Mahmoud Medhat Ibrahim Elkhoudary

Date of birth: November5th, 1987.
Marital status: Married.
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Education:

- Ph.D. degree in Pharmaceutical Sciences (Analytical chemistry) - **Suez Canal University**. **September 2017**
  - The work included comparing widely used modern chemometric models, e.g., PLS (partial least squares), PCR (principle component regression), SRACLS (spectral residual augmented classical least squares), MCR-ALS (multicurve resolution alternating least squares), SVR (support vector regression), ANN (artificial neural networks), in the determination of different drug mixtures in unique and complex matrix situations as the case in determinations in the presence of drugs' degradants and in severely overlapped non-linear noisy UV and fluorescence data.
  - The work included the determination of co-administered drug mixture in urine samples using the advantage of excitation-emission fluorescence data using PARAFAC (parallel factor decomposition) chemometric model and its application in urinary excretion study.
  - The work included the use of the highly sensitive UHPLC-ESI-MS/MS method along with the cost saving dilute and shoot sample processing technique in the determination of co-administered drug mixture in urine samples and its application in urinary excretion study and the use of UHPLC method for the stability indicating method for determination of quaternary drug mixture from nearly 36 compounds in less than 9 minutes.

- Master's degree in Pharmaceutical Sciences (Analytical chemistry) - **Suez Canal University**. **July 2011- May 2014**
  - The work included developing and validating new methods for the analysis of different drugs in their pharmaceutical dosage form using chromatographic techniques e.g. HPLC and HPTLC with the aid of experimental design for screening, optimizing and validating these methods.
  - The stability of drugs under different conditions e.g. alkaline and acid hydrolysis, oxidative and photolytic decomposition then detection of degradant using chromatographic techniques.
  - The analysis of different drugs using spectrophotometric techniques e.g. UV and NIR (near infrared) coupled with chemometric techniques e.g. PLS, GA-PLS (genetic algorithm with partial least squares), Linear and nonlinear ANN.

- B.Sc. in Pharmaceutical sciences at Faculty of Pharmacy – **Cairo University** with the Grade **Excellent with honor**. **2004-2009**

Publications:

[1] **M.M. Elkhoudary**, R.A.A. Salam, G.M. Hadad, Comparative artificial neural network and partial least squares models for analysis of Metronidazole, Diloxanide, Spiramycin and Cliquinol in pharmaceutical preparations, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 130 (2014) 222-229.

[2] **M. M Elkhoudary**, R. A Abdel Salam, G. M Hadad, Robustness Testing in HPLC Analysis of clarithromycin, norfloxacin, doxycycline, tinidazole and omeprazole in pharmaceutical dosage forms using experimental design, Current Pharmaceutical Analysis 10(1) (2014) 58-70.

[3] **M.M. Elkhoudary**, R.A. Abdel Salam, G.M. Hadad, Stability-indicating methods for determination of flubendazole and its degradants, Journal of chromatographic science 53(6) (2015) 915-924.

[4] G. Hadad, R.A. Salam, **M. Elkhoudary**, Simultaneous determination of clarithromycin, tinidazole and omeprazole in helicure tablets using reflectance near-infrared spectroscopy with the aid of chemometry, Pharmaceutica Analytica Acta 6(4) (2015).

[5] **M.M. Elkhoudary**, R.A. Abdel Salam, G.M. Hadad, Development and optimization of HPLC analysis of metronidazole, diloxanide, spiramycin and cliquinol in pharmaceutical dosage forms using experimental design, Journal of chromatographic science 54(10) (2016) 1701-1712.

[6] **M.M. Elkhoudary**, I.A. Naguib, R.A. Abdel Salam, G.M. Hadad, Comparison between Two Linear Supervised Learning Machines' Methods with Principle Component Based Methods for the Spectrofluorimetric Determination of Agomelatine and Its Degradants, Journal of fluorescence 27(3) (2017) 1149-1160.

[7] **M.M. Elkhoudary**, R.A.A. Salam, G.M. Hadad, Resolution and quantification challenge of modern chemometric models in the determination of anti-migraine tablets containing ergotamine, caffeine, acetaminophen, and metoclopramide, RSC advances 7(34) (2017) 20936-20946.

[8] **M.M. Elkhoudary**, B.M. Selim, R.A. AbdelSalam, G.M. Hadad, A. El-Gindy, Development and validation of a simple HPTLC method for the determination of new hepatitis C subtype 4 antiviral agents in their tablet dosage form, JPC–Journal of Planar Chromatography–Modern TLC 33(1) (2020) 71-77.

[9] A.M. Nasr, M.K. Qushawy, **M.M. Elkhoudary**, A.Y. Gawish, S.S. Elhady, S.A. Swidan, Quality by design for the development and analysis of enhanced in-situ forming vesicles for the improvement of the bioavailability of fexofenadine HCl in vitro and in vivo, Pharmaceutics 12(5) (2020) 409.

[10] M.A. Diab, A.K. Ibrahim, G.M. Hadad, **M.M. Elkhoudary**, Seasonal Variations in Antioxidant Components of Olea europaea in Leaves of Different Cultivars, Seasons, and Oil Products in Sinai, Food Analytical Methods 14(4) (2021) 773-783.

