Dr. Monalisa Mukherjee, FRSC

Director, Amity Institute of Click Chemistry Research and Studies (AICCRS)
Professor, Amity Institute of Biotechnology (AIB)
Amity University, Noida Sector 125, UP 201303, India
Webpage: *www.amity.edu/aiccrs*

Phone: (0120) 458 6945 , +91 987 327 9964 **Email: mmukherjee@amity.edu**

Prof. Monalisa Mukherjee is the Director of Amity Institute of Click Chemistry Research and Studies (AICCRS) and Professor of Amity Institute of Biotechnology (AIB) at Amity University Noida. Her research focuses on diverse background like chemical biology, catalysis, material science and drug delivery. She aims towards the development of functional molecules of use to humankind with various approaches, among which the biomimetics or bio-inspired is one of the most significant routes. She is also trying to introduce artificial molecules (designed based on an understanding of in vivo reactions) into living cells to examine the chemical reactions within living organisms. She has established Biomimetics and Nanostructured Materials Laboratory (AIB) which focuses on diverse background like chemical biology, catalysis, material science and drug delivery. She conducts research at the intersection of chemical, electrical, and biological engineering as well as materials, biological, and physical sciences. The major aim lies in exploring innovative technologies in nanoscale manipulation and design at a molecular scale which has the potential for societal impact in areas such as energy, health care, and the environment.

Research mainly focuses on

1. A primary focus of her lab is to design and engineer Nano materials with precisely controlled optoelectronic properties. Graphene based zero dimensional materials bestowed with unique rewards of high crystallinity, high photobleaching threshold, water solubility, chemical stability, high quantum efficiency, narrow absorption and wide emission spectral profiles, exceptional biocompatibility aims to afford long term bioimaging and multiplexing, targeted, cavernous anatomical penetration and low scattering making them indispensable in the bioimaging arena and label free detection method.

2. She is working towards developing a variety of physically cross linked, pH sensitive SMART hydrogels and their Nano-composites with exotic nanostructure along with tunable formulations, possessing microporous interiors, resembling a honeycomb framework. Although there is often a design trade-off between effective drug delivery and favourable physicochemical properties, she has been engaged in research that address pitfalls in transdermal drug delivery, gene delivery, wound healing and soft tissue repair with controllable drug release at a pH and tissue engineering. Fluorescent gels developed in her lab intend to be highly efficacious for an improved chemotherapy to specific tissues and cell subpopulations by reducing side effects. 3. She is also interested on heteroatom doped 2D nanomaterials as photocatalyst as platform for sustainable lipid and biomass production from algae.

Education and Training

2006	Ph. D., Center for Bio-Medical Engineering, Indian Institute of Technology, Delhi, INDIA
1997-1999	M.Sc. in Chemistry (specialization in Organic Chemistry) University of North Bengal, West Bengal
1993-1996	B.Sc. (Honors) in Chemistry University of North Bengal, West Bengal

Professional Experience

July 2018	: Professor, Amity Institute of Biotechnology (AIB), Amity University Uttar Pradesh
January 2016	: Director, Amity Institute of Click Chemistry Research and Studies (AICCRS), Amity University Uttar Pradesh
May 2015	: Associate Professor, Amity Institute of Biotechnology (AIB), Amity University Uttar Pradesh
September 2010	: Assistant Professor, Amity Institute of Biotechnology (AIB), Amity University Uttar Pradesh
April 2009	: Senior Lecturer, Amity Institute of Biotechnology (AIB), Amity University Uttar Pradesh
April 2008	: Lecturer, Amity Institute of Biotechnology (AIB), Amity University Uttar Pradesh
December 2005	: Project Associate, Center for Bio-Medical Engineering, Indian Institute of Technology, Delhi, INDIA
March 1999	: Research Assistant, Indian Association of Cultivation of Science, Jadavpur, Kolkata

Selected Publication

1. Garg P., Sangam S., Kochhar D., Pahari S., Kar C., **Mukherjee M*.** Exploring the role of triazole functionalized Hetero atom co-doped carbon quantum dot against humancorona-virus. ***Nano Today***, 2020, *35*, 1010001. **(IF: 17)** https://doi.org/10.1016/j.nantod.2020.101001.

