

RANA MORSY

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Education

Ph.D of Chemistry, (GPA 3.55) December 2022

Departement of chemistry, College of Liberal Arts and Sciences Wayne State University, Detroit, MI
Thesis title " Free radical and dehydrative methodolgies for total synthesis of bioactive natural products"

M.Sc. of Pharmaceutical Organic Chemistry (total grade 84.60%) February, 2017

Pharmaceutical Organic Chemistry Department, Faculty of Pharmacy, Assiut University, Assiut, Egypt
Thesis title: "Synthesis, Molecular Modeling Study and Anti-inflammatory Activity of Some New Mercaptobenzimidazolyl Acetohydrazide Derivatives Incorporating Different Heterocyclic Moieties"

B.Sc. of Pharmaceutical Sciences (total grade 88.43%) July, 2010

Faculty of Pharmacy, Assiut University, Assiut, Egypt

Work Experience in Organic Chemistry

Lecturer March 2023– present

Instructor December 2010– August 2018

Assiut University, Faculty of Pharmacy, Egypt

- Instructed tutorials, quizzes, and labs.
- Conducted web-based student research activities using Showbie and one note (outlook 365) websites.
- Graded the assignments and conducted the exams.

M.Sc. Research Graduate Student October 2013 - February 2017

- My Master thesis's project involved the synthesis of 50 new compounds with biological investigation for their in vitro ovine COX-1 and human recombinant COX-2 inhibitory activities and in vivo anti-inflammatory activity using carrageenan paw edema method in male rat. Also, it included structural elucidation of the newly synthesized compounds. Molecular docking study of new compounds was investigated, and the study suggested a good affinity for most of the synthesized compounds towards COX-2 active site. During My MSc research work, I also gained experience in the following areas:
- Computational chemistry: Used computer-assisted drug design programs such as MOE software for pharmacophore building, homology modeling, docking simulation and alignment.
- Organic synthesis: Synthesized different heterocyclic organic compounds such as triazoles, thiazolidinones, oxadiazoles, benzotriazoles, benzimidazoles, coumarines and pyrimidines.
- Performed various organic reactions like alkylation, acylation, nitration, coupling reactions, ring closure, Schiff base formation and halogenation.
- Carried out structural elucidation of organic compounds using different spectroscopic techniques.
- Performed various laboratory and purification techniques (TLC, Column Chromatography, Melting point determination, Recrystallization, Distillation, Extraction, Sublimation, Filtration, Titration, Reflux, Volumetric techniques and Reaction workup).

Ph.D. Research Graduate Student August 2018 – December 2022

- Performed Various Organic reactions: Performed several reactions including hydroboration oxidation, allyl alcohol oxidation, azide formation, Stille coupling reaction, Electrochemical organic synthesis reactions, peptide coupling and deprotection reactions.
- Carried out structural elucidation of organic compounds using different spectroscopic techniques.
- Performed various laboratory and purification techniques.

Other Research Activities

October 2016 – August 2018

- I was involved in a research project entitled "Novel Synthetic Inhibitors of Eosinophils with Potential Anti-asthmatic Activity" funded by Science and Technology Development Fund (STDF, grant No. 15065), Department of Pharmaceutical Medicinal Chemistry, Faculty of Pharmacy, Assiut University, Assiut, Egypt. In this project, we made modifications on lidocaine structure through synthesis of different amide derivatives of dimethyl aniline based on pharmacophoric study on a training set, verification of the structures of the synthesized compounds by spectral and/or elemental methods of analyses. Also, estimation of the lipophilicity of the synthesized derivatives (expressed as calculated log P; Clog P) using PC-software package. Biological investigation is in progress.

