurement using ethanol and distilled water (7:3, v/v) as mobile phase, all three methodologies are developed, optimized, and fully validated for RDV quantitation. They have been applied to assay RDV pharmaceutical vials and results are compared together with a one-way ANOVA test. Satisfactory recoveries and nano-	2023	https://doi.org/10.1515/revac-2023-0060

			level sensitivities in addition to the least standard deviations encourage the use of developed methods for routine analysis in quality control laboratories. Their promising greenness profile satisfies the beliefs of ecological sustainability of Green Agenda 2030.		
5	Simple Green Spectrophotometric & Chromatographic Assay of the Oral Antiviral Treatment of COVID-19: Molnupiravir-EIDD-2801	Pharmaceutical Analytical Chemistry	Although vaccination for "Coronavirus disease 2019" is currently available, effective antiviral therapy is of great importance. The presence of easily administrated oral antivirals was a goal since beginning of the pandemic. The end of 2021 witnessed the emergency use authorization to Merck oral antiviral drug Molnupiravir (MOL). This study presents three analytical procedures to assay MOL in its raw material and dosage form. Method I: direct spectrophotometric measuring at λmax 233 nm using methanol as a solvent. Method II: HPTLC method, using methanol and glacial acetic acid as mobile phase followed by densitometric scanning of MOL bands at its λmax. Method III: RP-HPLC-DAD procedure, where MOL is separated only in 5 minutes, using isocratic elution of acetonitrile and distilled water acidified with orthophosphoric acid (pH 3) with ratio 87:13 (flow rate 1 mL/min.). The DAD detection was done also at 233 nm. These methods were validated to be ready for MOL rapid quality control assay in its fast massive production with good linearity correlation coefficients in ranges of 2.5-20 µg/mL, 0.03-0.38 µg/band and 0.025-10 µg/mL, for methods I, II & III, respectively. Limits of detections of 0.53 µg/mL, 0.01 µg/band & 0.005 µg/mL of methods I, II & III, respectively show the proposed methods' sensitivity. In addition, the three methods were applied for assaying MOL in laboratory prepared capsules to prove the methods' selectivity. Finally, the	2023	10.21608/EJCHEM.2022.135659.5976

			greenness of the three proposed methods was assessed & compared to those of the previously reported methods for MOL single assay by AGREE metric for greenness assessment.		
6	Green & Sensitive pH-dependent Spectrofluorimetric Assay of Tamsulosin Hydrochloride and Tadalafil in their New Combined Formulation for Benign Prostatic Hyperplasia: Application to Spiked Human Plasma	Pharmaceutical Analytical Chemistry	Sensitive and green spectrofluorimetric methods were utilized for Tamsulosin Hydrochloride (TAM) and Tadalafil (TDL) assessment in bulk and their newly available combined mixture for benign prostatic hyperplasia and erectile dysfunction. The technique relies on measuring native fluorescence of TAM in 0.1 N HCl at 324 nm and TDL in 0.1 N NaOH at 348 nm due to their different fluorimetric behavior in acidic and basic media where TAM has no fluorescence in basic medium and vice versa. To achieve better regression, the spectra were derivatized allowing determination of TAM at 314 nm and TDL at 320 and 380 nm (peak to peak) by applying third and first derivative, respectively. In addition, pH-dependent "constant-wavelength synchronous" spectrofluorimetry was applied where TAM and TDL were determined at 218 nm in acidic medium and at 268 nm in basic medium, respectively. Finally, derivatizing the latter emission spectra allowed determination of TAM and TDL at 232 nm and at 262 and 278 nm (peak to peak), respectively. Acidic and basic emission spectra where scanned at λ_{exc} = 225 nm (for TAM assay) and at λ_{exc} = 247 nm (for TDL assay), respectively. Fluorescence–concentration plots were linear and the proposed methods were used for analysis of TAM and TDL combined laboratory prepared formulation. These procedures are green, sensitive and of low cost which make them suitable for	2022	https://doi.org/10.1007/s10895-022-02938-x

			quality control analysis of the two drugs. In addition, the high selectivity of the proposed methods was tested by successfully applying them for TAM and TDL assay in plasma samples.		