2. Singh, A.; Kochhar, D; Jeevanandham, S.; Kar, C; Bhattacharya, R.; Shakeel, A; and **Mukherjee, M*** Emergence of heptazine based graphitic carbon niride within hydrogel nanocomposites for scarless healing of burn wounds." ***ACS Applied Polymer Materials* . 2020,** *2*, 12, 5743-5755 (**IF: 10.5**)

3. Shakeel A., Bhattacharya R., Jeevanandham S., Kochhar D., Singh A., Ghufran M., Mehra L., Garg P., Sangam S., Biswas S., Tyagi A., Kalyanasundaram K., Chakrabarti S., **Mukherjee M***. Graphene Quantum Dots in the game of directing polymer self-assembly to exotic Kagomé Lattice and Janus Nanostructures. ***ACS Nano***, **2019,** 13*(8)*, 9397-9407. (**IF: 14.6**)

4. Singh, A.; Bhattacharya, R.; Shakeel, A.; Sharma, A.; Jeevanandham, S.; Kumar, A.; Chattopadhyay, S.; Bohidar, B. H.; Ghosh, S.; Chakrabarti, S.; Rajput, K. S.; and **Mukherjee, M*** Hydrogel Nanotube with Ice Helix as Exotic Nanostructure for Diabetic Wound Healing. ***Mater. Horiz.*** **2019,** *6*, 274-284. (**IF: 14.4**) **Came as Cover page**

5. Sangam, S.; Gupta, A.; Shakeel, A.; Bhattacharya, R.; Sharma, A.; Suhag, D.; Chakrabarti, S.; Garg, S.; Chattopadhyay, S.; Basu, B.; Kumar, V., Rajput, S. K., Dutta, M. K.; **Mukherjee, M***. Sustainable Synthesis of Single Crystalline Sulphur-Doped Graphene Quantum Dots for Bioimaging and Beyond. ***Green Chem.*** **2018,** 20, 4245. (**IF: 9.4**) **Came as Cover Page**

6. Khanra, A.; Sangam, S.; Shakeel, A.; Suhag, D.; Mistry, S.; Rai, M.; Chakrabarti, S.; **Mukherjee, M***. Sustainable Growth and Lipid Production from Chlorella Pyrenoidosa Using N-Doped Carbon Nanosheets: Unravelling the Role of Graphitic Nitrogen. ***ACS Sustain Chem Eng.*** **2018**, *6*, 774-780. (**IF: ~ 7.6**)

7. Shakeel, A.; Singh, A.; Das, S.; Suhag, D.; Sharma, A.; Rajput, S.; **Mukherjee, M*.** Synthesis and Morphological Insight of New Biocompatible Smart Hydrogels. ***J. Polym. Res.*** **2017**, *24*. (**IF: 2.4)**

8. Kaur, N.; Sharma, A.; Shakeel, A.; Kumar, V.; Singh, A.; Gupta, A.; Suhag, D.; Rajput, S.; **Mukherjee, M***. Therapeutic Implications of Superoxide Dismutase and Its Importance in Kinase Drug Discovery. ***Curr Top Med Chem.*** **2017**, *17*. (**IF: 3.4)**

9. Suhag, D.; Kumar Sharma, A.; Rajput, S.; Saini, G.; Chakrabarti, S.; **Mukherjee, M***. Electrochemically Synthesized Highly Crystalline Nitrogen Doped Graphene Nanosheets with Exceptional Biocompatibility. ***Sci Rep*** **2017**, *7*, 537. Doi:10.1038/s41598-017-00616-8 (**IF: 4.0)**

10. Suhag, D.; Sharma, A.; Patni, P.; Garg, S.; Rajput, S.; Chakrabarti, S.; **Mukherjee, M***. Hydrothermally Functionalized Biocompatible Nitrogen Doped Graphene Nanosheet Based Biomimetic Platforms for Nitric Oxide Detection. ***J. Mater. Chem. B*** **2016**, *4*, 4780-4789. (**IF: 5.4)**

