CURRICULUM VITAE (CV)

Dr. Mohamed Hekal

(I) Personal Information:

Name: Mohamed Hussein Hussein Moustafa Hekal

Occupation: Assistant Professor of Organic Chemistry, Chemistry Department, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt

Date and place of birth: 25 / 01 / 1986, Belbeis, Sharkia, Egypt

Nationality: Egyptian **Sex:** Male **Marital status:** Married, have three daughters

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(II) Educational Certificates:

- Ph.D. in Organic Chemistry, Ain Shams University, Egypt, 2014.
- M.Sc. in Organic Chemistry, Ain Shams University, Egypt, 2011.
- B.Sc. in Chemistry, Faculty of Science, Ain Shams University, Very good with Honors, Ranked First out of basic chemistry students, 2007.

(III) Academic and Professional Positions:

- **Postdoctoral Fellow**, Muroran Institute of Technology, Japan, July 2024 – September 2024.
- **Postdoctoral Visiting Scholar** in the Kwon group, University of California-Los Angeles (UCLA), USA, January 2023 – July 2023.
- **Assistant Professor of Organic Chemistry**, Faculty of Science, Ain Shams University, Egypt, 2020 – present.
- **Lecturer of Organic Chemistry**, Faculty of Science, Ain Shams University, Egypt, 2014.
- **Teaching Assistant of Organic Chemistry**, Faculty of Science, Ain Shams University, Egypt, 2011.
- **Research Assistant**, Chemistry Department, Faculty of Science, Ain Shams University, Egypt, 2008.

(IV) Scientific Activity

He published ~26 papers [including Bioorganic chemistry IF (2023) = 4.5, Scientific reports. IF (2023) = 3.8, RSC Advances. IF (2023) = 3.9]. Author of 2 review articles.

H-index = 13.

(V) Skills

Language skills: Arabic Native, Fluent command English.

Digital skills: Microsoft office, Microsoft word, Microsoft excel, Microsoft Powerpoint, Outlook, Zoom, Google drive, Chemdraw, Scifinder, Mestrenova, Reaxys data base.

(VI) Hobbies and interests

Sports, Drama, Music, travel and experience different cultures.

(VII) Honors and awards

- Winner of MuroranIT Foreign Researcher Competition, invited to work at Muroran Institute of Technology, Japan, 2024.
- Winner of the USAID Postdoctoral Competition, invited to work at University of California-Los Angeles (UCLA), USA for 6 months in the department of Chemistry and Biochemistry, 2022.
- The international publication award, Ain Shams University (2017-2023).

(VIII) Professional experiences

- Vice President of Biological Science Control (November 2023- present).
- Head of the quality committee in the department of chemistry (October 2021- October 2022).
- Participation as a member in the quality committee for postgraduate students, the academic guidance committee, and development of practical courses' committee.
- Member of the Biological Sciences Control.
- Member of the development of undergraduate students' laboratory experiments (Organic chemistry division).
- Member of the students' examination committees (Department).

(IX) Conferences

- 12th International Ain Shams University Conference (Partnerships & Alliances), 2024.
- The fourth International Scientific Conference of the Faculty of Science, Ain Shams University (Shaping the Future-SF 2021).

(X) Teaching Experience: Teaching academic theoretical and practical courses for undergraduate students

Theoretical Courses:

Chemistry of Vitamins	Aromaticity	Terpenoids
Chemotherapy	Aliphatic chemistry	Aromatic chemistry
Reaction mechanism	Stereochemistry	Spectroscopy
Amino acids & lipids	polymers	Heterocyclic chemistry
Dyes	Alkaloids	Environmental chemistry

(XI) Training:

Training courses of FLDP program (Faculty and Leadership Developing Project) at Ain Shams University:

Communication skills	Research skills	Teaching skills
Presentation skills	The use of technology in teaching	The ethics of scientific research
The credit hours	International publishing	Systems exams and student assessment
Quality standards in the teaching process	The financial and legal aspects of business in the university	E-Learning using ASU2Learn (Advanced level)

(XII) <u>Research Interests and Creative works</u>:

I have recently formulated a new approach for selective $C(sp^3)$-$C(sp^2)$ bond functionalization of alkenes, using a combination of O_3-mediated oxidation and Ni(II)–mediated reductive fragmentation–radical capture. This redox based dealkenylative radical chemistry has allowed me to employ readily available natural products (e.g., terpenoids) as starting materials to streamline the chemical synthesis of biologically active natural product targets and active pharmaceutical ingredients. Therefore, my research interests focuses on the following research areas based on synthetic organic chemistry:

1. Development of Ni(II)-catalyzed dealkenylative Suzuki–Miyaura cross coupling reaction of alkenes to prepare $C(sp^3)$-$C(sp^3)$ and $C(sp^3)$-$C(sp^2)$ coupled products. This scenario will particularly explore for the dealkenylative arylation/alkylation. The ready availability of boronic acids and other organoboron species will provide a straightforward path for the diversification of terpenoids to access valuable carbon frameworks.
2. Design and synthesis of molecules having unique biological activity. My research interests encompass from novel synthetic methods which involved in the construction of bioactive organic molecules using new, efficient synthetic tools. In particular, my work is concerned with the development of annulation methodologies suitable for heterocyclic substrates and their further adaptation to the synthesis of biologically active natural products analogues. I am also interested in developing reactions that yields highly functionalized heterocyclic motifs in a robust way, with high yields.

During my doctoral studies I trained undergraduate researchers and helped new graduate students start on their respective projects and thesis. These experiences were very helpful as I began my own academic career. In addition, I served as a laboratory instructor for general chemistry classes which gave me further insights into the interests of undergraduates, particularly those who did not want to become scientists. After I got my PhD, during this time I continued my supervision of undergraduate and graduate students, "These experiences demonstrated the commitment required to maintain a productive leading-edge research group, which I fully intend to draw on to develop a vigorous research and teaching program as a professor."

One of the most important things that I want to achieve from a postdoc is to develop a series of research proposals reflecting possible areas of interest as a future professor or research scientist in industry and I could play an important role in developing a teaching, as well as research.

Results of my research have been reported in some international journals of chemistry (ISI) in **26** articles.

(XIII) <u>Students previously and currently advised</u>

Former master students:

1. Paula Soliman-2020

Former Ph.D. students:

2. Ph.D. Yasmeen Mohamed-2019
3. Ph.D. Nancy Abdel Gawad-2019
4. Ph.D. Paula Soliman-2023

Current Ph.D. students:

1. M.S. Nourhan Mahmoud
2. M.S. Mahmoud Khaled
3. M.S. Hossam Sobhy

(XIV) <u>List of publications:</u>

26. Rational design and synthesis of new pyrrolone candidates as prospective insecticidal agents against *Culex pipiens* L. Larvae. **Mohamed H. Hekal**, Ahmed I. Hashem, Fatma S.M. Abu El-Azm, Doaa R. Abdel- Haleem, El-Hady Rafat, Yasmeen M. Ali. *Scientific reports*, 2024, 14, 24467.
25. Synthesis, DFT calculations, and biological studies of new 2-cyano-3-(naphthalene-1-yl)acryloyl amide analogues as anticancer agents. **Mohamed H. Hekal**, Hanaa Farag, Abdelaal A. Abdalha, Amira T. A. Mohamed. *Chemistry& Biodiversity*, 2024, e202401023.
24. Novel pyrano[2,3-c]pyrazolopyrimidines as promising anticancer agents: Design, synthesis, and cell cycle arrest of HepG2 cells at S phase. David S.A. Haneen, **Mohamed H. Hekal**, Wael S.I. Abou-Elmagd, and Wael M. El-Sayed. *Synth. Commun*, 2024, 8, 655–671.
23. New pyrazolo[3,4-d]pyrimidine derivatives as EGFR-TK inhibitors: design, green synthesis, potential anti-proliferative activity and P-glycoprotein inhibition. Aya I. Hassaballah, Asmaa M. AboulMagd, Magdy M. Hemdan, **Mohamed H. Hekal**, Amira A. El-Sayed and Paula S. Farag. *RSC Adv*., 2024, 14, 1995–2015.
22. New 1,3,4-thiadiazoles as potential anticancer agents: pro-apoptotic, cell cycle arrest, molecular modelling, and ADMET profile. **Mohamed H. Hekal**, Paula S. Farag, Magdy M. Hemdan, Amira A. El-Sayed, Aya I. Hassaballah and Wael M. El-Sayed. *RSC Adv*., 2023, 13, 15810.