[11] H.A. Ghanem, A.M. Nasr, T.H. Hassan, **M.M. Elkhoudary**, R. Alshaman, A. Alattar, S. Gad, Comprehensive Study of Atorvastatin Nanostructured Lipid Carriers through Multivariate Conceptualization and Optimization, Pharmaceutics 13(2) (2021) 178.

[12] T.H. Hassan, S.S. Salman, **M.M. Elkhoudary**, S. Gad, Refinement of Simvastatin and Nifedipine combined delivery through multivariate conceptualization and optimization of the nanostructured lipid carriers, Journal of Drug Delivery Science and Technology 64 (2021) 102570.

[13] E.A. Mazyed, D.A. Helal, **M.M. Elkhoudary**, A.G. Abd Elhameed, M. Yasser, Formulation and optimization of nanospanlastics for improving the bioavailability of green tea epigallocatechin gallate, Pharmaceuticals 14(1) (2021) 68.

[14] A.S. Radwan, M.M. Salim, G.M. Hadad, F. Belal, **M.M. Elkhoudary**, 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 267 (2022) 120599.

[15] B.M. Selim, R.A. Abdelsalam, A. El-Gindy, B.G. Eid, T. NEAMATALLAH, A.N. Khayyat, G.M. Hadad, **M.M. Elkhoudary**, A green approach to the analysis of co-administered ampicillin/sulbactam and paracetamol in human urine, Acta Pharmaceutica 72(2) (2022) 259-274.

[16] A.S. Radwan, **M.M. Elkhoudary**, G.M. Hadad, F. Belal and M.M. Salim, A highly sensitive spectrofluorimetric method for the determination of bilastine in its pharmaceutical preparations and biological fluids, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 276 (2022) 121246; https://doi.org/10.1016/j.saa.2022.121246.

[17] A. A. Marie, M. M. Salim, A. H. Kamal, S. F. Hammad, **M. M. Elkhoudary,** Analytical quality by design based on design space in reversed-phase-high performance liquid chromatography analysis for simultaneous estimation of metformin, linagliptin and empagliflozin, Royal Society Open Science 9 (2022) 220215.

Work Experience:

- Lecturer, pharmaceutical chemistry department, Horus University-Egypt, New Damietta, Damietta, Egypt.

  September 2019 – till now

  - Delivering theoretical and practical lectures on pharmaceutical analytical chemistry for the undergraduate pharmacy students.
  - Supervising the practical experiments for pharmaceutical analytical chemistry courses.
  - Supervising 5 undergraduate student projects.
  - Supervising 2 postgraduate Ph.D. dissertations in Analytical Chemistry.
  - Innovated the implementation of virtual chemistry laboratory package (Beyondlabz®) in the development of practical experiments for many departments.
  - Innovated strategies and delivered lectures for the HUE staff members on the integration of MS office 365 platform in online and blended lecturing through and after COVID-19 pandemic periods.
  - Created and Programmed the Faculty of Pharmacy Scientific Production Database.
  - Delivered workshops for staff members and students on best practices on Egyptian Knowledge Bank services (EKB), Design of Experiments methodology (DoE), Chemometrics as well as MS Office and smart board integration.
  - Co-Ordinator of the faculty of pharmacy official website.
  - Co-Ordinator of the faculty of pharmacy IT affairs.
  - Supervisor of Enactus HUE team.
  - Supervisor of Spartans student family.

- Delegated lecturer, pharmaceutics department, Suez Canal University, Ismailia, Egypt.

  September 2020 – January 2021
  September 2021 – January 2022

  - Delivering theoretical and hands-on lectures on Design of experiments for the postgraduate pharmacy Ph.D. students.

- Lecturer, pharmaceutical chemistry department, Sinai University, Al'Arish, North Sinai, Egypt.

  November 2017- August 2019

  - Delivering theoretical and practical lectures on pharmaceutical analytical chemistry for the undergraduate pharmacy students.
  - Supervising the chemistry research laboratory.
  - Supervising 6 postgraduate master's dissertations in different specialties.

- Supervising the practical experiments for pharmaceutical analytical chemistry courses.

- Lecturer, pharmaceutical chemistry department, University of Tabuk, Tabuk, Saudi Arabia.
  January 2015- June 2017
  - Delivering theoretical and practical lectures on pharmaceutical analytical chemistry for the students of both male and female sections and was responsible for evaluating and putting exams of this course.
  - Delivering practical lectures on medicinal chemistry course for the students.
  - Responsible for setting up and performing the practical experiments for both pharmaceutical analytical and medicinal chemistry courses.
  - Trained the students on the advanced analytical instruments, e.g., UHPLC, LC-MS/MS, GC-MS/MS, HPTLC, spectrofluorimeters and UV-VIS-NIR spectrophotometers.
  - A member at the faculty **quality assurance unit** and attended workshops and self-assessment revisions on the accreditation preparations of the faculty.

