

## Dr. Mohammed Kabir Uddin

PhD (Australia), MS (Canada), MPhil (BUET), MSc (CU), BSc (Hons.)

Assistant Professor

Department of Biochemistry & Microbiology

& Research Coordinator, SHLS

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### Career Summary

I have more than 15 years of experience in teaching, research and in the industrial sector in multicultural work environments (Australia, Canada and Bangladesh).

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### Academic Qualifications

**PhD in Bioinorganic Chemistry** July 2013 – Apr 2017

**Murdoch University, Perth, Australia**

*Dissertation Title:* Investigation of the Substitution Reaction Pathways of Antidiabetic Chromium (III) Supplements

*Concentration:* Investigating both experimental and computational methods

**Master of Science (MS) in Computational Biochemistry** Sep 2009 – Apr 2013

**Memorial University of Newfoundland (MUN), Canada**

CGPA: 3.50 in the scale of 4.0

*Dissertation Title:* Computational Study for the Reaction Mechanism of the Hydrolytic Deamination of Nucleic Acids and Derivatives of Cytosine

**Master of Philosophy (MPhil) in Organic Chemistry** Oct 2001 – Dec 2006

**Bangladesh University of Engineering & Technology (BUET), Dhaka**

CGPA: 3.17 in the scale of 4.0 (Equiv. First Class)

*Dissertation Title:* Synthesis of Some New Annulated Fused Heterocyclic Derivatives of Biological Importance

**Master of Science in Organic Chemistry** Dec 1998 – Jan 2001

**University of Chittagong (CU), Bangladesh**

Result: First Class (3<sup>rd</sup> Position)

*Dissertation Title:* Synthesis, Characterization and Antimicrobial Activity of Some New Annulated Fused Pyrimidines

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**Bachelor of Science (Honors) in Chemistry** Sep 1999 (Session 93)  
**University of Chittagong (CU), Bangladesh**  
Result: 59.0% (2<sup>nd</sup> Class 4<sup>th</sup> Position)

**Higher Secondary Certificate (H.S.C)** 1992  
**Govt. Titumir College, Dhaka, Bangladesh**  
Result: First Division

**Secondary School Certificate (S.S.C)** 1990  
**Kadamtala Purbo Bashabo High School, Dhaka, Bangladesh**  
Result: First Division

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### Teaching Interests

- Biophysical Organic Chemistry
- Medicinal Chemistry and Drug Discovery
- Biochemistry and Molecular Biology
- Computational Biochemistry
- Inorganic and Coordinate Chemistry
- Organic Chemistry
- Spectroscopy Analysis
- Physical Chemistry
- Analytical Chemistry

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### Teaching Experience

Six years and seven months of experience as a teaching assistant in the Department of Chemical and Metallurgical Engineering and Chemistry at Murdoch University, Perth, Western Australia and in the Department of Chemistry of Memorial University, Canada.

**Teaching Assistant in Undergraduate Chemistry Laboratory** Jan 2014 - Dec 2016  
**Murdoch University, Perth, Western Australia**

- Fundamentals of Chemistry (CHE 140)

### Responsibilities

- To demonstrate general operating principles of chemistry. Each subject was taught with practical class components involving handling and operating related equipment, conducting experiments, practical exercises and processes, as well as explaining occupational health and safety practices.
- Laboratory supervision including safe handling of equipment and chemicals during each practical class. In addition, ensuring lab techniques are correct, and answering chemistry questions associated with written lab reports.
- Evaluating lab reports and uploading student grades into the online 'Grade BOOK'.

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**Teaching Assistant in Undergraduate Chemistry Laboratory** Jan 2014 – Dec 2016  
**Murdoch University, Perth, Western Australia**

- Biological Science (BSC 150)

**Responsibilities**

- Demonstrating general introductory lab lectures.
- Explaining the principles of operation of several lab analytical techniques, including UV-Vis, ATR-FTIR, Raman, NMR, HPLC, AAS and GCMS analysis
- Explaining Computational Chemistry and how it can be applied to a range of chemistry problems, including the investigation of geometrical properties, physical properties and reaction mechanisms involving biological systems.