Professional Training

Graduate Courses:

- Essential research practice: Responsible Conduct of Research.
- Spectral analysis (Mass, IR, ¹H-NMR, ¹³C-NMR, DEPT¹³C-NMR, APT ¹³C-NMR, 2D-NMR (COSY, HMBC, HMQC)).
- Advanced organic chemistry (Organometallic Chemistry, Nomenclature, Rearrangement reactions, organic structure and synthesis, Name reactions in organic chemistry, Stereochemistry and asymmetric synthesis, Purification of organic solvents, Reaction intermediates (Carbocations, Carbanions, Free Radicals, Carbenes, and Nitrenes)).
- Advanced medicinal organic chemistry (Drug metabolism, Isosteres and Bioisosteres, Physicochemical properties in drug design).
- Molecular biology (Genome structure, nucleic acids and proteins, DNA replication, transcription, translation, repair, mutations, gene therapy, inheritance of genetic information, Recombinant DNA technology, DNA/RNA sequencing, PCR, Mobile genetic elements: Transposons, Plasmids and Bacteriophages).
- Electrochemistry and potentiometry, physical chemistry, statistics, lab safety.

Research Interests

- Synthetic organic chemistry to prepare biologically active compounds and natural products.
- Development of new organic synthetic methodologies and their applications in producing natural products with biological activity and anticancer drugs.
- Use of molecular modeling software packages for computer-aided drug design.

Courses Taught

Graduate Teaching Assistant for

- CHM 2220, Organic Chemistry II: in charge of assisting during lecture, preparing problems for discussion sections, maintaining office hours and grading exams.
- CHM 5510, Chemical Synthesis Laboratory: in charge of testing new reactions to guide students, grading assignments, preparation of lab supplies, and ordering chemicals.
- Practical Pharmaceutical Organic Chemistry (I) & (II) for the 2nd year pharmacy students (which includes lab safety, ChemSketch, molecular formulae calculations, Liebig's test, Lassaigne's test, functional group

identification, laboratory techniques, synthesis of formamides, hippuric acid, imines, dibromocinnamic acid, acetylglycine, benzoin and dibenzalacetone, carbohydrate identification, tutorials on stereochemistry, alkylhalides, alcohols and aminoacids).

- Practical Pharmaceutical Organic Chemistry (III) for the 3rd year pharmacy students (which includes acetylation reactions such as aspirin and acetanilide synthesis, bromination reactions like synthesis of p-bromoacetanilide and tribromophenol, nitration reactions such as p-nitroacetanilide and 5-nitrosalicylic acid, Sandmeyer reaction like piodobenzoic acid synthesis, hydrolysis reactions such as synthesis of p-nitroaniline and p-bromoaniline and tutorials on electrophilic aromatic directing groups).
- Practical Pharmaceutical Organic Chemistry (IV) for the 3rd year pharmacy students (which includes heterocyclic synthesis such as benzotriazole, benzimidazole, indole, azalactone, isatin, pyrazolone, oxophthalazine, Biginelli reaction such as synthesis of dihydropyrimidones, Knoevenagel condensation like chromen-2-one and methylumbelliferone synthesis, tutorials on heterocyclic nomenclature, IR, NMR, Mass, ¹³C-NMR).

Honours, Awards and Certificates

- Organic Chemistry Top Graduate Student Award (WSU, Chemistry) April 2022
- Summer dissertation Award from the graduate school (WSU, Chemistry) May 2022
- Poster award from Florida heterocyclic chemistry conference (UF, Chemistry) March 2022.
- Thomas C. Rumble University Graduate Fellowship through the Department of Chemistry at Wayne State University (WSU, Chemistry) 2021-2022.
- A. Paul and Carole C. Schaap Endowed Distinguished Graduate Award in Chemistry (WSU, Chemistry) 2021
- Graduate school honor citation for excellence in teaching as one of the chemistry department top graduate teaching assistants (WSU, Chemistry) 2021
- Recipient of the Dr. Cal Stevens Memorial Scholarship (WSU, Chemistry) 2021
- Recipient of the 2020 Willard R. Lenz, Jr. Endowed Memorial Scholarship (WSU, Chemistry) April 2020
- Honor Citation as one of Chemistry department top Graduate Teaching Assistants (WSU, Chemistry) 2019-2020
- Certificate, International English language testing system (IELTS) May 2017
- Certificate, International Computer Driving license (ICDL) May 2012
- Outstanding Undergraduate Student (B.Sc degree with Honour) April 2011
- Certificate, Test of English as a foreign Language (TOEFL) ITP February 2011

