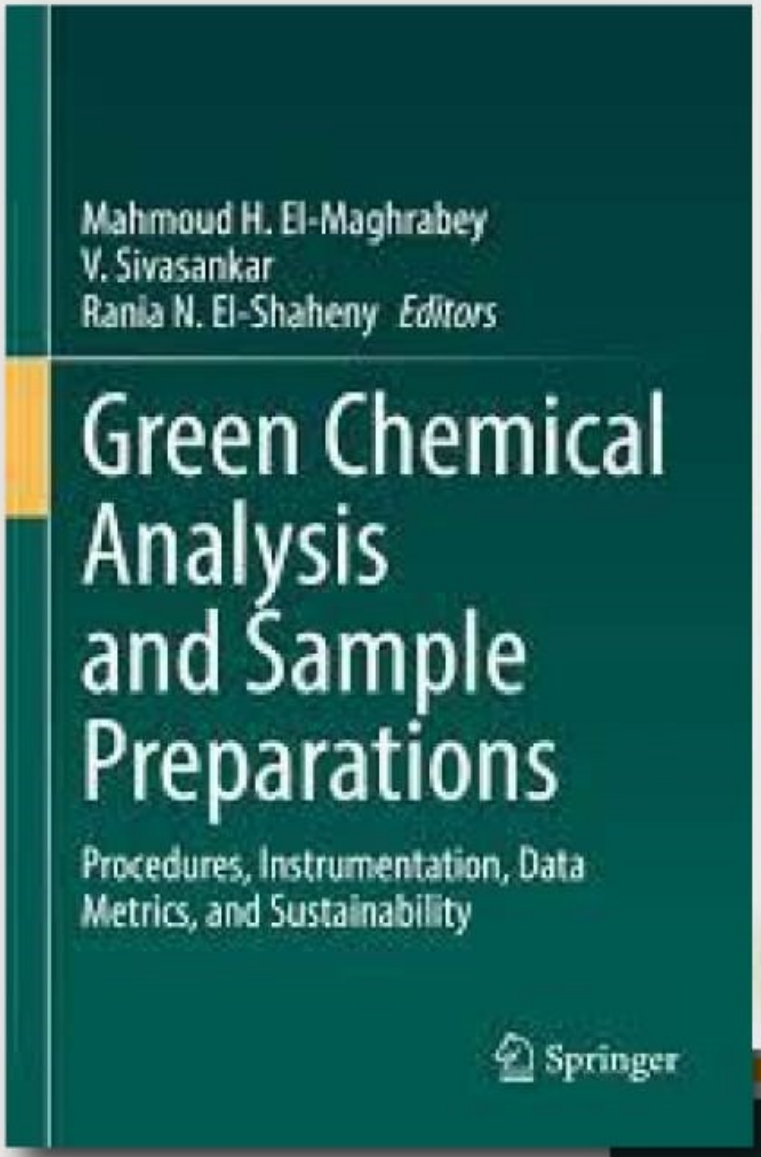
كلية الصيدلة - جامعة المنصورة

قسم الكيمياء التحليلية الصيدلية

تقرير عن مبادرة الكيمياء الخضراء



مبادرة "الكيمياء الخضراء" بقسم الكيمياء التحليلية الصيدلية

تلعب الكيمياء دورًا مهمًا في تطوير التقنيات والمنتجات المبتكرة التي تساهم في النمو الاقتصادي ورفاهية الإنسان، وبدورها تدفع البيئة بشكل متزايد ثمناً باهظاً بسبب الآثار السلبية للمواد الكيميائية الصناعية. من أجل اتجاه جديد واعد في العلوم الكيميائية لتقليل المخاطر، تهدف "الكيمياء الخضراء" أو "الكيمياء المستدامة" إلى تطوير ممارسات كيميائية تحمي البيئة والأشخاص من الأضرار المحتملة من المواد الكيميائية وتقليل استخدام وإنتاج المواد الخطرة.

ومن هذا المنطلق أطلق قسم الكيمياء التحليلية الصيدلية مبادرة **"الكيمياء الخضراء"** تطبيقاً لمبادئ الكيمياء الخضراء ويتمثل ذلك في الدور التعليمي والدور البحثي لأعضاء هيئة التدريس بالقسم بهدف تقليل إنتاج النفايات واستنزاف الموارد الطبيعية، والحفاظ على بيئة صحية، وتطوير طرق تحليلية جديدة تتكيف مع هذه الظروف.

أهداف المبادرة:

١. حسن استخدام الموارد المتاحة وتطبيق أفضل ممارسات الاستدامة.

٢. تعزيز الوعى بأهمية الممارسات المستدامة في مجال الكيمياء الخضراء والاستدامة ونشر وتطوير المهارات بين الأجيال الحالية والأجيال المستقبلية.

