A.F.M. Towheedur Rahman

B.Pharm (RU), M.Pharm (RU), MSc (UK)

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CAREER AIM

Seeking an opportunity to develop career as an academic professional in pharmaceutical sector in order to deliver acquired knowledge, skills and abilities in a team oriented environment. This will provide the platform to develop while contributing to the success of the organisation aided by the versatile knowledge and lab-based research expertise in the field of pharmaceutical and biomedical sciences.

EDUCATION

February, 2012- August, 2013

M.Sc. in Drug Design and Discovery
(University of the West of Scotland, UK)
The core modules that were taught during this MSc programme are Drug Design and Development, Drug Discovery and Development, Computer Aided Drug Design, Pre-clinical Drug Testing, Drug Research Methods and Pharmaceutical Synthesis.
Area of dissertation: Medicinal Chemistry
Grade obtained: A (71%)
Award: Court Medal (an award for Distinction)

July, 2008 – June, 2009

Master of Pharmacy (M.Pharm)
(Rajshahi University, Bangladesh)
The relevant courses that were taught during this programme are Advanced Pharmacology and Toxicology, Molecular Biology and Biotechnology, Advanced Analytical Chemistry, Advanced Medicinal Chemistry, Advanced Pharmaceutical Engineering and Advanced Biopharmaceutics.
Area of thesis: General Pharmacology
Marks obtained: 72.875%(First Class)

July, 2004- June, 2008

Bachelor of Pharmacy (B.Pharm)
(Rajshahi University, Bangladesh)
A four-year programme that high-lighted on the modules that are taught in Pharmacy schools worldwide. Some of the important modules are: Physical Pharmacy, Pharmacognosy, Medicinal Chemistry, Pharmaceutical Engineering And Technology, Molecular Biology and Biotechnology, Pharmacology and Toxicology, Hospital and Community Pharmacy, Quality control,Qualityassurance and Validation.
Marks obtained: 67.812% (First Class)

2002-2004

Higher Secondary School Certificate (HSC)
(Saint Joseph Higher Secondary College, Dhaka, Bangladesh)
Scored GPA: “A” (4.30)

2000-2002	**Secondary School Certificate (SSC)** **(Dhaka Residential Model College, Dhaka, Bangladesh)** Scored GPA: "A" (4.25)

PROFESSIONAL EXPERIENCE

January, 2015-Up to the date	**Lecturer** **Department of Pharmaceutical Sciences, North South University, Bangladesh** Disciplines: Organic Chemistry, Biochemistry and Medicinal Chemistry
January, 2014-December, 2014	**Senior Lecturer** **(Department of Pharmacy, Southeast University, Bangladesh)** Disciplines: Advanced Pharmaceutical Analysis, Advanced Medicinal Chemistry, Boimolecular Pharmacy

RESEARCH EXPERIENCE

Metal Based Drug Design: A Combined Computational and Experimental Approach *(Co-investigator of B.Pharm thesis, Dept. of Pharmaceutical Sciences, North South University, 2016)*

Initial three-dimensional geometry of all drugs were retrieved from PubChem Open Chemistry Database. The parent drugs were modified with transition metals. These structures were fully optimized by density functional theory employing Becke's exchange functional combining Lee, Yang, and Parr's (LYP) correlation functional. Stuttgart/Dresden basis set (SDD) was used due to the presence of transition metals. After optimization, subsequent vibrational frequency calculation was performed to confirm that the stationary points correspond to minima on the Potential Energy Surface. Electronic energies, enthalpy, Gibbs free energies, and dipole moments and partial charge analysis of each compound were also investigated. All theoretical calculations were carried out using Gaussian 09 program package. To predict the chemical reactivity descriptor of all drugs, molecular orbital calculations were performed at same level of theory. Hardness and softness of all drugs were also calculated from the energies of frontier HOMOs and LUMOs.

Structure-based Design of Small Molecule Inhibitors of EZH2

(Principal investigator, Dept. of Pharmacy, Southeast University, 2015)

Here we report three potent inhibitors of EZH2, namely ezh2i19, ezh2i21 and ezh2i22. We designed these inhibitors using structure-guided approach. The inhibitors; ezh2i19, ezh2i21 and ezh2i22, bind to highly conserved active site of EZH2 with calculated binding affinity -7.2, -9.6 and -8.6 kcal/mol, respectively. The compounds exhibit substrate-competitive inhibitory mechanism by occupying the substrate peptide binding groove of EZH2, including the catalytic lysine-binding channel and may have the potential to be potent inhibitors of EZH2 with greater selectivity over other methyltransferases. The results provide

a rationale for further investigation of these compounds for therapeutic application in patients with relevant cancer and other diseases.