21. Diversity oriented synthesis and SAR studies of new quinazolinones and related compounds as insecticidal agents against Culex pipiens L. Larvae and associated predator. **Mohamed H Hekal**, Yasmeen M Ali, Doaa R Abdel-Haleem, Fatma S M Abu El-Azm. *Bioorg. Chem.*, 2023, 133, 106436.
20. New Benzochromeno[2,3-d]Pyrimidines and Benzochromenotriazolo[1,5-c]Pyrimidines as Potential Inhibitors of Topoisomerase II. **Mohamed H. Hekal**, Sandy S. Samir, Yasmeen M. Ali, and Wael M. El-Sayed, *Polycyclic Aromatic Compounds,* 2022, 42, 7644-7660.
19. New *N*-(1,3,4-Thiadiazol-2-yl)furan-2-carboxamide Derivatives as Potential Inhibitors of the VEGFR-2. **Mohamed H. Hekal**, Paula S. Farag, Magdy M. Hemdan, Wael M. El-Sayed. *Bioorg. Chem.,* 2021, 115, 105176.
18. An Efficient Synthesis and Evaluation of Some Novel quinazolinone-pyrazole hybrids as Potential Antiproliferative Agents. Abdelaal A. Abdalha, **Mohamed H. Hekal**. *Synth. Commun,* 2021, 51, 2498–2509.
17. An efficient approach for the synthesis and antimicrobial evaluation of some new benzocoumarins and related compounds. **Mohamed H. Hekal**, Fatma S.M. Abu El-Azm, Sandy S. Samir, *Synth. Commun,* 2021, 51, 2175–2186.
16. Utilization of cyanoacetohydrazide and 2- (1,3-dioxoisoindolin-2-yl) acetyl chloride in the synthesis of some novel anti-proliferative heterocyclic compounds. **Mohamed H. Hekal**, Yasmeen M. Ali and Fatma S. M. Abu El-Azm, *Synth. Commun*, 2020, 50, 2839-2852.
15. Synthesis of new oxadiazol-phthalazinone derivatives with anti-proliferative activity; molecular docking, pro-apoptotic, and enzyme inhibition profile. **Mohamed H. Hekal**, Abeer M. El-Naggar, Fatma S. M. Abu El-Azm and Wael M. El-Sayed . *RSC Adv.*, 2020, 10**,** 3675-3688.
14. Convenient synthesis and anti-proliferative activity of some benzochromenes and chromenotriazolopyrimidines under classical methods and phase transfer catalysis. Amira T. Ali and **Mohamed H. Hekal** *Synth. Commun,* 2019, 49, 3498-3509.
13. N'-(1-([1,1'-biphenyl]-4-yl)ethylidene)-2-cyanoacetohydrazide as scaffold for the synthesis of diverse heterocyclic compounds as prospective antitumor and antimicrobial activities. Nancy A. Hamed, Magda I. Marzouk, Mahmoud F. Ismail and **Mohamed H. Hekal,** *Synth. Commun,* 2019, 49, 3017-3029