3. الاسهام في التحول الأخضر وحماية البيئة وتحقيق الاستدامة في كافة الأعمال البحثية بالقسم.

4. استبدال الكيماويات والمذيبات العضوية الضارة وباهظة الثمن ببدائل أمنة صديقة للبيئة مما يسهم في تقليل معدل استهلاك الكيماويات ويوفر في النفقات.

5. تقليل كمية النفايات الكيميائية الناتجة.

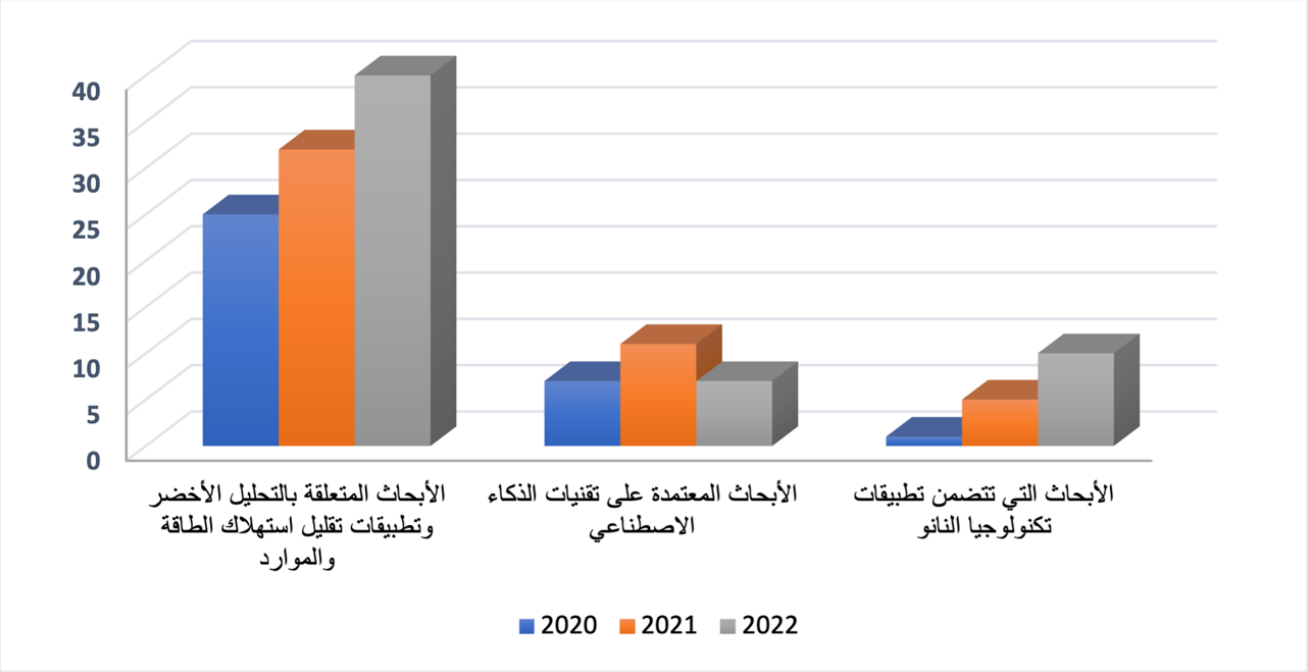
6. الاعتماد على تقنيات الذكاء الاصطناعي لتقليل عدد الاختبارات اللازمة لتصميم وتطبيق الطرق التحليلية ورقابة جودة الدواء عن طريق نظام الاختبارات الذكية.

7. العمل على تقليل استهلاك الطاقة في المعمل البحثي بالقسم.

8. استخدام مواد كيميائية قابلة للتحلل بسهولة بتأثير العوامل الطبيعية إلى مركبات غير ضارة بالبيئة لمنع تحلل هذه المواد إلى ملوثات بيئية كما في حالة المنتجات البلاستيكية التي أدى تراكمها نتيجة بطء تحللها إلى أضرار بيئية جسيمة لم تسلم منها المحيطات، وتشكل تهديدًا للكائنات الحية مع تأثيرات تمتد لعقود.