7	Simultaneous determination of dantrolene with ibuprofen and diclofenac in plasma by HPLC-DAD: Application to comparative pharmacokinetic study	Pharmaceutical Analytical Chemistry	Muscle relaxants and pain killers with their different types are widely used as combination approach for treatment of pain associated with several muscle spasm conditions. A sensitive and simple HPLC-UV detection method was developed in this work for simultaneous assay of Dantrolene (DNT) and co-administrated: Ibuprofen (IBU) and Diclofenac (DIC). After simple protein precipitation, separation was achieved using C_{18} column (150 × 4.6 mm) with a mobile phase of acidified water with orthophosphoric acid (pH = 3.5) and acetonitrile using gradient elution with a flow rate of 1 mL/min. The DAD was adjusted at 380, 219, 280 and 240 nm to measure DNT, IBU, DIC, and dexamethasone (internal standard), respectively. Linearity was demonstrated over the range from 0.1 to 3 µg/mL, 1 to 40 µg/mL, and 0.1 to 2 µg/mL for DNT, IBU, and DIC, respectively. The validated method was applied successfully to compare the effect of co-administration of IBU or DIC on the pharmacokinetic profile of DNT.	2022	https://doi.org/10.1556/1326.2022.01089
8	Comparative Greenness Metric Estimates for Content Uniformity Testing of Anti-Cov-2, GS-5734 in Commercial	Pharmaceutical Analytical Chemistry	Background The antiviral drug GS-5734 remdesivir is a new phosphoramidate prodrug developed initially as a treatment for Ebola virus which then proved to have antiviral properties against other viruses. After clinical trials, it was the first antiviral to be approved by the U.S. Food and Drug Administration in 2020 to treat severe coronavirus (COVID-	2022	https://doi.org/10.1093/jaoacint/qsac001

	Vials: Validated Micellar Electrokinetic Chromatographic Assay		19) cases. The widespread current pandemic gave an urge to its fast production and marketing. Thus, new analytical methods must be available for its analysis in a fast and easy manner with low cost to be applicable in all laboratories. Objective In the current study, a green and economic micellar electrokinetic chromatographic (MEKC) method is proposed for remdesivir analysis. Methods A fused-silica capillary (58.5 cm × 50 µm id, 50 cm effective length) with 20 mM borate buffer (pH 9) and 25 mM sodium dodecyl sulfate was used under a positive potential of 30 kV at 25°C with detection at 245 nm. Results Remdesivir analysis was achieved in approximately 5 min. The method proved to be linear in range of 1–50 µg/mL with correlation coefficient, $r > 0.999$. Conclusion The MEKC method proposed was applied to the analysis of remdesivir in its commercial vials. The method was validated per International Conference on Harmonization guidelines. Highlights Green chemistry has been the focus of the analytical community in the past few years. This method is considered green due to its low energy and solvent consumption without sacrificing the method's sensitivity or selectivity. The method's green profile has been assessed by different greenness assessment scales to ensure the method is eco-friendly and can be used in the pharmaceutical industry.		
9	Accelerated stability study of the ester prodrug remdesivir: Recently FDA-approved Covid-19 antiviral using reversed-phase-HPLC with fluorimetric and diode array detection	Pharmaceutical Analytical Chemistry	Remdesivir (RDV) is the first antiviral drug, approved by the Food and Drug Administration, to treat severe acute respiratory syndrome coronavirus 2. RDV is a relatively new chemical entity, 'ester prodrug', with no reported stability profile. Due to the urgency of its use and thus fast production, it is important to develop a stability-indicating method for its assay. Chromatographic separation was carried out on a C18 column (250 × 4.6 mm, 5 µm) with dual detection: diode array at 240 nm and fluorescence at $\lambda_{ex/em}$ 245/390 nm. Isocratic elution of acetonitrile and distilled water (acidified with phosphoric acid, pH 4) in the ratio of 55:45 (v/v), respectively, was used. The linearity range using HPLC-diode array detection was 0.1–15 µg/mL, whereas that using fluorimetric detection was 0.05–15 µg/mL. As per the International Conference on Harmonization guidelines, RDV has been degraded by accelerated alkaline, acidic, neutral hydrolysis, oxidative, heat, and photolytic stress conditions. Possible degradation hypothesis of the parent molecule has been	2021	https://doi.org/10.1002/bmc.5212

			suggested and illustrated. The proposed methods have achieved selective determination of the intact drug with no peaks overlapping in all assumptions. Extensive degradation confirms threatened drug stability at thermal and basic hydrolytic stressing. The developed methods were fully validated and proved suitable for quality control routine analysis of RDV in raw material and pharmaceutical dosage forms.		
