Mai H. ElNaggar

Associate Professor

Department of Pharmacognosy

Kafrelsheikh University, Egypt

+20-1094898928

mai_elnaggar@pharm.kfs.edu.eg

57236775400 0000-0001-5481-2053

Research interest

- My general research theme centers on exploring natural products, synthesized by living organisms and assessing their potential as innovative therapeutic options. Initially, my research journey began with exploring small molecules derived from plants, delving into methods for their isolation, structural elucidation, and assessment of their biological activities.
- Subsequently, I developed a great interest in combining diverse research sets at the interface of chemistry and molecular biology. This allowed me to explore the biosynthesis of natural molecules and the engineering of the enzymes involved in their production to enhance their biosynthetic capabilities.
- My research then progressed to the study of plant-derived cyclic peptides, with a focus on modifying their structures using molecular grafting techniques to serve as potent and selective enzyme inhibitors.
- At present, I am actively seeking research opportunities that enable me to deepen my exploration of cyclic peptides discovery from diverse natural sources. My focus is to study the enzymes responsible for their biosynthesis and to assess their potential for addressing substantial unmet medical needs.

Research skills

Ph.D. in Pharmacognosy (Natural Product Chemistry)

- Extraction, and purification of small molecules using different chromatographic techniques
- Structural elucidation of small molecules using various spectroscopic techniques
- Recombinant protein production and purification
    - Cloning, plasmid preparation, transformation, and DNA extraction
    - Bacterial protein expression
    - Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE)
    - Polymerase chain reaction (PCR), and Agarose gel electrophoresis
    - Protein purification using fast protein liquid chromatography (FPLC)
- Metabolomic profiling of botanical and fungal extracts using LC-MS/MS
- Virtual screening of small molecules and peptides (Autodock, MOE, Pymol, YASARA)
- Preparation of cyclic peptides
    - Solid Phase peptide synthesis
    - Peptide folding
    - Testing peptide serum stability
- Carrying out enzyme assays

Education

Feb 2018	**Ph.D.**	Natural Product Chemistry, Mansoura University, Egypt **Thesis:** Modulation of Chemical Structure and Biological activity of the Alkaloid Ricinine
May 2014	**M.S.**	Natural Product Chemistry, Mansoura University, Egypt **Thesis:** Isolation, Derivatization, and Biological Evaluation of Gingerol Derivatives
July 2010	**B.S.**	Pharmaceutical Sciences, Mansoura University, Egypt

Academic positions & research experience

Dec 2023 - Present	**Associate professor** of Pharmacognosy, Kafrelsheikh University, Egypt - Carrying out research in the field of pharmacognosy and natural product chemistry - Supervising postgraduate research students - Applying for grants to secure research funding - Contacting scientific companies for ordering scientific instruments and consumables - Teaching and demonstrating courses of pharmacognosy, phytochemistry, spectroscopy, chromatography, and biotransformation of natural products to undergraduate and post-graduate students in the Faculty of Pharmacy
Feb 2023 - Dec 2023	**Fulbright post-Doctoral visiting scholar** at Julio Camarero lab, Alfred E. Mann School of Pharmacy, University of Southern California, Los Angeles, CA, USA - Design and synthesis of MCoTI-based cyclic peptides (cyclotides) inhibiting furin enzyme.
Feb 2020 - Feb 2023	**Assistant professor** of Pharmacognosy, Kafrelsheikh University, Egypt
Aug 2019 - Feb 2020	**Post-Doctoral fellow** at the University of Bradford, UK, for a 6-month project investigating the enzymes involved in Saxitoxin biosynthesis
Mar 2018 – July 2019	**Assistant professor** of Pharmacognosy, Sohag University, Egypt
Oct 2014 - Mar 2018	**Teaching assistant** of Pharmacognosy, faculty of Pharmacy, Sohag University, Egypt
Aug 2011- Oct 2014	**Community Pharmacist** at Osman Ahmed Osman governmental hospital, Dakahlia, Egypt

Awards

2023	**Fulbright post-Doctoral visiting scholarship** offered by the United States Department of State
2021-2023	**Research Funding Award** offered by Science, Technology & Innovation Funding Authority (STIFA) in Egypt within the framework of the Demand-Driven Projects in partnership with Nawah Scientific industrial partner. **Project title:** production of enzyme inhibition assay kits as a robust and affordable technique for screening of antiviral compounds against COVID-19, ID: 44025 **Role:** Principal Investigator, **Total Award:** 1872000 LE
2019	**Post-Doctoral Fellowship** offered by the Ministry of Higher Education, Egypt