11. Mazumdar, P.; Rattan, S.; **Mukherjee, M***. Polymer Nanocomposites using Click Chemistry: Novel Materials for Hydrogen Peroxide Vapor Sensors. ***RSC Adv.*** **2015**, *5*, 69573-69582. (**IF: 3.049)**

12. Suhag, D.; Bhatia, R.; Das, S.; Shakeel, A.; Ghosh, A.; Singh, A.; Sinha, O.; Chakrabarti, S.; **Mukherjee, M***. Physically Cross-Linked Ph-Responsive Hydrogels with Tunable Formulations for Controlled Drug Delivery. ***RSC Adv.*** **2015**, *5*, 53963-53972. (**IF: 3.0)**

13. Suhag, D.; Singh, A.; Chattopadhyay, S.; Chakrabarti, S.; **Mukherjee, M***. Hydrothermal Synthesis of Nitrogen Doped Graphene Nanosheets from Carbon Nanosheets with Enhanced Electrocatalytic Properties. ***RSC Adv.*** **2015**, *5*, 39705-39713. (**IF: 3.0)**

14. Chakraborty, A.; Patni, P.; Suhag, D.; Saini, G.; Singh, A.; Chakrabarti, S.; **Mukherjee, M***. N-Doped Carbon Nanosheets with Antibacterial Activity: Mechanistic Insight. ***RSC Adv.*** **2015**, *5*, 23591-23598. (**IF: 3.0)**

15. **Mukherjee, M**.; Ray, A. Nitric Oxide Synthase-Like Activity of Ion Exchange Resins Modified with Iron (III) Porphyrins in The Oxidation of L-Arginine by H_2O_2: Mechanistic Insights. ***Catal Commun.*** **2007**, *8*, 1431-1437. **(IF: 3.6)**

16. Mukherjee, M.; Ray, A. Biomimetic Oxidation of L-Arginine with Hydrogen Peroxide Catalyzed by the Resin-Supported Iron (III) Porphyrin. ***J. Mol. cat A: Chemical.***2007, 266, 207-214. **(IF: 3.6)**

17. Wadhwani, P.; **Mukherjee, M**.; Bandyopadhyay, D. The Prime Reactive Intermediate in the Iron (III) Porphyrin Complex Catalyzed Oxidation Reactions by tert-Butyl Hydroperoxide. ***J. Am. Chem. Soc.*** **2001**, *123*, 12430-12431. (**IF: 14.357)**

Inventions, Patents, Copyrights

1. "Process for preparation of Iron (III) porphyrin catalyst immobilized on Dowex resin and its application thereof in biomimetic oxidation", **Mukherjee, M**.; Indian Patent Appl. (2011) No. **813/DEL/2009**. Patent No. : 289167, **Granted on 2/11/2017**

2. "Regiospecific oxidation of C-M bond of organometallic compound with hydrogen peroxide using chiral iron(III) salen complexes as catalyst", **Mukherjee, M**.; Srivastava, A. K.; Indian patent Appl. (2011) No. **1098/DEL/2009, Granted on 24/5/2018**

3. "Development of novel nanocomposites as chemical sensor using functionalized graphite nanoparticles, and grafted polymers through chemical ligation, **Rattan, S**.; **Mukherjee. M**; Moses, E. J.; Indian patent Appl. (2012) **806/DEL/2012**, **Granted on 15/10/2019**

4. "N-doped carbon nanosheet based hydrogel composite for wound healing", Singh A.; Shakeel A.; **Mukherjee M.**; Chakrabarti; Rajput S.K; Bohidar H.B.; Rawat K. (2018) **E-101/41081/2018-DEL** Application number 201811021906. **CRN: 2944**

5. "Graphene based chemical sensor for the detection of toxic heavy metal complexes in drinking water, Chakraborti, S.; **Mukherjee. M**.; Moses, E. J.; Indian patent Appl. (2012) **1030/DEL/2012**. **Granted on 1/01/2020**