وبدا ذلك جلياً من خلال الآتي:

1. نشر العديد من الأبحاث المتعلقة بالتحليل الأخضر"Green analysis " وتقييم الاخضرار "Greenness assessment"وكذلك تطبيقات لتقليل استهلاك الطاقة والموارد.
2. نشر العديد من الأبحاث المعتمدة على تقنيات الذكاء الاصطناعي لتقليل عدد الاختبارات اللازمة لتصميم وتطبيق الطرق التحليلية ورقابة جودة الدواء.
3. نشر العديد من الأبحاث التي تتضمن تطبيقات تكنولوجيا النانو واستخدامها كبديل للمواد الكيميائية الخطرة.
4. نشر العديد من فصول الكتب المتعلقة بالكيمياء الخضراء.
5. نشر العديد من الكتب المتعلقة بالكيمياء الخضراء.
6. الحصول على العديد من المشروعات البحثية التي تدور حول/أو تخدم مجال الكيمياء الخضراء والاستدامة.
7. استحداث مقررات دراسية جديدة لتعزيز الوعى بالاستدامة وتحفيز الابتكاروزيادة التفاعل الإيجابي بين البيئة والمجتمع والاقتصاد.
8. تطوير بعض المقررات الدراسية لنشر فكرة الكيمياء الخضراء والاستدامة.
9. توجيه الرسائل العلمية التي يشرف عليها أعضاء هيئة التدريس بالقسم من أجل تطوير طرق تحليلية صديقة للبيئة لخدمة مجال الكيمياء الخضراء والاستدامة.
10. المشاركة في مؤتمرات تخدم مجال الكيمياء الخضراء والاستدامة.
11. مشاركة أعضاء هيئة التدريس بالقسم بالمجلات العلمية الدولية كمحررين لإصدارات خاصة بالكيمياء الخضراء.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الأبحاث المتعلقة بالتحليل الأخضر وتطبيقات تقليل استهلاك الطاقة والموارد
الأبحاث المعتمدة على تقنيات الذكاء الاصطناعي
الأبحاث التي تتضمن تطبيقات تكنولوجيا النانو
2020
2021
2022

➢ وفيما يلي تفاصيل هذه النتائج:

١. نشر العديد من الأبحاث المتعلقة بالتحليل الأخضر"Green analysis " وتقييم الاخضرار "Greenness assessment"وكذلك تطبيقات لتقليل استهلاك الطاقة والموارد.

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2. El-Deen, A.K., Shimizu, K. Deep eutectic solvents as promising green solvents in dispersive liquid–liquid microextraction based on solidification of floating organic droplet: Recent applications, challenges and future perspectives, 2021, Molecules, 26, 23, 7406.
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candidate antiviral; Application in pharmaceutical dosage forms and spiked human plasma, 2021, Analytical Methods, 13, 23.

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15. El Sharkasy, M.E., Tolba, M.M., Belal, F., Walash, M., Aboshabana, R. Quantitative analysis of favipiravir and hydroxychloroquine as FDA-approved drugs for treatment of COVID-19 using synchronous spectrofluorimetry: application to pharmaceutical formulations and biological fluids, Luminescence, 2022, 37, 6.
16. Elawady, T., Al-Abd, A.M., Khedr, A., EL-Enany, N., Belal, F. LC-MS/MS monitoring of the colorectal carcinoma cellular uptake and entrapment of sorafenib and its N-oxide active metabolite, Journal of Pharmaceutical and Biomedical Analysis, 2022, 213, 114687.
17. Zayed, S., Belal, F. Determination of the Monoclonal Antibody Tocilizumab by a Validated Micellar Electrokinetic Chromatography Method, Chromatographia, 2022, 85, 5.

18. Abd-AlGhafar, W.N., Aly, F.A., Sheribah, Z.A., Saad, S. Synchronous Fluorescence as a Green and Selective Method for the Simultaneous Determination of Cetirizine and Azelastine in Aqueous Humor, Journal of Fluorescence, 2022, 32, 3.
19. Yosrey, E., Elmansi, H., Sheribah, Z.A., Metwally, M.E.-S. Micellar-emphasized simultaneous determination of ivabradine hydrochloride and felodipine using synchronous spectrofluorimetry, Luminescence, 2022, 37, 4.
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21. Saad Radwan, A., Salim, M.M., Hadad, G.M., Belal, F., Elkhoudary, M.M. Simultaneous estimation of recently FDA approved co-formulated ophthalmic solution benoxinate and fluorescein: Application to aqueous humor, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 2022, 267, 120599.
22. EL-Shorbagy, H.I., Belal, F. Innovative derivative/zero ratio spectrophotometric method for simultaneous determination of sofosbuvir and ledipasvir: Application to average content and uniformity of dosage units, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 2022, 267, 120623.
23. Zeid, A.M., Aboshabana, R., Ibrahim, F.A. First-order derivative synchronous spectrofluorimetric determination of two antihypertensive drugs, metolazone and valsartan, in pharmaceutical and biological matrices , 2022, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 267, 120591.
24. Elama, H.S., Shalan, S.M., El-Shabrawy, Y., Eid, M.I., Zeid, A.M. Utilization of a micellar matrix for simultaneous spectrofluorimetric estimation of alfuzosin hydrochloride and vardenafil hydrochloride, 2022, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 266, 120420.
25. Abdelaziz, M.A., Shaldam, M., El-Domany, R.A., Belal, F. Multi-Spectroscopic, thermodynamic and molecular dynamic simulation studies for investigation of interaction of dapagliflozin with bovine serum albumin, 2022, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 264, 120298.
26. El-Aziz, H.A., Fathy, M.E., El-Enany, N., Aly, F.A., Tolba, M.M. Concurrent estimation of some co-administered antimicrobial drugs applying conventional and first

derivative synchronous fluorescence spectroscopy techniques, 2022, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 264, 120255.