"Synthesis and characterization of non-steroidal estrone sulfatase (ES) inhibitors for the treatment of hormone dependent breast cancer in post-menopausal women"

(MSc research project in the field of Drug Design & Discovery, University of the West of Scotland, UK, 2013)

This research project involved the synthesis of a range of 4-hydroxyphenone-based ES inhibitors. The reactions resulted in low to excellent yield. For example, lowest yield (29%) was observed for compound **25** [1-(4-Hydroxyphenyl) propan-1-one] whereas highest yield (84%) was obtained for compound **36** [4-Butyrylphenyl trifluoromethanesulfonate]. Structure elucidation of the products, obtained during the synthesis of targeted compounds confirmed the successful synthesis of these compounds. For example, IR spectra for 4-hydroxyphenone derivatives (compound **25** to **29**) showed a broad peak within the range of 3600 cm^{-1} to 3200cm^{-1} which indicated the presence of hydroxy group in their structure. This peak was absent in case of methanesulfonated and trifluoromethanesulfonated derivatives (compound **30** to **39**) of 4-hydroxyphenones. From the GC-MS data, it was found that the retention time for each compound was different and the molecular ion peak (M^+) in each cases corresponded to the molecular weight of the respective compound. Finally, the ^1H NMR and ^{13}C NMR spectral data strongly supported the arguments in favour of the synthesis of desired compounds without generating unexpected isomers.

"Investigation of the beneficial effects of Nigella sativa linn. seeds oil on alloxan induced diabetic rats" *(M.Pharm thesis in the field of General Pharmacology, University of Rajshahi, Bangladesh, 2011)*

The thesis was aimed to observe the effects of combined dose of Nigella sativa oil (NSO) and pioglitazone on long-term alloxan-induced diabetic rats. Treatment with NSO recovered Langerhans cells from shrinkage whereas pioglitazone displayed slight recovery. But the combined therapy showed complete recovery of Langerhans cells as compared with diabetic rats. Combination of drugs significantly reduced the TC, TG and LDL-C level whereas improved the HDL-C level noticeably. Combination also increased DPPH free radical scavenging activity compared with diabetic rats. The research findings suggest that the treatment with combination therapy was more effective than mono-therapy for preventing diabetes.

TECHNICAL SKILLS

NMR (^1H & ^{13}C Nuclear Magnetic Resonance)
JEOL 400MHz
INFRA-RED SPECTRUM
Perkin Elmer Spectrum-1 (ATR Attachment FTIR spectroscopy)
GC-MS (Gas chromatography-Mass Spectroscopy)
Agilent Technologies (7820A GC System, 5975 Series MSD, and EI-350)
HPLC (High Performance Liquid Chromatography)
Both preparative and analytical by Shimadzu Corporation, Japan

HISTOLOGY OF ORGANS
Hematoxylin and eosin staining (H & E)
PYTHON
Programming Language
GAUSSIAN 09
Geometry optimization and parameterization
AUTODOCK VINA
Grid generation and automated docking
PYMOL
Molecular visualization tool

TRAININGS

November, 2016 — **Laboratory Animal Management & Different Bioassay (ICDDR,B)**
Animal house maintenance, ethical considerations, feeding and breeding techniques (mice, rats, guinea pigs and rabbits), injection through different routes, anaesthesia, autopsy, different bio-assays and disposal system.

July, 2010 — **Internship (Incepta Pharmaceuticals Ltd, Bangladesh)**
Four weeks' in-plant training that focused on CGMPs, quality control (QC),quality assurance (QA), microbiology, R&D, waste management and water treatment.

April, 2010 — **Training on "Emergency Management of Cardio-Pulmonary Resuscitation"**
(TMSS Medical College, Bogra, Bangladesh)

PUBLICATIONS

Journal Papers:

- Anayt Ulla, Mustafe Khalid Mohamed, Biswajit Sikder, **AFM Towheedur Rahman**, Farzana Akther Sumi, Murad Hossain, Hasan Mahmud Reza, G. M. Sayedur Rahman and Md Ashraful Alam. Coenzyme Q10 prevents oxidative stress and fibrosis in isoprenaline induced cardiac remodeling in aged rats, *BMC Pharmacology and Toxicology* (2017) 18:29
- Abdullah Al Mamun, Mahbubul Hossain, Md. Sahab Uddin, Md. Tanjir Islam, Sajjad Hossain, Md. Sarwar Hossain, Md. Farhad Hossain, Ataur Rahman Sujan, Mamunur Rashid, Md. Mahbubur Rahman, **A. F. M. Towheedur Rahman**. Comparison of the Hypoglycemic, Hypolipidemic and Hepatoprotective Effects of *Asparagus racemosus* Linn. in Combination with Gliclazide and Pioglitazone on Alloxan-Induced Diabetic Rats, *Pharmacology & Pharmacy*, 2017, 8, 52-74
- Md. Tanjir Islam, Md. ShahidSarwar, **A. F. M. Towheedur Rahman**, Md. Asaduzzaman, Yusuf Ali, ShahedaZannah and Mamunur Rashid. Fenofibrate Potentiates the Antihyperglycemic, Antidyslipidemic and Hepatoprotective Activity of Pioglitazone in Alloxan-Induced Diabetic Rats, *British Journal of Pharmaceutical Research,* 2016, *9(6): 1-9*
- MajidulHaque, Mst. Marium Begum, MoynulHasan, **A. F. M. Towheedur Rahman**,Md. IftekharHussain, Mohammad Mizanur Rahman, Md. Hazrat Ali, Md. Ashraful Islam, Md. Zakir Sultan, Md. Reyad-ul- Ferdous, ChoudhuryMahmoodHasan. Investigation of the Medicinal Potentials of