6. "Method for preparation of highly fluorescent biocompatible sulphur doped graphene quantum dots from affordable agro-industrial bio-waste cane molasses using hydrothermal synthesis for bioimaging application" Gupta A.; Shakeel A.; Sangam S.; Suhag D.; Kumar V.; Bhattacharya R.; Sinha O.P.; Chakrabarti S.; **Mukherjee M.** (2017) **E-101/27108/2017-DEL** Application number 201711016713. **CRN: 2462**

7. "Graphene quantum dots-based hydrogel nanocomposites for site specific sustained drug release", Shakeel A.; Singh A.; Bhattacharya R.; **Mukherjee M**. (2019) **E-101/24523/2019-DEL** Application number 201911011659**. CRN: 332**

8. "Hydrogels for transdermal drug delivery and a method to manufacture the same", Suhag, D.; Bhatia, R.; Das, S.; Shakeel, A.; Ghosh, A.; Singh.; Chakrabarti, S.; **Mukherjee, M**.; Indian patent Appl. (2015) **1388/DEL/2015**.

9. “The alkali metal tertiary butoxide promoted, thiazolium salt, catalysed synthesis of electron deficient amides”, Moses, E. J.; Burnley V. J.; Carbon, G.; Indian patent Appl. (2012) **3453/DEL/2012**.

10. “Efficient organic photovoltaic devices based on photoactive graphene and semiconductor nanoparticles, Chakraborti, S.; Sinha. O.P.; Moses, E. J.; **Mukherjee, M**.; Indian patent Appl. (2012) **1029/DEL/2012**.

Book Chapters

1. “Carbon nanosheets for sustainable production of bioactive compounds from micro algae: Divine approach in drug discovery” Chapter 1, Volume II, *Animal Screening Basics of Drug Discovery*

Projects/Funding

2020 - Approved
Title: Iron and zinc biofortification of cereals and vegetables for enhancing micronutrient bioavailability in soil-plant system

Funding: Department of Biotechnology (DBT)

Rs. 95,00,000/-

Role: Co- Principle Investigator (PI)

2021 - Approved
Title: Enzyme Bioanode for Electricity Generation by Oxidizing Phenolics in Enzymatic Fuel Cell

Funding: Department of Biotechnology (DBT)

Rs. 36,52,000/-

Role: Co-Principle Investigator (PI)

2018 - Ongoing
Title: Near infra-red editing graphene quantum dots in bioimaging and theranostics

Funding: Department of Science and Technology (DST)

Rs. 44,95,480/-

Role: Principle Investigator (PI)

2018 - Ongoing
Title: Smart Hyaluronic Acid hybrid hydrogels via Click chemistry for wound healing

Funding: DBT

Rs 40,84,800/-

	Role: PI
2016 - Ongoing	Title: To optimize the uptake of carbon nanomaterials within the cell and to investigate radio sensitization
	Funding: Inter University Accelerator Centre (IUAC)
	Rs: Beamline and Instrumentation Facilities
	Role: Principle Investigator (PI)
2016 - Ongoing	Title: Metal Oxide decorated doped Carbon Nanosheet for detection of Arsenic in Ground water
	Funding: University Grant Commission (UGC) - Department of Atomic Energy (DAE) CSR, Indore
	Rs. 1000000
	Role: Principle Investigator (PI)
2015-2016 –	Title: In-vivo evaluation of zaubrol against alopecia
Consultancy	Funding: Dr. Willmar Schwabe India Private Limited (Consultancy Project)
	Rs. 25000
2010-2014-	Title: Development of Nitric Oxide synthase mimetic
Completed	material and its application as biosensor
	Funding: Department of Science and Technology (DST)
	Rs. 1980000
	Role: Principle Investigator (PI)

Collaborators

Research group has national and international collaborative partners for the synthesis of novel Nano materials and their targeted delivery in living system that aims to address the bottlenecks in drug delivery and bioimaging and to understand biophysicochemical interactions dictated by the cues from the microenvironment at the Nano–bio interface.