- Demonstrator then assistant lecturer, pharmaceutical analytical chemistry department, Sinai University, North Sinai
  February 2010- January 2015
  - Trained students on safety inside laboratories and proper handling of laboratory equipment and glass ware.
  - Trained students on different analytical techniques e.g., titrations, spectrophotometric and electrochemical techniques with application on commercial pharmaceutical dosage forms.
  - Trained students on basic quality control skills and performing quality control tests.

- Community pharmacist in **El-Gendy Pharmacy** and **Hani Pharmacy**
  September 2009- February 2010
  - Dispensed prescriptions to patients quickly and accurately.
  - Counseled patients on correct use of over–the–counter medications.
  - Answered phones and assisted customers with product and prescription questions.
  - Proficient compounding of prescriptions.

Conferences and Webinars

- Damietta University – Youth Scientific Conference (Future Scientists 5)
  May 2022
  Supervisor of SPECTacular: A Novel 3D Printed Smartphone Colorimeter and Mobile Application for the Determination of Vitamin C
- Suez Canal University - Youth Conference 9th (Speaker)
  February 2022
  Workshop title: Designing More Efficient and Effective Experiments for Scientific Research
- Suez Canal University - Youth Conference 8th (Speaker)
  January 2021
  Workshop title: A quick guide to master Egyptian Knowledge Bank
- Horus University-Egypt – Elite workshop for staff members (Speaker)
  September 2021

Workshop title: Egyptian Knowledge Bank

- EVA Pharmaceuticals – Online Webinar (Speaker)
  May 2020
  Webinar title: How to write academic research
- Future University – 5th FUE international conference of pharmaceutical sciences (Attendee) **January 2019**

Certificates:

- Data Analysis Challenger Track (8 weeks) – UDACITY, powered by EgyptFWD initiative (Ministry of Communication and Information Technology) and itida
  May 2022
- Pre DOE: Basic Statistics for Experimenters – STATEASE ACADMEY
  November 2020
- 4 Easy Steps to Effective Factorial Design– STATEASE ACADMEY
  November 2020
- Finding the Vital Settings via Factorial Analysis– STATEASE ACADMEY
  January 2021
- How to Save Runs with Fractional Factorial Designs– STATEASE ACADMEY
  January 2021
- Outstanding performance in online learning in the academic year 2020/2021 from **Microsoft Egypt and HUE**
- Best applicatory thesis nomination (Faculty of Pharmacy – Suez Canal University in the academic year 2016/2017)
  May 2018
- Operational and software training on Agilent Cary 5000 UV-Vis-NIR System
  September 2015
- Operational and software training on Agilent 7000 Quadrupole GC/MS/MS system
  October 2015
- Operational and software training on Agilent 6420 Triple Quadrupole LC/MS/MS system
  November 2015
- Course Item Banking and Test Production using X – Pro Milestone – Level 1
  MEU University of Tabuk - March 2017
- Statistical Analysis of research data and students' grades using SPSS
  MEU University of Tabuk - February 2017

Research Skills:

- Invention of the portable colorimeter operated by mobile phone application (**SPECTacular**) for the analysis of chemical compounds.
- Quantitative analysis of Pharmaceutical Compounds in different matrices (e.g., dosage forms, plasma, urine, ….) using wide range of instrumental techniques.
- Ordered, trained on and operated many high-end analytical instruments as:
  1. Ultra-High-performance liquid chromatograph interfaced with diode array and fluorescence detectors by Agilent®.
  2. Liquid chromatograph interfaced with electron spray ionizer and triple quadrupole mass detector by Agilent®.
  3. High-performance liquid chromatograph interfaced with diode array detector by Hitachi®.
  4. High-performance liquid chromatograph interfaced with diode array and fluorescence detectors by Schimadzu®.

5. Gas chromatograph interfaced with electron spray ionizer and triple quadrupole mass detector Agilent®.
6. High performance thin layer chromatograph by CAMAG®.
7. UV-Vis-NIR spectrophotometer by Agilent®.
8. UV-Vis spectrophotometer by Schimadzu®.
9. UV-Vis spectrophotometer by JENWAY®.
10. Spectrofluorimeter by Perkin-Elmer®.

- Multivariate Designing of Experiments (DoE) using advanced statistical software packages (e.g., Design Expert DX11) for wide range of applications (e.g., building analytical method quality-by-design, optimum analytical method parameters, optimum dosage form formulation parameters, optimum extraction solvent proportions, … etc.)
- Utilization of advanced first and second order chemometric models for the spectroscopic analysis of complicated drug mixtures (e.g. PCR, PLS, SRACLS, MCR-ALS, ANN, SVR, XGB, PARAFAC, …. etc.)

Extra Skills:

- IT: Excellent knowledge of Microsoft® Office, MATLAB, Design expert, SPSS and Photoshop CC.
- Languages: Arabic (mother tongue) and English (ITP TOEFL score of 597).
- Valid driving license.
- Efficient, organized, reliable, fast-learner and self-motivated.

Extra-Curricular Activities:

- I have great interest in drawing and attended many drawing events at Cairo and Sinai Universities.