10	HPLC-fluorescence detection for assay of tramadol binary mixtures with ibuprofen or chlorzoxazone in tablets and plasma: Analytical Eco-Scale and GAPI tools for green assessment	Pharmaceutical Analytical Chemistry	Tramadol, a strong pain killer known for its addictive problems is either co-administrated or co-formulated with other analgesics or muscle relaxants. The power of fluorescence detection in HPLC is tested to resolve such mixtures in plasma matrix to reach the required sensitivity with simple sample treatment using just protein precipitation. The aim of this work was to develop an eco-friendly and sensitive HPLC method with fluorimetric detection for analysis of Tramadol in its two binary mixtures with Ibuprofen (mixture 1) and Chlorzoxazone (mixture 2) in two combined dosage forms and spiked plasma. Separation was done using a C_{18} column with mobile phase of acetonitrile and water (pH 3.5) in gradient elution and 1 mL/min flow rate. Detection was carried out with λ excitation/λ emission of 220 and 307 nm, respectively. The method was applied to detect the two binary mixtures in real plasma samples after invivo application to rats, to assure that the drugs' metabolites do not affect the sensitivity or selectivity of the assay. Evaluation of greenness of the proposed method was done using semi-quantitative Eco-Scale and new Green Analytical Procedure Index which showed that this method can be a greener alternative with higher sensitivity for analysis of both mixtures. The method (15 min-assay) was linear over concentrations of 0.1–10 µg/mL and 0.1–33 µg/mL in plasma. In addition, the proposed method was validated per ICH as well as FDA bioanalytical methods' validation guidelines.	2021	https://doi.org/10.1556/1326.2021.00901
11	Rapid sensitive bioscreening of remdesivir in COVID-19 medication: Selective	Pharmaceutical Analytical Chemistry	The widespread coronavirus 2019 (COVID-19) pandemic, attributed to the severe acute respiratory syndrome coronavirus-2, has resulted in global lockdowns and excess mortality. Remdesivir (RM) is the first and only antiviral drug that the US Food and Drug Administration (FDA) has approved so far for COVID-19. The	2021	https://doi.org/10.1515/revac-2021-0141

	drug determination in the presence of six co-administered therapeutics		treatment protocol involves multidrug combinations, basically depending on RM, in addition to antimicrobials, antipyretics, corticosteroids, and anticoagulants. This study develops and validates sensitive and selective RM screening in spiked human plasma in the presence of commonly co-administered drugs. Hydroxychloroquine, azithromycin, paracetamol, dexamethasone, and anticoagulants (rivaroxaban and edoxaban) have been detected simultaneously with RM in the same biological matrix. Separation has been efficiently achieved by simple reversed phase HPLC with dual detectors. Diode array detector and fluorimetric detection have been used to compare their sensitivity and selectivity. Both assays have been validated according to bioanalytical FDA validation parameters. Chromatographic separation and quantitation of RM along with concomitant drugs instantly bioscreen COVID-19 multiple therapy medication in 10 min run time. Furthermore, the proposed *in vitro* study takes the lead for prospective testing of possible drug–drug interactions that alter the pharmacokinetic profiles of drugs.		