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**Teaching Assistant in Undergraduate Chemistry Laboratory** Sep 2009 – Apr 2013  
**Memorial University, St. John's Newfoundland, Canada**

- Introduction Chemistry I (C 1010) Sep 2009 – Apr 2013
- Introduction Chemistry II (C 1011) Sep 2011 – Apr 2012
- General Organic and Biochemistry I (C 1050) Jan 2010 – Apr 2011

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**Research Experience and Interests**

**Recent Interests**

- Synthesis and characterization of Cr(III) amino acid derivatives (e.g. Cr(me)<sub>3</sub>, Cr(cys)<sub>3</sub>, Cr(glu)<sub>3</sub> and Cr(D-phe)<sub>3</sub>), as well as mix ratios of amino acids (or other ligands) with transition metals for **medicinal drug development**
- Research in organometallic and bioinorganic chemistry includes synthesis, structural characterisation, fundamental mechanistic and reactivity studies of transition metals
- Synthesis and characterization of new fused heterocyclic derivatives of biological importance as well as Organic chemistry including synthetic organic, mechanistic and analytical organic chemistry
- Computational chemistry is used understanding and predicting experimental results of reaction mechanisms, fundamental structures, the molecular modelling of biologically active compounds (computer-aided drug design), and the design of substrates in separation science

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**PhD Research**

Jan 2014 – Feb 2017

**Murdoch University, Perth, Western Australia**

- Synthesis and Characterization of antidiabetic Cr(III) supplements using experimental techniques (TGA-DSC, elemental analysis, UV-Vis, ATR-FTIR, Raman, XRD, SEM, NMR, EPR, ESI-MS, HPLC, AAS and Cyclic Voltammeter (CV) for Electrochemistry).

- Investigation of the biochemical pathways involved in the solution chemistry of antidiabetic Cr(III) supplements under biological environments, and better understanding of the role of Cr(III) species in treating type II diabetes.
  - Computational study of structures, proposed reaction mechanisms and reaction thermodynamics using computational chemistry of Cr(III) with amino acid.
  - Monitoring of reaction progress using UV-Vis spectroscopy at different temperatures and pH values.
  - Construction of a model of the reaction mechanism involving biomolecules using “Gauss View” and Gaussian software.
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#### **PhD Research**

July 2013 - Dec 2013

**Wollongong University, NSW, Australia**

- Reaction pathways of DNA in biological systems.
- Investigation of the deamination reaction of cytosine dimers.

#### **Master of Science in Computational Biochemistry**

Sep 2009 - Apr 2013

**Memorial University of Newfoundland, Canada**

- Reaction mechanism of the hydrolytic deamination of nucleic acids and derivatives of cytosine computational chemistry
  - Thermochemical and thermodynamics properties of  $\alpha$ -amino acids and nucleic acids
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#### **Experience in Educational and Industry**

##### **Assistant Professor**

Oct 2020 – 7<sup>th</sup> May 2022

**IUBAT-International University of Business Agriculture and Technology**

Department of Chemistry, CAAS

Courses: CHM 117 Basic Fundamental Chemistry

CHM 115 Basic Fundamental Chemistry

CHM 118 LAB

CHM 116 LAB

##### **Adjunct Assistant Professor (ID 6042)**

Sep 2017 – Sep 2020

**Independent University, Bangladesh (IUB)**

School of Life Sciences (SLS)

Courses: BIO 201 Organic Chemistry I

BIO 202 Organic Chemistry II

BIO 206 LAB

BIO 103 General Chemistry

BIO 103 LAB

**Adjunct Assistant Professor** Oct 2018 – Jan 2019  
**University of Dhaka, Bangladesh**  
Department of Theoretical and Computational Chemistry  
Course: TCC 503  
TCC 522L

**Head, Department of Chemistry** Jan 2019 – Sep 2020  
**Mastermind English Medium School, Bangladesh**

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**Consultant:** Feb 2017 – Mar 2017 (6 weeks)  
The Feel Great Challenge Company, Western Australia

### Responsibilities

- Development of a research framework to analyze the effectiveness of new weight loss supplements.
- A full analysis of the latest evidence and published research in support of active ingredients of protein, metal and organic acids, and a market review of unique selling points.