Publications

- Naresh M. Venneti, Ganesh Samala, Rana M. I. Morsy, Lawrence G. Mendoza, Albert Isidro-Llobet, Janine K. Tom, Subha Mukherjee, Michael E. Kopach, and Jennifer L. Stockdill. *J. Am. Chem. Soc.* **2023**, 145, 2, 1053–1061.
- Rana M. I. Morsy, Ola I. A. Salem, Samia G. Abdel-Moty and Abdel-Hamid N. Kafafy "Synthesis, Molecular Modeling Study and Anti-inflammatory Activity of Novel Benzimidazole Derivatives with Promising cyclooxygenase Inhibitory Properties" *Der Pharma Chemica*, **2016**, 8, 213-231.

Workshops and Conferences:

- ACS Central Regional Meeting (Invited talk, Ypsilanti, Michigan, USA, June 2022).
- The Florida Heterocyclic and Synthetic Chemistry Conference (Poster, Gainesville, Florida, USA, March 2022).
- 21st Annual Chemistry Graduate Research Symposium (CGRS), Chemistry Department, Wayne State University, Detroit, MI, USA, October 19th, 2019.
- Tarek Aboul-Fadl, Ahmed S. M. Aboaraia, Abu-Baker M. Abdel-Aal, Mohammed K. Abdel-Hamid, Wesam S. Abdel-Aal, Ola M. F. Abou-Ghadir, Mariam E. I. Abdel-Rasoul, Rana M. Ibrahim, Mostafa A. Hassan, Noha G. M. Fekry, Hend A.A. Abd El-Wahab and Adel F. Youssef, Modified Lidocaine Derivatives as a Potential Inhibitors of Eosinophils, 2nd International Congress and Exhibition on Pharmacy (Pharmacy-2018), Paris, France, August 20-21, 2018., August, 2018.
- Tarek Aboul-Fadl, Ahmed S. M. Aboaraia, Abu-Baker M. Abdel-Aal, Mohammed K. Abdel-Hamid, Wesam S. Abdel-Aal, Ola M. F. Abou-Ghadir, Mariam E. I. Abdel-Rasoul, Rana M. Ibrahim, Mostafa A. Hassan, Noha G. M. Fekry, Hend A.A. Abd El-Wahab and Adel F. Youssef, Novel synthetic inhibitors of eosinophils with potential anti-asthmatic activity, 4th International Congress on Drug Discovery, Designing and Development, Chicago, Illinois, USA, November 2-3, 2017, November, 2017.
- Student Research Symposium "SRS", Faculty of Pharmacy, Assiut University, Assiut, Egypt, April, 2017.
- 9th International Pharmaceutical Sciences Conference, Faculty of Pharmacy, Assiut University, Assiut, Egypt, March 2-13, 2014.
- Workshop on "Publishing and Grant Writing" Assiut University, Assiut, Egypt, April, 2013.
- Workshop on "Using EndNote" Assiut University, Assiut, Egypt, March, 2013.
- Workshop on "Computer Aided Drug Design Using Molecular Operating Environments (MOE)" Software" Assiut University, Assiut, Egypt, January 26-28, 2013.
- Workshop on "International Computer Driving Licence (ICDL)" Assiut University, Assiut, Egypt, December 13, 2010-January 15, 2011.
- Workshop on "Digital Library" Assiut University, Assiut, Egypt, October 2-3, 2010.
- Workshop on "First Aid and Emergency Care" Faculty of Pharmacy, Assiut University, Assiut, Egypt, June 16-19, 2008.

Memberships

- Member, Egyptian Pharmacist Syndicate. September 2010 - Present

Computer Proficiencies

- Acid lab and ChemBioDraw programs, and MestRenova NMR software.
- Molecular Operating Environment (MOE) 2008-2014.
- International Computer Driving License (ICDL), and EndNote programs.