12	Green spectrofluorimetric methods for tramadol assay with ibuprofen or chlorzoxazone: comparison of greenness profiles	Pharmaceutical Analytical Chemistry	At this time, green analytical chemistry is gaining more interest and concern. The present work details three green spectrofluorimetric methods for tramadol (TRM) determination using ibuprofen (IBU) (mixture 1) and chlorzoxazone (CLZ) (mixture 2). In first method, two excitation wavelengths (λ_{ex}), 220 and 280 nm, were used to record the emission spectra for IBU and TRM, respectively (mixture 1) followed by a first derivative treatment. For mixture 2, one λ_{ex} (280 nm) was optimum for both drugs followed by a first derivative technique for TRM and a second derivative for CLZ determinations. The second method measured the first derivative values for synchronous spectra using constant-wavelength mode at 280 nm for TRM and 260 nm for IBU, and at 270 nm for TRM and 292 nm for CLZ. The third method used constant-energy mode to record synchronous spectra. First derivative values were computed at 282 nm for TRM and 260 nm for IBU in mixture 1 and at 272 nm for TRM and 292 nm for CLZ in mixture 2. ICH validation guidelines were assessed in full and assay of the two TRM binary mixtures in their drug products was successful. Green profile evaluation for the developed methods compared with the reported chromatographic methods was performed using the 'analytical eco-scale' and the 'green analytical procedure index'. These two assessment tools corroborated that the proposed methods achieved the most green parameters, therefore recommending their use as a green	2021	https://doi.org/10.1002/bio.3969

			option for analyzing the studied drugs in bulk and dosage forms for routine quality control.		
13	Robust Chromatographic Methods for the Analysis of Two Quaternary Mixtures Containing Paracetamol, Codeine, Guaifenesin and Pseudoephedrine or Phenylephrine in their Dosage Forms	Pharmaceutical Analytical Chemistry	Two simple validated and highly selective methods for analysis of paracetamol, codeine, guaifenesin and pseudoephedrine or phenylephrine quaternary mixtures were developed. The first method is a high performance liquid chromatography with diode array detection method where separation was successful using Agilent C18 (150 × 4.6 mm) column, gradient elution of phosphate buffer pH 3, methanol and acetonitrile and diode-array detection at 210 nm. The second method is a HPTLC method followed by densitometric measurement of the spots at 257 nm. Separation was carried out on Merck HPTLC aluminum sheets of silica gel using methylene chloride: methanol: glacial acetic acid: ammonia (17.8: 1.68: 0.4: 0.12, v/v) mobile phase. The methods were applied successfully for analysis of both quaternary mixtures in laboratory-prepared tablets and also validated in regards to linearity, precision, accuracy, sensitivity and stability.	2019	https://doi.org/10.1093/chromsci/bmz057
14	Fourier convolution versus derivative spectrophotometry: Application to the analysis of two binary mixtures containing tamsulosin hydrochloride as a minor component	Pharmaceutical Analytical Chemistry	Simple and rapid spectrophotometric methods are described for determination of two mixtures of tamsulosin (TM), as minor component, with either solifenacin (SL) or tolterodine (TL). The proposed methods involve treatment of the absorbance ratio spectra or zero order spectra by derivative or discrete Fourier function. TM and TL mixture could not be resolved by manipulation of their zero order spectra due to the strong overlap between both spectra and only derivative or Fourier function coefficients of ratio spectra could resolve their spectra. TM and SL mixture was fully resolved by the manipulation of both ratio and zero order spectra. The values of the derivative or the Fourier function coefficients of ratio spectra and/or zero order spectra, at either peak or trough points, were correlated to the concentration of each drug in each mixture. Calibration graphs were linear in ranges 2.5-40 and 30-500 $\mu g.mL^{-1}$ using derivative ratio and Fourier function ratio, 5-40 and 80–600 $\mu g.mL^{-1}$ using direct derivative and 2.5–40 and 30–300 $\mu g.mL^{-1}$ using direct Fourier function for TM and SL, respectively. The plots of derivative ratio amplitude and the Fourier function ratio coefficient versus concentration were linear over ranges 2.5–20 and 25–250 $\mu g.mL^{-1}$ for TM and TL, respectively. Higher sensitivity as indicated by lower values of detection and quantitation limits were obtained using Fourier convoluted spectra (ratio or zero order) compared to derivative methods. All validation aspects per ICH guidelines are included. The	2020	https://doi.org/10.1016/j.pharma.2020.01.003

			proposed methods were also applied for the studied drugs assay in their tablets and capsules.		
