ACADEMIC DEPARTMENT

FACULTY ACADEMIC PROFILE/CV

1. **Full Name of the faculty Member: Dr. Mijanur Rahaman Molla**
2. **Designation**: Assistant Professor
3. **Specialization**: Organic Chemistry
4. **Passport size photograph:**

5. **Contact information**: Rashbehari Siksha Prangan (Commonly known as Rajabazar Science College), 92, Acharya Prafulla Chandra Road, Kolkata – 700009

   Phone no. +91-9239018512

   E-mail ID: mija.chem@gmail.com

   : mrmchem@caluniv.ac.in

   URL: Goole Scholar: https://scholar.google.co.in/citations?user=xNJ5hGYAAAAJ&hl=en

   Webpage: http://mijachem.wixsite.com/mrmlab

6. **Academic qualifications:**

College/ university from which the degree was obtained	**Abbreviation of the degree**
Vivekananda College, University of Calcutta	B. Sc.
University of Calcutta	M. Sc.
Indian Association for the Cultivation of Science	Ph. D.

7. Positions held/holding:

- December, 2022-February, 2023: Humboldt Visiting Scientist at Karlsruhe Institute of Technology, Germany
- March, 2018-March, 2019: Humboldt Visiting Scientist at Karlsruhe Institute of Technology, Germany
- December, 2016-till date: Assistant Professor, Chemistry, University of Calcutta
- September, 2015-December, 2016: Alexander von Humboldt Postdoctoral fellow at Karlsruhe Institute of Technology, Germany.
- June, 2013-June, 2015: Postdoctoral research fellow at the University of Massachusetts, Amherst, USA
- November, 2012: Visiting scholar in the group of Prof. T. Pradeep at IIT, Chennai

8. Research Interests:

- High-throughput synthesis of lipidoid, peptoid and polymers using combinatorial Chemistry
- High-throughput screening towards gene transfection
- Self-immolative polymer synthesis, self-assembly study and drug delivery applications
- Surface patterning and functionalization for material as well as biological applications

9. Research guidance: i) One PhD student received degree
ii) 5 PhD students are currently pursuing their PhD under my guidance
ii) 5 students completed their short term project work
iii) 12 students completed their master thesis

10. On-going/Completed Projects: 1) UGC Start UP Grant (Sanctioned 10 lakh for 2 years, Completed)

2) DST Early Career Research Award (Sanctioned ~45 lakh for 3 years, Completed)
3) DST (TARE) Award (Sanctioned ~9 lakh for 3 years) (November, 2022-October, 2025)

11. Full list of publications:

A) Journals:

38. A. Mondal, S. Das, S.M Ali, S. Kolay, A. Sengupta, **M.R Molla (2023)** Bioderived Lipoic Acid-Based Dynamic Covalent Nanonetworks of Poly (disulfide) s: Enhanced Encapsulation Stability and Cancer Cell-Selective Delivery of Drugs. *Bioconjugate Chemistry*, **00**, 00 (just accepted) (Accepted for the front Cover Page)

37. S. Kolay, A. Mondal, S.M Ali, S. Santra, M.R Molla. Photoswitchable polyurethane based nanoaggregates for on-command release of noncovalent guest molecules. *Journal of*

Macromolecular Science, Part A, **59**, 838-848 (**I. F. 2.58**)

36. S. Santra, A. Ghosh, A. Mondal, S.M Ali, D. Das, K. Sarkar, L. Roy, **M.R Molla (2022**) Stabilizing Entropically Driven Self-Assembly of Self-Immolative Polyurethanes in Water: A Strategy for Tunable Encapsulation Stability and Controlled Cargo Release. *ACS Applied Polymer Materials* **4**, 7614-7625. (**I. F. 4.52**)