Publications

- **ElNaggar, M.H.**; Elgazar, A.A.; Gamal, G.; Hamed, S.M.; Elsayed, Z.M.; El-Ashrey, M.K.; Abood, A.; El Hassab, M.A.; Soliman, A.M.; El-Domany, R.A. Identification of sulphonamide-tethered N-((triazol-4-yl) methyl) isatin derivatives as inhibitors of SARS-CoV-2 main protease. Journal of enzyme inhibition and medicinal chemistry 2023, 38, 2234665.
- Abdel Bar, F.M.; Mira, A.; Foudah, A.I.; Alossaimi, M.A.; Alkanhal, S.F.; Aldaej, A.M.; **ElNaggar, M.H.** In Vitro and In Silico Investigation of Polyacetylenes from Launaea capitata (Spreng.) Dandy as Potential COX-2, 5-LOX, and BchE Inhibitors. Molecules 2023, 28, 3526.
- Magdy, G.; **ElNaggar, M.H.**; Belal, F.; Elmansi, H. A novel quality-by-design optimized spectrofluorimetric method for the sensitive determination of ricinine alkaloid in edible oils. Food Chemistry 2023, 404, 134588.
- Abdel Bar, F.M.; Sherif, A.E.; **ElNaggar, M.H.** Galactolipids from Launaea capitata (Spreng.) Dandy with In Vitro Anti-Inflammatory and Neuroprotective Activities. Separations 2023, 10, 83.
- **ElNaggar, M.H.**; Eldehna, W.M.; Abourehab, M.A.; Abdel Bar, F.M. The old world salsola as a source of valuable secondary metabolites endowed with diverse pharmacological activities: a review. Journal of Enzyme Inhibition and Medicinal Chemistry 2022, 37, 2036-2062.
- Abdel Bar, F.M.; Alossaimi, M.A.; Elekhnawy, E.; Alzeer, M.A.A.; Abo Kamer, A.; Moglad, E.; **ElNaggar, M.H.** Anti-Quorum Sensing and Anti-Biofilm Activity of Pelargonium× hortorum Root Extract against Pseudomonas aeruginosa: Combinatorial Effect of Catechin and Gallic Acid. Molecules 2022, 27, 7841.

- Mazyed, E.A.; Badria, F.A.; **ElNaggar, M.H.**; El-Masry, S.M.; Helmy, S.A. Development of Cyclodextrin-Functionalized Transethoniosomes of 6-Gingerol: Statistical Optimization, In Vitro Characterization and Assessment of Cytotoxic and Anti-Inflammatory Effects. Pharmaceutics 2022, 14, 1170.
- Alossaimi, M.A.; Alzeer, M.A.; Abdel Bar, F.M.; **ElNaggar, M.H.** Pelargonium sidoides Root Extract: Simultaneous HPLC Separation, Determination, and Validation of Selected Biomolecules and Evaluation of SARS-CoV-2 Inhibitory Activity. Pharmaceuticals 2022, 15, 1184.
- **ElNaggar, M.H.**; Abdelwahab, G.M.; Kutkat, O.; GabAllah, M.; Ali, M.A.; El-Metwally, M.E.; Sayed, A.M.; Abdelmohsen, U.R.; Khalil, A.T. Aurasperone A inhibits SARS CoV-2 in vitro: an integrated in vitro and in silico study. Marine drugs 2022, 20, 179.
- Suliman, S.N.; **ElNaggar, M.H.**; Elsbaey, M.; El-Gamil, M.M.; Badria, F.A. Bio-guided Isolation of Natural Iron Chelators from Mangifera indica Leaves and their Comparative Study to Desferal®. Natural Product Sciences 2021, 27, 78-85.
- **ElNaggar, M.H.**; Abdel Bar, F.M.; Harsha, C.; Monisha, J.; Shimizu, K.; Kunnumakkara, A.B.; Badria, F.A. Synthesis of new selective cytotoxic ricinine analogues against oral squamous cell carcinoma. Natural Product Research 2021, 35, 2145-2156.
- **ElNaggar, M.H.**; Elgaml, A.; Abdel Bar, F.M.; Badria, F.A. Antimicrobial and antiquorum-sensing activity of Ricinus communis extracts and ricinine derivatives. Natural product research 2018, 1-7.
- **ElNaggar, M.H.**; Mira, A.; Abdel Bar, F.M.; Shimizu, K.; Amer, M.M.; Badria, F.A. Synthesis, docking, cytotoxicity, and LTA4H inhibitory activity of new gingerol derivatives as potential colorectal cancer therapy. Bioorganic & medicinal chemistry 2017, 25, 1277-1285.
- Ibrahim, A.S.; Sobh, M.A.; Eid, H.M.; Salem, A.; Elbelasi, H.H.; **ElNaggar, M.H.**; AbdelBar, F.M.; Sheashaa, H.; Sobh, M.A.; Badria, F.A. Gingerol-derivatives: emerging new therapy against human drug-resistant MCF-7. Tumor Biology 2014, 35, 9941-9948.