**Research Assistant:** April 2013 – July 2013  
**Memorial University of Newfoundland, Canada**

- Bond dissociation energies and enthalpy of formation of  $\alpha$ -amino acids radicals.
- Electron donating and electron withdrawing attack in the C-5 position of Cytosine.

### Teaching Assistant in Undergraduate Student:

**Memorial University of Newfoundland, Canada** Sep 2009 – Apr 2013  
**Murdoch University, Perth, Western Australia** Jan 2014 – Dec 2016

**Quality Control Executive:** Apr 2005 – Aug 2009

*Incepta Pharmaceutical Ltd.*, Dhaka, Bangladesh

**Research and Development Chemist:** Aug 2002 – Apr 2005

*The ACME Laboratories Ltd.*, Dhaka, Bangladesh

### Responsibilities

- Monitoring the standard operation procedure (SOP) for pharmaceutical development including ICH guidelines (i.e. GLP, GMP, FDA regulation) and ISO requirements. Assurance of compliance of in-house and external specifications to meet standards
- Analysis of different raw materials and finish products (Active and Excipient) with various equipment's such as HPLC, FTIR, UV-Vis, AAS, GC-MS, TOC, Particle Analyzer, Viscometer, Polarimeter, Autotitrator, Dissolution Machine, DPI and MDI instruments

**Publications in the International referred Journals**

1. **Uddin, K. M.**; Alrawashdeh, A. I.; Henry, D. J., Warburton, P. L. Poirier, R. A. Hydrolytic Deamination Reactions of Amidine and Nucleobase Derivatives, *Journal of Quantum Chemistry*, **2020**, *120*: doi.org/10.1002/qua.26059.
2. **Uddin, K. M.**; Alrawashdeh, A. I.; Debnath, T.; Aziz, M. A.; Poirier, R. A. Synthesis, spectroscopic characterization, and theoretical studies on the substitution reaction of chromium(III) picolinate *Journal of Molecular Structure*, **2019**, *1189*, 28–39.
3. Kabir, H.; Rahman, M. M.; **Uddin, K. M.** Structural, Morphological, Compositional and Optical Studies of Plasma Polymerized 2-Furaldehyde Amorphous *Elsevier (Applied Surface Science)*, **2017** (accepted)
4. **Uddin, K.M.**; Henry, D. J., Alrawashdeh, I. A.; Warburton, P. L.; Poirier, R.A. Mechanism for the deamination of Ammeline, Guanine and their Analogues, Springer (*Struc. Chemistry.*), **2017**, *28*, 1467–1477.
5. **Uddin, K.M.**; Henry, D. J., Investigation of Mono-, Bis- and Tris-glycinatochromium(III): Comparisons of Computational and Experimental Results. Elsevier (*Polyhedron*), **2017**, *130*, 81–93.
6. **Uddin, K.M.**; Habib, A. M.; Henry, D. J. Investigating the thermal analysis and Electrochemistry properties for tris-(glycinato)chromium(III). Wiley- VCH (*ChemistrySelect*) **2017**, *2*, 1950–1958
7. **Uddin, K. M.**; Henry, D. J. Further Theoretical Studies of the Aquation of Chromium(III) Chloride Nutritional Supplement: Effect of pH and Solvation. Wiley-VCH (*ChemistrySelect*), **2016**, *1*, 5236–5249
8. **Uddin, K. M.**; Henry, D. J. Poirier, R. A.; Warburton, P. L. Calculated Bond Dissociation Energies and Enthalpy of Formation of alpha-Amino acid Radicals. Springer (*Theor. Chem. Acc.*), **2016**, *135*, 224
9. Almatarneh, M. H.; Abu-Saleh, A. A. A.; **Uddin, K. M.**; Poirier, R. A.; Warburton, P. L. A Computational Mechanistic Study of the Deamination Reaction of Melamine. *Int. J. Quantum Chem.* **2016**, *117*, 180–189
10. **Uddin, K.M.**; Raymond, A. Poirier; Henry, D. J.; Mechanistic study of the aquation of nutritional supplement chromium chloride and other chromium(III) Dihalides. Elsevier (*J. Comp. and theor. Chem.*), **2016**, *1084*, 88–97
11. **Uddin, K.M.**; Ralph, D.; Henry, D. J. Mechanistic investigation of halopentaaquachromium(III) complexes: comparison of computational and experimental results. Elsevier Journal. Elsevier (*J. Comp. and theor. Chem.*), **2015**, *1070*, 152–161
12. **Uddin, K.M.**; Flinn, C. G.; Poirier, R.A.; Warburton, P. L. Comparative computational investigation of the reaction mechanism for the hydrolytic deamination of cytosine, cytosine cyclobutane dimer and several 5,6-saturated. Elsevier Journal. *J. Comp. and theor. Chem.*, **2014**, *1027*, 91–102
13. Khan, M. W.; **Uddin, K.M.**; Ali, M.; Rahman, M. S.; Rashid, M. A.; Chowdhury, R. A convenient synthesis of new annelated pyrimidines and their biological importance, Wiley (*J. Heterocyclic Chem.*) **2014**, *51*, E216–E221.
14. **Uddin, K.M.**; Warburton, P. L; Poirier, R.A. Comparative computational and experimental thermochemical properties of common  $\alpha$ -amino acids. *American Chemical Society (J. Phys. Chem. B)* **2012**, *116*, 3220–34.