27. El Sharkasy, M.E., Aboshabana, R., Belal, F., Walash, M., Tolba, M.M. Synchronized spectrofluorimetric determination of ponatinib and curcumin as an effective therapeutic combination in laboratory prepared mixtures and human plasma samples, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 2022, 264, 120235
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29. Wahba, M.E.K., El Sherbiny, D. Applicability of hybrid micelle liquid chromatography for practical determination of acid dissociation constant, 2022, Journal of Taibah University for Science, 16, 1.
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31. Abou-Taleb, N.H., El-Sherbiny, D.T., El-Enany, N.M., El-Subbagh, H.I. A new grey relational analysis application in analytical chemistry: Natural deep eutectic solvent as a green extractant for HPLC determination of lamotrigine in plasma, 2022, Microchemical Journal, 172, 106918.
32. Hassan A.M.E., El Hamd M.A., El-Maghrabey M.H., Mahdi W.A., Alshehri S., Batakoushy H.A. Two Versatile Pencil Graphite–Polymer Sensor Electrodes Coupled with Potentiometry and Potentiometric Titration Methods: Profiling Determinations of Vitamin V in Tablets and Urine Samples, 2022, Sensors, 22, 23, 9128.
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35. Kishikawa N., El-Maghrabey M., Tsubokami A., Hori H., Kuroda N. Development of a Selective Assay of Tyrosine and Its Producing and Metabolizing Enzymes Utilizing Pulse-UV Irradiation-Induced Chemiluminescence, 2022, Analytical Chemistry, 94, 33.
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37. El-Sayed A., Elmansi H., Shalan S., Eid M. Facile approaches for determination of Bromhexine Hydrochloride and its active metabolite Ambroxol Hydrochloride using Eosin Y, 2022, Annales Pharmaceutiques Francaises, 80, 5.
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39. Elama, H.S., Shalan, S.M., El-Shabrawy, Y., Eid, M.I., Zeid, A.M. A synchronous spectrofluorometric technique for simultaneous detection of alfuzosin and tadalafil: Applied to tablets and spiked biological samples, Royal Society Open Science, 2022, 9(7), 220330.
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٢. نشر العديد من الأبحاث المعتمدة على تقنيات الذكاء الاصطناعي لتقليل عدد الاختبارات اللازمة لتصميم وتطبيق الطرق التحليلية ورقابة جودة الدواء.

2020 (7 articles)

1. Salim, M.M., El Sharkasy, M.E., Walash, M., Belal, F. Genetic Algorithm with Model-Updating-Based PLS Regression for the Spectrophotometric Determination of Clopidogrel, Atorvastatin, and Aspirin in the Presence of its Degradation Product, 2020, Journal of Applied Spectroscopy, 87, 3.
2. Nasr, J.J., Shalan, S. Simultaneous estimation of amlodipine and atorvastatin by micelle-augmented first derivative synchronous spectrofluorimetry and multivariate analysis, 2020, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 224, 117430.
3. Abou-Taleb, N.H., El-Sherbiny, D.T., El-Enany, N.M., El-Subbagh, H.I. A novel application of deep eutectic solvents in quantitative nuclear magnetic resonance using grey relational analysis for multi-response optimization, 2020, Chemometrics and Intelligent Laboratory Systems, 206, 104125.
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6. Abou-Taleb, N.H., El-Sherbiny, D.T., El-Enany, N.M., El-Subbagh, H.I. Multiobjective optimization of microemulsion- thin layer chromatography with image processing as analytical platform for determination of drugs in plasma using desirability functions, 2020, Journal of Chromatography A, 1619, 460945.
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enrichment of endocrine disrupting compounds from water, 2020, Journal of Chromatography A, 1629, 461498.