15	Novel Validated HPTLC Method for the Analysis of Two Binary Mixtures Containing Tamsulosin Hydrochloride with Antimuscarinic Agents	Pharmaceutical Analytical Chemistry	A validated and selective high-performance thin-layer chromatography (HPTLC) method was developed for the analysis of mixures of tamsulosin hydrochloride (TAM) with either tolterodine tartrate (TOL) or solifenacin succinate (SOL) in bulk drug and in combined dosage forms. The proposed method is based on HPTLC separation of the three drugs followed by densitometric measurements of their spots at 224 nm. Separation was carried out on Merck HPTLC aluminum sheets of silica gel 60 F254 using ethyl acetate–methanol–ammonia (6:4:0.05, v/v) as mobile phase. The linear regression analysis data were used for the regression line in the range of 0.1–0.7, 0.4–4 and 1–6 μg band^{-1} for TAM, TOL and SOL, respectively. The proposed method was validated and successfully applied for the analysis of their pharmaceutical formulations and laboratory-prepared mixtures containing the two bicomponent combinations. The method was validated and showed good performances in terms of linearity, sensitivity, precision, accuracy and stability.	2018	https://doi.org/10.1093/chromsci/bmx081
16	Enhanced spectrofluorimetric determination of two novel combination therapies for the treatment of benign prostatic hyperplasia containing tamsulosin hydrochloride	Pharmaceutical Analytical Chemistry	Two novel combination therapies for the treatment of benign prostatic hyperplasia were analyzed using simple and enhanced spectrofluorimetric methods based on derivative and derivative ratio techniques. The two combinations contained tamsulosin hydrochloride (TAM) as a minor component with tolterodine tartrate (TOL) or solifenacin succinate (SOL). The fluorescence of the three drugs under study was measured in methanolic water solution. For the TAM and SOL mixture, successful resolution between both drugs was achieved by derivative manipulation of both ratio and zero-order emission spectra with good linearity in the ranges of 0.75–3.50 and 2.5–15.0 μg ml^{-1} for TAM and SOL, respectively. Extensive emission spectral overlap was observed for the TAM and TOL mixture. Therefore, only derivative application of the ratio emission spectra resolved such overlap and quantitated TAM and TOL simultaneously in the ranges 0.75–3.50 and 2.5–20.0 μg ml^{-1} for TAM and TOL, respectively. Optimization of various experimental parameters that affected the fluorescence intensity of the three drugs was performed. Successful application of all proposed methods was achieved for analysis of the two drugs in each combination therapy in their laboratory-prepared mixtures and dosage forms with good accuracy and precision.	2018	https://doi.org/10.1002/bio.3475
17	Sensitive inexpensive chromatographic determination of an	Pharmaceutical Analytical Chemistry	This study represents simple inexpensive chromatographic determination of ciprofloxacin (CIP) and tinidazole (TIN) simultaneously in human plasma using HPLC-DAD followed by a pharmacokinetic application. C18 column was used as	2018	https://doi.org/10.1016/j.jchromb.2018.09.008

	antimicrobial combination in human plasma and its pharmacokinetic application		stationary phase with isocratic elution of a mobile phase composed of acetic acid solution (2%) and acetonitrile (85: 15, v/v) and ornidazole as internal standard (IS) with UV detection at 318 nm. The two drugs and the IS were separated at 6.55, 7.91 and 11.07 min for CIP, TIN and IS, respectively, with good selectivity and sensitivity for their analysis in presence of plasma matrix components and the drugs' metabolites. Sample preparation involved only protein precipitation without any complicated extraction procedures decreasing analysis time. For method validation, FDA regulations for analysis in biological fluids were followed. Pharmacokinetic (PK) study on six healthy volunteers was conducted after single oral dose administration of 500 and 600 mg of CIP and TIN, respectively. Dugs' plasma levels were followed for 12 or 72 h post dosing for CIP and TIN, respectively, and different PK data for the two drugs were calculated and they were comparable to the reported values demonstrating successful future application of the presented method in PK, bioequivalence and bioavailability studies.		