35. S. Santra, S. Kolay, S. Sk, D. Ghosh, A. Mishra, L. Roy, K. Sarkar, **M. R. Molla (2022)** Supramolecularly cross-linked nanoassemblies of self-immolative polyurethane from recycled plastic waste: high encapsulation stability and the triggered release of guest molecules. *Polymer Chemistry*, **13**, 3294-3303. (**I. F. 5.58**)

34. Sk M. Ali, S. Santra, A. Mondal, S. Kolay, L. Roy, **M. R. Molla (2022**) Self-Immolative Polyurethane Based Nanoassemblies: Surface Charge Modulation at Tumor Relevant pH and Redox Responsive Guest Release. *Polymer Chemistry*, **13**, 558-568. (**I. F. 5.58**)

33. Sk A. Ali, A. Bera, S. K. Manna, S. Santra, **M. R. Molla**, S. Samanta. (**2020**) First Example of Copper(I) Catalyzed Decarboalkoxymethylation of Alkyl 2-[1-(Pyridin-2-yl)-1H-pyrrol-2-yl] acetates. *European Journal of Organic Chemistry*, **18**, 2754. (**I. F. 2.88**)

32. Santra, S., Ali, S. M., Mondal, A., **Molla, M. R**. **(2020**) Self-Immolative Polyurethane Based Nanoassemblies: Surface Charge Modulation at Tumor Relevant pH and Redox Responsive Guest Release. *Langmuir*, **36**, 8282. (**I. F. 3.68**)

31. **Molla, M. R**., Chakraborty, S., Sagredo, L-M., Drechsler, M., Rousseau, V-O., Levkin, P. A., (**2020**) Combinatorial Synthesis of a Lipidoid Library by Thiolactone Chemistry: In Vitro Screening and In Vivo Validation for siRNA Delivery. *Bioconjugate Chemisry*, **31**, 852. (**I. F. 4.8**)

30. M. Benz, **M. R. Molla**, A. Böser, A. Rosenfeld, P. A. Levkin* (**2019**). Marrying chemistry with biology by combining on-chip solution-based combinatorial synthesis and cellular

screening. *Nat. Commun*., **10**, 2879. (**I. F. 11.88**)

29. S. A. Ali, S. K. Mondal, T. Das, S. K. Manna, A. Bera, D. Dafadar, S. Naskar, **M. R. Molla*** and S. Samanta. (**2019**): One-pot tandem cyclisation to pyrrolo[1,2-a][1,4]-benzodiazepines: a modified approach to the Pictet–Spengler reaction. *Org. & Biomol. Chem*. (DOI: 10.1039/c9ob00448c) (**I. F. 3.56**)

28. Mondal, S., Saha, M., Ghosh, M., Santra, M., Khan, M.A., Saha, K. D., **Molla, M. R.*** (**2019**): Programmed Supramolecular Nanoassemblies: Enhanced Serum Stability and Cell-Specific Triggered Release of Anti-Cancer Drugs. *Nanoscale Advance*, **1**, 1571. (**I.F. Pending**)

27. **Molla, M. R*.,** Böser, A., Rana, A., Schwarz, K., Levkin, P. A*. (**2018**): One-Pot Parallel Synthesis of Lipid Library via Thiolactone Ring Opening and Screening for Gene Delivery. *Bioconjugate Chem*. **29**, 992-999. (**I.F. 4.818)**

26. **Molla, M. R**., Rangadurai, P., Antony, L., Swaminathan, S., de Pablo, J.J., Thayumanavan, S. (**2018**): Dynamic actuation of glassy polymersomes through isomerization of a single azobenzene unit at the block copolymer interface. *Nat. Chem*.**10**, 659. (**I.F. 26.20**)

25. Rangadurai, P., **Molla, M. R**., Prasad, P., Caissy, M., Thayumanavan, S. (**2016**): Temporal and Triggered Evolution of Host–Guest Characteristics in Amphiphilic Polymer Assemblies. *J. Am. Chem.Soc*. **138**, 7508. **(I.F. 13.038)**