2021 (11 articles)

1. Magdy, G., Abdel Hakiem, A.F., Belal, F., Abdel-Megied, A.M. A novel quality by design approach for development and validation of a green reversed-phase HPLC method with fluorescence detection for the simultaneous determination of lesinurad, febuxostat, and diflunisal: Application to human plasma, 2021, Journal of Separation Science, 44, 11.
2. El-Aziz, H.A., Fathy, M.E., El-Enany, N., Aly, F.A., Tolba, M.M. Investigation of some univariate and multivariate spectrophotometric methods for concurrent estimation of Vancomycin and Ciprofloxacin in their laboratory prepared mixture and application to biological fluids, 2021, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 253, 119570.
3. Zeid, A.M., Abdelazim, A.H., Shahin, M. Simultaneous spectrophotometric quantitative analysis of elbasvir and grazoprevir using assisted chemometric models, 2021, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 252, 119505.
4. Salim, M.M., El Sharkasy, M.E., Belal, F., Walash, M. Multi-spectroscopic and molecular docking studies for binding interaction between fluvoxamine and human serum albumin, 2021, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 252, 119495.
5. Kamal El-Deen, A., Shimizu, K. Modified μ-QuEChERS coupled to diethyl carbonate-based liquid microextraction for PAHs determination in coffee, tea, and water prior to GC–MS analysis: An insight to reducing the impact of caffeine on the GC–MS measurement, 2021, Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences, 1171, 122555.
6. Attia, K.A.M., El-Abasawi, N.M., El-Olemy, A., Abdelazim, A.H., Goda, A.I., Shahin, M., Zeid, A.M. Simultaneous spectrophotometric quantitative analysis of velpatasvir and sofosbuvir in recently approved FDA pharmaceutical preparation using artificial neural networks and genetic algorithm artificial neural networks, 2021, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 251, 119465.

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9. Roshdy A., Elmansi H., Shalan S., El-Brashy A. Factorial design-assisted reversed phase-high performance liquid chromatography method for simultaneous determination of fluconazole, itraconazole and terbinafine, 2021, Royal Society Open Science, 8, 2, 202130.
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2022 (7 articles)

1. Abou-Taleb, N.H., El-Sherbiny, D.T., El-Enany, N.M., El-Subbagh, H.I. A new grey relational analysis application in analytical chemistry: Natural deep eutectic solvent as a green extractant for HPLC determination of lamotrigine in plasma, 2022, Microchemical Journal, 172, 106918.
2. El-Awady, M.I., Abdel-Razeq, S., Barghash, S., Belal, F. Decision-making tree for improving selectivity and sensitivity of sweeping-MEKC determination of hydrophobic analytes: Application to five cardiovascular drugs with greenness assessment, Microchemical Journal, 2022, 181, 107792.

3. Magdy G., Aboelkassim E., El-Domany R.A., Belal F. Green synthesis, characterization, and antimicrobial applications of silver nanoparticles as fluorescent nanoprobes for the spectrofluorimetric determination of ornidazole and miconazole, 2022, Scientific Reports, 12, 1, 21395.
4. Elmansi H., Belal F., Magdy G. Determination of pholcodine alone or in combination with ephedrine in human plasma using fluorescence spectroscopy, 2022, Scientific Reports, 12, 1, 9372.
5. Magdy G., Shaldam M.A., Belal F., Elmansi H. Multi-spectroscopic, thermodynamic, and molecular docking/dynamic approaches for characterization of the binding interaction between calf thymus DNA and Palbociclib, 2022, Scientific Reports, 12, 1, 14723.
6. El Gammal R.N., Elmansi H., El-Emam A.A., Belal F., Hammouda M.E.A. Exploring the molecular interaction of mebendazole with bovine serum albumin using multi-spectroscopic approaches and molecular docking, 2022, Scientific Reports, 12, 1, 11582.
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٣. نشر العديد من الأبحاث التي تتضمن تطبيقات تكنولوجيا النانو واستخدامها كبديل للمواد الكيميائية الخطرة.

2020 (One article)
1. Borg H., Zámbó D., Elmansi H., Hashem H.M., Nasr J.J., Walash M.I., Bigall N.C., Belal F. Preconcentration and detection of gefitinib anti-cancer drug traces from water and human plasma samples by means of magnetic nanoparticles, 2020, Nanomaterials, 10, 6, 1196.
2021 (5 article)
1. El-Shaheny, R., Al-Khateeb, L.A., El-Maghrabey, M., Dual-excitation in-lab-made device based on a handy UV lamp and GQDs-modified PADs for simultaneous determination of acetaminophen and its endocrine disrupting impurity 4-nitrophenol, 2021, Sensors and Actuators B: Chemical, 348,13065 2. Abd Elhaleem, S.M., Elsebaei, F., Shalan, S., Belal, F. Utilization of Localized Surface Plasmon Resonance of Silver Nanoparticles for the Spectrofluorimetric Estimation of Oxymetazoline in Dosage Forms: Application to Aqueous Humor, 2021, Journal of Fluorescence, 31, 6. 3. El-Shaheny, R., Belal, F., El-Shabrawy, Y., El-Maghrabey, M. Nanostructures-based sensing strategies for hydrogen sulfide, 2021, Trends in Environmental Analytical Chemistry, 31, e00133. 4. Magdy, G., Abdel Hakiem, A.F., Belal, F., Abdel-Megied, A.M. Green one-pot synthesis of nitrogen and sulfur co-doped carbon quantum dots as new fluorescent nanosensors for determination of salinomycin and maduramicin in food samples, 2021, Food Chemistry, 343, 128539. 5. Belal, F., Mabrouk, M., Hammad, S., Barseem, A., Ahmed, H. A Novel Eplerenone Ecofriendly Fluorescent Nanosensor Based on Nitrogen and Sulfur-Carbon Quantum Dots, 2021, Journal of Fluorescence, 31, 1.