18	Simultaneous Determination of Loratadine and Desloratadine in Presence of Pseudoephedrine using Validated Spectrophotometric Methods	Pharmaceutical Analytical Chemistry	Simple, accurate and validated spectrophotometric methods have been described for the simultaneous determination of loratadine (LOR) and its active metabolite desloratadine (DES) in presence of co-formulated drug, pseudoephedrine. Due to the pH dependence of LOR and DES UV spectrum, a pH-induced differential derivative spectrophotometric procedure has been developed for LOR determination in its different pharmaceutical preparations. The method comprised measuring difference absorptivities derivatized in the second order (ΔD2) of a tablet, capsule or syrup extract in 0.1 M HCl relative to that of an equimolar solution in 0.1 M NaOH at a wavelength of 339 nm. On the other hand, for DES determination, the amplitude in the fourth derivative of DES spectrum in 0.1 M HCl at 306 nm was selected directly for its assay. The compliance of Beer's law was adhered over a concentration range of 0.1- 0.5 and 0.25-0.5 mg.mL-1 for LOR and DES, respectively. The proposed method was successfully applied to the analysis of the two drugs in their commercial tablets, capsules, and syrups and the results were in good agreement with those obtained with the comparison method. In addition, the method is validated and showed good performance in terms of linearity, sensitivity, precision, accuracy, and stability. The two methods are proved useful for routine analysis of LOR and DES in quality control laboratories.	2017	https://www.researchgate.net/profile/Rasha-Youssef-2/publication/317389524_Simultaneous_Determination_of_Loratadine_and_Desloratadine_in_Presence_of_Pseudoephedrine_using_Validated_Spectrophotometric_Methods/links/593896580f7e9b32b7075242/Simultaneous-Determination-of-Loratadine-and-Desloratadine-in-Presence-of-Pseudoephedrine-using-Validated-Spectrophotometric-Methods.pdf
19	Validated HPTLC Method for Simultaneous Determination of	Pharmaceutical Analytical Chemistry	A highly validated and selective high performance thin layer chromatography (HPTLC) method was developed for the determination of loratadine (LOR) and desloratadine (DES) in their pharmaceutical formulations. The proposed method	2012	DOI: 10.1556/JPC.25.2012.5.12

	Loratadine and Desloratadine in Presence of Co-Formulated Drug		was based on HPTLC separation of the two drugs followed by densitometric measurements of their spots at 254 nm. The separation was carried out on Merck HPTLC aluminum sheets of silica gel 60 F_{254} using methanol-ammonia (10:0.3, *v/v*) as mobile phase. The linear regression analysis data were used for the regression line in the range of 0.25–0.85 and 0.10–1.00 µg band^{-1} for LOR and DES, respectively. The method was successfully applied to the analysis of the two drugs in their commercial tablets, capsules, and syrups, and the results were in good agreement with those obtained with the comparison method. The proposed method is specific for the simultaneous determination of loratadine and desloratadine in the presence of other co-formulated drugs, such as pseudoephedrine. The method is validated and showed good performances in terms of linearity, sensitivity, precision, accuracy, and stability.		
20	Development and Validation of a High-Performance Thin-Layer Chromatographic Method for the Assay of Ternary Mixtures Containing Cetirizine Dihydrochloride in Pharmaceutical Dosage Forms	Pharmaceutical Analytical Chemistry	A highly validated and selective high-performance thin-layer chromatography (HPTLC) method was developed for the determination of cetirizine dihydrochloride (CET) with pseudoephedrine (PSE) and/or phenylpropanolamine (PPA) and paracetamol (PAR) in their pharmaceutical formulations. The proposed method was based on HPTLC separation of the drugs followed by densitometric measurements of their spots at 257 nm. Separation was carried out on Merck HPTLC aluminum sheets of silica gel 60 F_{254} using methanol-distilled water (9.95:0.05, *v/v*) as mobile phase. The linear regression analysis data were used for the regression line in the range of 1-4, 3–10, 4–8, and 5–100 µg band^{-1} for CET, PSE, PPA, and PAR, respectively. The proposed method was validated and successfully applied for the analysis of pharmaceutical formulations and laboratory-prepared mixtures containing the two multicomponent combinations. The method is validated and showed good performances in terms of linearity, sensitivity, precision, accuracy, and stability.	2014	https://doi.org/10.1556/jpc.27.2014.1.11