1. John Hopkins University, USA

2. La Trobe Institute for Molecular Science, La Trobe University, Melbourne, Australia

3. Nottingham University, Nottingham, UK

4. Jawaharlal Nehru University, New Delhi

5. All India Institute of Medical Sciences, New Delhi

6. Indian Institute of Technology Delhi, New Delhi

7. Inter-University Accelerator Centre, New Delhi

8. Rajiv Gandhi Centre for Biotechnology, Kerala

Research Program Building

1. Course Co-Ordinator for B.Tech courses, Amity Institute of Biotechnology, Amity University, Noida

18. Chairperson for admission interviews, Amity Institute of Biotechnology, Amity University, Noida

Selected Conference Presentations

November 2020 **Invited Talk** in a **National Conference** Present and future of Drug Delivery approaches and Molecular Medicine" (November 19- 20, 2020) Department of Life Science, NIT Rourkela

November 2020 **Chairing a session** in **CRSI National Chemistry Week celebration** (1-7 November 2020) one-day Seminar (virtual mode) on "**Women Scientist in Chemical Science"** scheduled to be held on 5th November, 2020, Department of Chemistry, University of North Bengal.

October 2019 **Invited Talk** in a **National Conference on Surfactants, Emulsions and Biocolloids, (NATCOSEB-2019),** Amity University, Kolkata, India.

December 2018 **Invited Talk** in An International Conference cum Expo **Innovation In Materials Science& Technology, IMST 2018**, Amity University, Kolkata, India.

March 2016 **Invited Talk** in **National Conference on Nanotechnology in Agriculture, Energy and Medicine** held in Centre for Nano Sciences, Central University of Gujarat, Gandhinagar, INDIA

December 2015 **Invited talk** in **Energy, materials and nanotechnology (EMN) Hong Kong Meeting**, at Hong Kong

December 2015	**Invited talk** in "Recent Trends in Nano-Bio interface" at JNU, New Delhi, INDIA
May 2015	**Invited talk** in Asian Network for Natural and Unnatural Materials 4 (**ANNUM 4 2015**)
August 2014	**Invited talk** in International Conference on Advancement in Materials, Health and Safety Towards Sustainable Energy and Environment, (**MHS-2014**) organized by IJAA and AERB Chennai, INDIA
June 2012	**Invited talk** in **UK-India Research Partnerships Forum** Organized by Nottingham University, British council and Manipal University in India Habitat Centre New Delhi, INDIA
July 2014	**Invited talk** in "Carbon nanosheets and their potential applications" at **International Conference on Advancement in Materials, Health and Safety Towards Sustainable Energy and Environment**, Indira Gandhi Centre for Atomic Research (IGCAR), INDIA
June 2012	**Invited talk:** "Sustainability Inspired Research & Teaching: Ancient Wisdom, Modern World" Mukherjee, M.; **UK-India Research Partnerships' Forum** being organized by Nottingham University, British council and Manipal University in Indian Habitat Center New Delhi, INDIA
May 2010	Attended **2nd Global Industrial R & D Conclave** on the occasion of National Technology Day, Indian Habitat Center, New Delhi, INDIA
May 2010	Attended **5th Nanotechnology Conclave** organized by CII, Hotel Taj Palace, New Delhi, INDIA
July 2009	**Oral presentation**: "Iron (III) porphyrin supported on dowex resin as a heterogeneous catalyst for alkene epoxidation and alkanes hydroxylation with hydrogen peroxide", Mukherjee, M.; Ray, A. R.; **International Symposium on Metallomics** , held at Cincinnati, Ohio, USA
June 2008	**Poster presentation**: "Iron (III) porphyrin immobilized on dowex resin as biomimetic alkene epoxidation and alkane hydroxylation catalyst with sodium periodate", Mukherjee, M.; Ray, A. R.; **8th World Biomaterials Congress**, Amsterdam, Netherlands
February 2006	**Poster presentation**: "Biomimetic Oxidation of L-arginine with hydrogen peroxide catalyzed by iron porphyrin supported on polymer matrix", Mukherjee, M.; Ray, A. R.;