2022 (10 article)

1. Abd Elhaleem, S.M., Elsebaei, F., Shalan, S., Belal, F. Utilization of N,S-doped carbon dots as a fluorescent nanosensor for determination of cromolyn based on inner filter effect: application to aqueous humour, Luminescence, 2022, 37, 5.
2. Abd Elhaleem, S.M., Elsebaei, F., Shalan, S., Belal, F. Turn-off fluorescence of nitrogen and sulfur carbon quantum dots as effective fluorescent probes for determination of imatinib. Application to biological fluids, Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy, 2022, 272, 120954.
3. El Sharkasy, M.E., Tolba, M.M., Belal, F., Walash, M.I., Aboshabana, R. Thiosemicarbazide functionalized carbon quantum dots as a fluorescent probe for the determination of some oxicams: application to dosage forms and biological fluids, RSC Advances, 2022, 12, 22.
4. Al-Khateeb, L.A., Hakami, W., Abdel Salam, M., Sanari, J.A., El-Shaheny, R., El-Maghrabey, M. Solid phase-fabrication of magnetically separable Fe3O4@graphene nanoplatelets nanocomposite for efficient removal of NSAIDs from wastewater. Perception of adsorption kinetics, thermodynamics, and extra-thermodynamics, Analytica Chimica Acta, 2022, 1223, 340158.
5. Abdallah, N.A., Fathy, M.E., Tolba, M.M., El-Brashy, A.M., Ibrahim, F.A. Innovative localized surface plasmon resonance sensing technique for a green spectrofluorimetric assay of ketoprofen, paracetamol and chlorzoxazone in pharmaceutical preparations and biological fluids, RSC Advances, 2022, 12, 52.
6. Magdy, G., Said, N., El-Domany, R.A., Belal, F. Nitrogen and sulfur-doped carbon quantum dots as fluorescent nanoprobes for spectrofluorimetric determination of olanzapine and diazepam in biological fluids and dosage forms: application to content uniformity testing, BMC Chemistry, 2022, 16, 1, 98.
7. Abd Elhaleem S.M., Shalan S., Belal F., Elsebaei F. Insights for applying N,S-doped carbon dots as a fluorescent nanoprobe for estimation of some nitro-calcium channel blockers, 2022, Royal Society Open Science, 9, 10, 220609.

8. Borg H., Belal F., Draz M.E. Facile fabrication of a portable PANI-NFs/c-MWCNT nano-composite electrochemical sensor for gefitinib: application to human plasma, 2022, Analytical Methods, 14, 45.
9. Shaldam M., Tawfik H., Elmansi H., Belal F., Yamaguchi K., Sugiura M., Magdy G., Synthesis, crystallographic, DNA binding, and molecular docking/dynamic studies of a privileged chalcone-sulfonamide hybrid scaffold as a promising anticancer agent, 2022, Journal of Biomolecular Structure and Dynamics.
10. Magdy G., Al-Enna A.A., Belal F., El-Domany R.A., Abdel-Megied A.M. Application of sulfur and nitrogen doped carbon quantum dots as sensitive fluorescent nanosensors for the determination of saxagliptin and gliclazide, 2022, Royal Society Open Science, 9, 6, 220285.

٤. نشر العديد من فصول الكتب المتعلقة بالكيمياء الخضراء.