15. **Uddin, K.M.**; Poirier, R.A. Computational study of the deamination of 8-Oxoguanine *American Chemical Society (J. Phys. Chem. B)* **2011**, *115*, 9151–9159.
16. **Uddin, K.M.**; Almatarneh, M.H.; Shaw, D.M.; Poirier, R.A. Mechanistic study of the deamination reaction of guanine: A computational study. *American Chemical Society (J. Phys. Chem. A)* **2011**, *115*, 2065–2076
17. Rahman, K. M.; Chowdhury, A. Z. M.S.; Bhuiyan, M. M. H.; Hossain, M. K.; **Uddin, K.M.** Synthesis and antimicrobial activity of some heterocycles: Part- II *Pak J. Sci. Ind. Res.* **2003**, *46*, 95–98
18. Rahman, K. M.; Chowdhury, A. Z. M.S.; Bhuiyan, M. M. H.; Hossain, M. K.; **Uddin, K.M.** Synthesis and antimicrobial activity of some Heterocycles: Part – II. *North Ben. Uni. Rev. (Sci. & Tec.)* **2001**, *12*, 1–12

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### Training & Workshops

- **Entrepreneurial Research and Innovation Program** by **CERI**, Australia, February 2017
- **Laboratory Safety Training** in Science in **Murdoch University**, Australia on April 2014
- Graduate Research Integrity Program (**GRIP**) online module in **Murdoch University**, Australia on June 2014
- Graduate Research, Education and Training (**GREAT**) Program workshop in **Murdoch University**, Australia on April 2014
- Professional Skill Development Program (**PSDP**) training in **Memorial University, Canada** from September 2011 to November 2011
- **Teaching Opportunity Graduate Assistants Program** Level 2 on October, 2010 by Instructional Development Office of **Memorial University, Canada**
- **Lab Safety and W.H.M.I.S. Training** on October, 2009 by **Atlantic Safety Centre of Memorial University, Canada**
- **Training on Environment Control (Contamination Control)** in Bangladesh, June 15–16th, 2006 by APC (Asia Pacific Consultants Ltd.), **Australia**
- Training on HPLC, UV-Spectroscopy, FTIR, AAS, GC, TOC on Nov 2005 by **Plasma Plus** Ltd of Bangladesh
- Training on HPLC: Waters (Operation and Basic Troubleshooting) on March 15–18<sup>th</sup>, 2003 by **Technoworth Associate Ltd** of Bangladesh