	XVI Conference of Society for Biomaterials and Artificial Organs, New Delhi, INDIA
December 2004	**Oral Presentation**: "Development of NO synthase mimetic material: Synthesis and characterization of water soluble porphyrin", Mukherjee, M.; Ray, A. R.; **International Symposium on Advanced Materials and Processing (ISAMAP 2K4)**, held at I.I.T Kharagpur, INDIA
December 2001	**Paper Presentation**: "Efficient trapping of reactive intermediates in the reactions of Iron (III) porphyrins with various oxidants", Bagai, R.; Mukherjee, M.; Bandyopadhyay, D.; Bandyopadhyay, D.; **MTIC-IX** held in IACS, Kolkata, INDIA

Teaching

2019 - till date	Teaching "M**aterial Science**" to undergraduates and postgraduates
2014- till date	Teaching "**Biomaterial Science**" to undergraduates
2012- till date	Teaching "**Chemistry for Engineers**" to undergraduates
2009-2010	Taught "**Drug Design and Development**" to postgraduates
2008-2010	Taught "**Chemical Biology**" to undergraduates
2008-2010	Taught "**Bio-analytical Techniques**" to undergraduates
2008-2010	Taught "**Pharmaceutical Chemistry and Drug Design**" to postgraduate

Mentoring

2021-ongoing	Rahul Patel (Ph. D.), Amity Institute of Click Chemistry Research and Studies, Amity University, Noida
2019-ongoing	Misba Mazood (Ph. D.), Amity Institute of Click Chemistry Research and Studies, Amity University, Noida
2017-ongoing	Akankshaa Agarwal (Ph. D.), Amity Institute of Click Chemistry Research and Studies, Amity University, Noida
2016- 2020	Aarti Singh (Ph. D.), Amity Institute of Click Chemistry Research and Studies, Amity University, Noida. **Awarded**
2016- ongoing	Sujata Sangam (Ph. D.), Amity Institute of Biotechnology, Amity University, Noida.
2015- 2019	Adeeba Shakeel (Ph. D.), Amity Institute of Biotechnology, Amity University, Noida, **Awarded**

2013-2016	Payal Majumder (Ph. D.), Amity Institute of Applied Sciences, Amity University, Noida. **Awarded**
2013-2016	Deepa Suhag (Ph. D.), Amity Institute of Biotechnology, Amity University, Noida. **Awarded**

Journal Peer Review/Professional Activities

2018- present	Editorial Board Member, *Scientific Reports*, Nature Publishing Group
2017- present	*Nature Communications*
2015- present	*RSC Advances*
2015- present	*Nature Scientific Reports*
2015- present	*Nanoscale*
2015- present	*Journal of Material Chemistry Part B*
2015- present	*ACS Applied Material and Interfaces*
2015- present	*Chemical Communications*
2019- Present	*Advance Functional Materials*

Life Membership − Chemical research Society of India.

Membership number is LM 2434.

Annual Membership − American Chemical society (ACS), USA.

Annual Membership − Royal Society of Chemistry (RSC) UK.

Recognition

1. Received the prestigious Fellow of the Royal Society of Chemistry (FRSC) Membership ID: 692448

2. Received Distinguished Visiting Scientist Award for the year 2011 from University of Nottingham, United Kingdom.

3. Received DST Fast Track Project on "Development of NO-synthase mimetic materials and its application as biosensor. "Amount of grant – Rs.19,80,000/-(March 2010)

4. Foreign Travel grant from Department of Science and technology and Indian National Science Academy for presenting research paper at the 8th World Biomaterials Congress, Amsterdam, 28 May - 1 June 2008.

5. Best poster presentation award in XVI Conference of Society for Biomaterials and Artificial Organs, New Delhi, INDIA, February 24-26, 2006.

6. Excellent oral presentation certificate received in International Symposium on 6. Advanced Materials and Processing (ISAMAP 2K4), held at I.I.T Kharagpur, INDIA, December 2004.

7. Qualified NET-LS (2001) and obtained SRF from C.S.I.R, Human Resource Development group in 2002.

8. Scholarship from Ministry of Human Resource & Development (MHRD) for pursuing Ph. D in IIT Delhi

9. Qualified Graduate Aptitude Test in Engineering (GATE– 92.5 percentile) in 1998, Subject-Chemistry.

10. National Scholarship award under Govt. of India scheme 1995-96.