2020 (One)	
[1]	El-Shaheny R, El-Maghrabey M, Eid M, El-Enany N, Green Chromatographic Purification of Pharmaceuticals, In: Inamuddin, Rizwana Mobin, Abdullah M. Asiri, Industrial Applications of Green Solvents: Volume II, Materials Research Forum LLC, USA, 2019, 148-181.
2021 (Six)	
[1]	El-Shaheny R, El-Maghrabey M, Chloramines Formation, Toxicity, and Monitoring Methods in Aqueous Environments, In: Inamuddin, Ahamed MI, Boddula R and Rangreez TA, Applied Water Science Volume 1: Fundamentals and Applications, Wiley-Scrivener Publishing LLC, 2021, 139-162.
[2]	El-Maghrabey M*, Amin M, Elgaml A, El-Shaheny R, Biosolvents for biocatalysis, In: Inamuddin, Rajender Boddula, Mohd Imran Ahamed, Abdullah M. Asiri, Green Sustainable Process for Chemical and Environmental Engineering and Science, Green Solvents for Biocatalysis, Elsevier, Netherlands, 2021, 85-107.
[3]	El-Maghrabey M*, El Hamd MA, El-Shaheny R, Kishikawa N, Kuroda N, Green solvents for radionuclides extraction, In: Inamuddin, Rajender, and Abdullah M. Asiri, Green

Sustainable Process for Chemical and Environmental Engineering and Science: Green Solvents for Environmental Remediation, Elsevier, Netherlands, 2021, 121-147.

[4] El-Maghrabey M*, El-Shaheny R, Belal F, Kishikawa N, Kuroda N, Green Sensors for Environmental Contaminants, In: Inamuddin and Abdullah M. Asiri, Nanosensor Technologies for Environmental Monitoring, Springer, 2020, 491-516.

[5] El-Shaheny R, El-Maghrabey M, Belal F, Switchable solvents for biocatalysis, In: Inamuddin, Rajender Boddula, Mohd Imran Ahamed, Abdullah M. Asiri, Green Sustainable Process for Chemical and Environmental Engineering and Science, Green Solvents for Biocatalysis, Elsevier, Netherlands, 2021, 211-233.

[6] El-Shaheny R, El Hamd MA, El-Maghrabey M, Liquid chromatography-mass spectrometry techniques for environmental analysis, In: Inamuddin, Rajender Boddula, Abdullah m. Asiri, Green Sustainable Process for Chemical and Environmental Engineering and Science, Analytical Techniques for Environmental and Industrial Analysis, Elsevier, Netherlands, 2021. 117-141.

2022 (Three)

[1] El Hamd MA, El-Maghrabey MH, Almawash S, El-Shaheny R, Green Hydrotropic Technology as a Convenient Tool for the Handling of Poor Water-Soluble Candidates Proceeding Their Economic Analytical Measurements, In: In El-Maghrabey MH, Sivasankar V, El-Shaheny RN (eds) Green Chemical Analysis and Sample Preparations. Springer, Cham, 2022, 265–309.

[2] El Hamd MA, El-Maghrabey M*, El-Shaheny R, Allam AE, Belal F, Supercritical Fluid Extraction as A Green approach for Essential Oils Extraction, In: El-Maghrabey MH, Sivasankar V, El-Shaheny RN, Green Chemical Analysis and Sample Preparations: Procedures, Instrumentation, Data Metrics, and Sustainability, 2022, Springer, Cham, 2022, 223–264.

[3] El-Maghrabey M*, El-Shaheny R, El Hamd MA, Al-Khateeb LA, Kishikawa N, Kuroda N, Aldehydes' Sources, Toxicity, Environmental Analysis, and Control in Food, In:

Vasanthy M, Sivasankar V, Sunitha TG (eds) Organic Pollutants. Emerging Contaminants and Associated Treatment Technologies. Springer, 2022, 117-151.

٥. نشر الكتب المتعلقة بالكيمياء الخضراء.

2022 (One)

[1] El-Maghrabey MH, Sivasankar V, El-Shaheny RN, Green Chemical Analysis and Sample Preparations: Procedures, Instrumentation, Data Metrics, and Sustainability, 2022, Springer Nature Switzerland AG. 2022.

٦. الحصول على العديد من المشروعات البحثية التي تدور حول/أو تخدم مجال الكيمياء الخضراء والاستدامة.

2022 (Two Projects)

[1] A project Funded by Academy of Scientific Research and technology (ASRT)-Cop27 Green Fund Call

Within in thematic area of: Green innovation to mitigate the impact of climate change

Budget: 750,000 EGP

Team members from Pharm Anal Chem Dep.:

1- Prof Rania El-Shaheny (PI)
2- Assoc. Prof/ Mahmoud El-Maghrabey (COPI)
3- Prof/ Fathalla Belal (Consultant).
4- Dr/ Rasha Abo Shabana
5- Dr/ Heba Maher

[2] A project Funded by Mansoura University Research Fund

Budget: 300,000 EGP

Team members from Pharm Anal Chem Dep.:

1- Assoc. Prof/ Abdallah Zeid (PI)
2- Prof. Jenny Jeehan Nasr (CO-PI)
3- Assoc. Prof/ Mahmoud El-Maghrabey (CO-PI)
4- Prof. Rania Nabih El-Shaheny (CO-PI)

5- Assoc. Prof/ Fawzi Elsebaei (CO-PI)

6- Dr. Rasha Aboshabana (CO-PI)

7- Dr. Asmaa Kamal El-Deen (CO-PI)

7. استحداث مقررات دراسية جديدة لتعزيز الوعى بالاستدامة وتحفيز الابتكاروزيادة التفاعل الإيجابي بين البيئة والمجتمع والاقتصاد.