### International Conference

- **iPREP WA** outcome on the project presentation at **Perth, WA** on the 11<sup>th</sup> April, 2017. Title of presentation: *Development of a unique weight loss supplement to support our digital health platform.*
- International Conference on Food Chemistry and Technology (**FCT-2016**) at **Las Vegas, USA** during 14–16<sup>th</sup> November, 2016. Title of presentation: *Investigation of the Biochemical Pathways of Antidiabetic Chromium(III) Supplements.*
- 16th Asian Chemical Congress (**16ACC**), **Dhaka, Bangladesh**, on 16–19<sup>th</sup> March, 2016. Title of presentation: *Kinetics and Mechanistic Investigation of the Biochemical Pathways of Antidiabetic Chromium(III) Supplements.*
- **RACI Physical Chemistry 2016 Conference, New Zealand, Australia**, on 2–5<sup>th</sup> February, 2016. Title of presentation: *Kinetic and Mechanistic Investigation of the Aquation of Chromium(III) Supplements.*
- Murdoch University **Open Day 2015**, oral demonstrations, Lab PS2.005, **Western Australia**, on 26<sup>th</sup> July 2015
- 12th Atlantic Theoretical Chemistry Symposium (**ATCS 2011**) in **UPEI, Canada**, on August 12–14<sup>th</sup>, 2011. Title of presentation: *Comparisons of computational and experimental thermochemical properties of common alpha-amino acids.*
- 94th Canadian Society of Chemistry (**CSC**) Conference and Exhibition (CSC 2011) in Palais de Congress, **Montreal, Canada**, on June 5–9<sup>th</sup>, 2011. Title of presentation: *Computational study of the deamination of 8-oxoguanine.*
- Atlantic Theoretical Chemistry Symposium (**ATCS 2010**) in **Halifax, Canada**, on August 13–15<sup>th</sup>, 2010. Title of presentation: *Mechanistic study of the deamination reaction of guanine: A computational study.*

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### Professional Memberships

- Member of the American Chemical Society (ACS) (2012 - till date)
- Member of the Chemical Institute of Canada (CSC) (2011 - till date)
- Member of the Bangladesh Chemical Society (2007 - till date)

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### Awards/Scholarships/Fellowships

- Industry and PhD Research Engagement Program Award, Western Australian Universities (**iPREPWA**), **Perth, Western Australia** February 2017
- The **Overall Best Graduate Poster Award** in ‘the graduate research students’ in the disciplines within the School of Engineering and Information Technology, **Murdoch University, WA**, 2017
- International Conference on Food Chemistry and Technology (**FCT-2016**) Award, **Las Vegas, USA**, November 2016



- **Conference Travel Award** from **Murdoch University, WA**, September 2016
- Prestigious Scholarships International Postgraduate Research Scholarships (**IPRS**) and Australian Postgraduate Research Award (**APA**), January, 2014, at **Murdoch University, WA, Australia**
- Murdoch University **Top-up Scholarship**, January 2014, **Perth, WA**
- **UPA** and **IPTA** Awards in Spring, 2013, **University of Wollongong, NSW, Australia**
- **Memorial Postgraduate Scholarship** from the School of Graduate Studies, **Memorial University, St. John's, Canada**, September 2009 to April 2013
- Supervisor provided **NSERC fund** of **Memorial University, Canada**, 2009-2013
- **Teaching Assistantship Scholarship**, 2009-2013 from the School of Graduate Studies, **Memorial University, St. John's, Canada**
- **Conference Travel Award** from **Memorial University, Canada**, June 2011
- Atlantic Computational Excellence Network (**ACENET**) **Conference Travel Award** (2010 and 2011)
- **TOGA 2 Fellowship** from the School of Graduate Studies, **MUN, St. John's, Canada**, Winter 2010
- **Bangladesh-Sweden Trust Fund** Travel Grant to pursue higher study at **Memorial University of Newfoundland, St. John's, Canada**, 2009
- **Fellowship for M.Phil thesis** by Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh, 2006

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## References and Collaboration

1. **Prof. Dr. Raymond A. Poirier**  
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