12. Ecofriendly and Highly Efficient Microwave-Induced Synthesis of Novel Quinazolinone Undecyl Hybrids with *In Vitro* Antitumor activity. **Mohamed H. Hekal**, Fatma S.M. Abu El-Azm and Saad R. Atta-Allah. *Synth. Commun,* 2019, 49, 2630–2641.
11. Facile Synthesis and Anticancer Activity of Novel 4-Aminothieno[2,3-d]pyrimidines and Triazolothienopyrimidines. Fatma S. M. Abu El-Azm, Amira T. Ali and **Mohamed H. Hekal**, *Organic Preparations and Procedures International*, 2019, 51, 507-520
10. Design, Synthesis, and Evaluation of Some Novel Heterocycles Bearing Pyrazole Moiety as Potential Anticancer Agents. Nancy Abdelgawad, Mahmoud F. Ismail, **Mohamed H. Hekal**, and Magda I. Marzouk, *Journal of Heterocyclic Chemistry*, 2019, 56, 1771-1779.
9. Synthesis, Spectral Characterization, and In Vitro Biological Evaluation of Some Novel Isoquinolinone-based Heterocycles as Potential Antitumor Agents. **Mohamed H. Hekal**, Fatma S. M. Abu El-Azm and Hanan A. Sallam, *Journal of Heterocyclic Chemistry,* 2019, 56, 795-803.
8. New potential antitumor quinazolinones derived from dynamic 2-undecyl benzoxazinone: Synthesis and cytotoxic evaluation. **Mohamed H. Hekal** and Fatma S.M. Abu El-Azm, *Synth. Commun,* 2018, 48, 2391-2402.
7. Synthesis and antitumor evaluation of novel tetrahydrobenzo [4′,5′] thieno [3′,2′:5,6] pyrimi-do[1,2-b] isoquinoline derivatives". Mahmoud R. Mahmoud, Fatma S. M. Abu El-Azm, Mahmoud F. Ismail, **Mohamed H. Hekal** and Yasmeen M. Ali, *Synth. Commun,* 2018, 48, 428-438.
6. Novel synthesis of isoquinoline derivatives derived from (Z)-4-(1,3-diphenylpyrazol-4-yl)-isochromene-1,3-dione. M.R. Mahmoud, W.S.I. Abu El-Magd, M.M. El-Shahawi, **Mohamed H. Hekal,** *Synth. Commun,* 2015, 45,1632-1641.
5. Efficient MW-assisted synthesis of some new isoquinolinone derivatives with in vitro antitumor activity" **Mohamed H. Hekal** and Fatma S.M. Abu El-Azm, *J.Het. Chem*, 2017, 54, 3056-3064.
4. Recent developments in chemistry of phthalazines. F.S.M.Abu El-Azm, M.R. Mahmoud, **Mohamed H. Hekal**. *Org. Chem Curr. Res., 2014,* 4(1), 1-12.
3. Novel Fused and Spiro Heterocyclic Compounds derived from 4-(4-amino-5-mercapto-4*H*-1,2,4-triazol-3-yl)phthalazin-1(2*H*)-one. Mahmoud R. Mahmoud, Wael S.I. Abou-Elmagd, Manal M. El-Shahawi and **Mohamed H. Hekal**, *Eur. Chem. Bull.*, 2014, 3(7), 723-728.

2. Synthesis and spectral characterisation of some phthalazinone derivatives. Mahmoud R. Mahmoud, Wael S.I. Abou-Elmagd, Hamed A. Derbala and **Mohamed H. Hekal,** *J. Chem. Res.*, 2012, 2, 75-82.
1. Novel Synthesis of Some Phthalazinone Derivatives. Mahmoud R. Mahmoud, Wael S.I. Abou-Elmagd, Hamed A. Derbala and **Mohamed H. Hekal,** *Chin. J. Chem.*, 2011, 29, 1446-1450.

Final Scholarship Report from the host professor at University of California-Los Angeles.

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July 22, 2023

Ministry of Higher Education- Central Administration for Missions
7 Dr. Ibrahim Abu Al-Naga Street- Nasr City- Diplomatic Quarter-Cairo
USAID office- Fourth floor

Re: Final Scholarship Report

Dear Correspondent,

Dr. Mohamed Hussein Hussein Moustafa Hekal has been carrying out his scholarship in the Department of Chemistry and Biochemistry at University of California, Los Angeles (UCLA). He began his studies on January 26, 2023 and will finish his work on July 25, 2023. His fellowship on the chemistry related with the redox-driven dealkenylative radical chemistry. He is working on development of Ni(II)-catalyzed dealkenylative Suzuki–Miyaura cross coupling reaction of alkenes to prepare C(sp3)-C(sp3) and C(sp3)-C(sp2) coupled products. The insights that his studies provide will be very important in designing new compounds for use as potential pharmaceutical agents. Dr. Mohamed has worked diligently during his time in my lab. He has been present on each workday since his arrival at UCLA. We wish his success in his future career and future studies.

Please do not hesitate to contact me if you require additional information.

Sincerely,

Ohyun Kwon, Ph.D.
Professor