Green Chemistry Course (PC E 06)

For Level four clinical pharmacy Pharm D students, 2022-2023, first semester.

This course is implemented as part of the UNIDO initiative to spread green chemistry concepts in academia and industry in the world. The course was developed by Yale University. Being a facilitator of the "Global Initiative For Promoting Green Chemistry in Academia and Industry", Dr. Jenny Jeehan Nasr, the head of the department has sought for official approvals of this course to be taught to Mansoura University, Faculty of Pharmacy students, in order to better equip them to participate in the global sustainability efforts. Teaching the course was approved by the Pharmacy Sector Committee, and then a ministerial decision was issued for it to become the first course to educate the principles of sustainability and green chemistry in the Egyptian faculties of pharmacy.

Course members from Pharm Anal Chem Dep.:

Prof. Jenny Jeehan Nasr

Prof. Shereen Mahmoud Shalan

Dr. Asmaa Kamal El-Deen

8. تطوير بعض المقررات الدراسية لنشر فكرة الكيمياء الخضراء والاستدامة.

Advanced spectroscopy Course (PC E01)

Level five, clinical pharmacy, 2021-2022, first semester

Course members from Pharm Anal Chem Dep.:

Prof. Manal I Eid

Prof. Yasser Elshabrawy

Dr. Abdallah Zeid

9. توجيه الرسائل العلمية التي يشرف عليها أعضاء هيئة التدريس بالقسم من أجل تطوير طرق تحليلية صديقة للبيئة لخدمة مجال الكيمياء الخضراء والاستدامة.

2020
1. Green chemistry and its impact on analysis of pharmaceutical compounds. **Prof. Dr Nahed El-Enany.** **Prof. Dr Jenny Jeehan Nasr** **Ass. Prof.Dr Heba Elmansi** **BSC. Diaa Dagher**
2021
1. Development of eco-friendly analytical techniques for determination of certain pharmaceutical compounds. **Prof.Dr Manal I. Eid** **Prof.Dr Rania Nabih El-Shaheiny** **Master. Nermeen Adel**
2022
Novel Applications of Pharmaceutical Analysis with Assessment of Environmental Greenness. **Prof.Dr Rania Nabih El-Shaheiny** **Dr.Rasha Ahmed Abo Shabanah** **BSC.Gehad Nasr**

٩. المشاركة في مؤتمرات تخدم مجال الكيمياء الخضراء والاستدامة.

2020
1. Participation of Dr. Asmaa Kamal El-Deen at 1st Asian Natural Products Conference, May 2020, Kyushu University, Japan (Invited Speaker). **2. Participation of Associate prof/ Rania El-Shaheny in the 24th Annual Green Chemistry and Engineering Conference, ACS Green Chemistry Institute, 15-19 June 2020.**

2021

1. **Participation of Associate prof/ Rania El-Shaheny in the ACS Fall 2021: Resilience of Chemistry, American Chemical Society, Atlanta GA, USA, Aug. 22-26 (Oral-Virtual), with a paper titled: "Correction pen as a hydrophobic/lipophobic barrier plotter integrated with GQDs-modified paper-based chips and a mini-UV torch to implement a costless portable all-in-one device for smartphone-based detection of carbazochrome".**

2. **Participation of Dr. Asmaa Kamal El-Deen at the 17th Annual Conference of the Metabolomics Society, June 2021.**

3. **Participation of Associate prof/ Manar Tolba in the 15th international conference on chemistry and its role in development.**

4. **Participation of Dr. Asmaa Kamal El-Deen at Kyushu University Asia Week 2021**

5. **Participation of Dr. Asmaa Kamal El-Deen at 8th Asian Natural Products Conference, October 2021, Kyushu University, Japan (Invited Speaker)**

١٠. مشاركة أعضاء هيئة التدريس بالقسم بالمجلات العلمية الدولية كمحررين لإصدارات خاصة بالكيمياء الخضراء.

2022

Dr. Asmaa Kamal El-Deen (Guest Editor)

Special Issue (Green Analytical Methods for Pharmaceutical, Biomedical and Environmental Analysis) in Molecules journal.