Syzygiumjambos (L.) Extract and Characterization of the Isolated Compounds. *American Journal of Bio Science*, 2015; 3(2-1): 12-18

- TanbirAhammad, Marium Begum, **A. F. M. Towheedur Rahman**, MoynulHasan,SaikatRanjan Paul, ShailaEamen, Md. IftekharHussain, Md. HazratAli,Md. Ashraful Islam, Mohammad Mizanur Rahman, Mamunur Rashid. Formulation and *In-Vitro* Release PatternStudy of Gliclazide Matrix Tablet. *Pharmacology & Pharmacy*, 2015, 6, 125-131
- M.M. Begum, **A.F.M.T. Rahman**, Saiful Islam, Md. Asaduzzaman, Hazrat Ali, Yusuf Ali, ShahedaZannah, A.H.M.K. Alam, M.A.A. Rahman, M. Rashid. Simvastatin Potentiates the Antihyperglycemic, Antidyslipidimic and Antioxidative Effect of Glibenclamide on Alloxan-Induced Diabetic Rats. *Pharmacology & Pharmacy*, 2014, 5, 1059-1069
- S. Zannah, M.S. Islam, **A.F.M.T. Rahman**, M. Asaduzzaman, A.A.A. Bari, Y. Ali, G.J. Islam, A.H.M.K. Alam, H. Ali, M. Rashid. Antidiabetic Drugs in Combination with Hydroxychloroquine Improve Glycemic Control in Alloxan Induced Diabetic Rats. *Pharmacology & Pharmacy*, 2014, 5, 725-735
- M.H. Ali, **A.F.M.T. Rahman**, M.S. Islam, A. Mamun, S. Zannah, A.H.M.K. Alam, M.A.A. Rahman, M. Rashid. Combined Therapy of Pioglitazone and Atorvastatin Alleviate Diabetes in Rats More Effectively than That of Mono Therapy. *Pharmacology & Pharmacy*, 2014, 5, 504-513
- **A.F.M.T. Rahman**, M.S. Islam, M.H. Ali, A.H.M.K. Alam, M.A.A. Rahman, M.G. Sadik and M. Rashid. *Nigella sativa*Oil potentiates the Effects of Pioglitazone on Long Term Alloxan-Induced Diabetic Rats. *Bangladesh Pharmaceutical Journal; 16(2): 143-151, 2013*

Conference Paper

- Md. Mahbubur Rahman, Md. Abdullah Potol, Sourov Roy, Saiky Jahan Elona, Abir Hossain, Rifat Sultana, Mahabub Alam, Zaki Forhad Habib, Rasiqh Wadud, **A. F. M. Towheedur Rahman**. Coenzyme Q10 Ameliorates Hyperlipidemia Induced Brain Oxidative Stress and Inflammation. 23rd *International Scientific Conference on Sport*, Medical and Health Sciences. Article ID: 05-23rd ISCSMHS-17

PROFESSIONAL AFFILIATION

Registered "**A**" grade pharmacist by Bangladesh Pharmacy Council (BPC)
Registration No.: A-4309

EXTRA-CURRICULAR ACTIVITIES

January, 2015-Up to the Date **Member, Laboratory Maintenance Committee**
Department of Pharmaceutical Sciences, North South University

January, 2014-December 2014	**Active member of Laboratory Development Committee** Department of Pharmacy, Southeast University, Dhaka, Bangladesh **Active member of Seminar/Symposium Organizing Committee** Department of Pharmacy, Southeast University, Dhaka, Bangladesh **Convener of Internship Organizing Committee** Department of Pharmacy, Southeast University, Dhaka, Bangladesh
February, 2012 to January, 2013	**Class representative** (MSc in Drug Design and Discovery) University of the West of Scotland, UK

LANGUAGE SKILL

BENGALI
Native speaker
ENGLISH
IELTS (Academic) Date of Exam: 24/09/2016
Band Score 7.5 (Listening: 8.0 Reading: 8.0 Writing: 6.5
Speaking:7.5)

REFERENCES

Professor Mamunur Rashid
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