24. **Molla, M. R**., Levkin, P. (**2015**): Combinatorial Approach to Nanoarchitectonics for Nonviral Delivery of Nucleic Acids. *Advanced Material*. **28**, 1159. **(I.F. 18.96)**

23. Prasad, P., **Molla, M. R**., Cui, W.; Canakci, M.; Osborne, B. A.; Mager, J.; Thayumanavan, S. (**2015**): Polyamide Nanogels from GRAS Components and Their Toxicity in Mouse Pre-implantation Embryos. *Biomacromolecules*, **16**, 3491. (**I.F. 5.75**)

22. **Molla, M. R**., Prasad, P., Thayumanavan, S. (**2015**): Protein Induced Supramolecular Disassembly of Amphiphilic Polymer. *J. Am. Chem.Soc*. **137**, 7286. **(I.F. 13.038)**

21. **Molla, M. R.**, Rangadurai, P., Pavan, G. M., Thayumanavan, S. (**2015**): Experimental and Theoritical Investigations in Stimuli Responsive Dendrimer Based Assembly. *Nanoscale. 7*,

3817. **(I.F. 7.76)**

20. **Molla, M. R.**, Marcinko, T., Prasad, P., Deming, D., Garman, S. C., Thayumanavan, S. (**2014**): Unlocking a Caged Lysosomal Protein from a Polymeric Nanogel with a pH Trigger. *Biomacromolecules.* 15, 4046. **(I.F. 5.75)**

19. **Molla M. R.**, Ghosh, S. (2014): Aqueous Self-Assembly of Chromophore Conjugated Amphiphile. *Physical Chemistry Chemical Physics. 1***6**, 26672-26683 (Review Article). **(I.F. 4.449)**

18. Satapathi, S., **Molla M. R.**, Bhattacharyya, S., Ghosh, S, Patra, A. (2014): Photophysical study of P3HT/NDI based hybrid nanoparticles. *The European Physical Journal D.* **68**, 1-7. **(I.F. 1.228)**

17. Gangopadhayay, R., Das, B., **Molla,M.R**. (**2014**):How does PEDOT combine with PSS? Insight from structural studies. *RSC. Advance.* **4**, 43912-43920. **(I.F. 3.289)**

16. **Molla, M. R**., Gehrig, D., Roy, L., Kamm, V., Paul, A., Laquai, F., Ghosh, S. (**2014**): Self-Assembly Carboxylic Acid Appended Napthalene Diimide Derivatives with Tunable Luminescent Color and Electrical Conductivity. *Chemistry-A European Journal*. **20**, 760-771. **(I.F. 5.771)**

15. Rajdev, P., **Molla, M. R**., Ghosh, S. (**2014**): Understanding the role of H-bonding in Aqueous Self-Assembly of Two Naphthalene Diimide (NDI)-Conjugated Amphiphiles. *Langmuir* .**30**, 1969-1976. **(I.F. 3.993)**

14. Kar, H., **Molla, M. R.**, Ghosh, S. (**2013**): Two component gelation and morphology dependent conductivity of a Naphthalene diimide (NDI) π system by orthogonal hydrogen-bonding. *Chemical Communication*. **49**, 4220-4222. **(I.F. 6.567)**

13. **Molla, M. R**., Ghosh, S. (2012): Exploring versatile sulfhydryl-chemistry in the chain end of a synthetic polylactide. *Macromolecules*. **45**, 8561-8570. **(I.F. 5.554)**

12. **Molla, M. R**., Ghosh, S. (2012): H-Bonding-Mediated Vesicular Assembly of

Functionalized Naphthalene-Diimide Based Bolaamphiphile and Guest-Induced Gelation in Water. *Chemistry-A European Journal.* **32**, 9860-9869. **(I.F. 5.771)**

11. Das, A., **Molla, M. R**., Maity, B., Koley D., Ghosh, S. (**2012**): Hydrogen-bonding mediated alternate-stacking of donor (D) and acceptor (A) chromophores and their supramolecular- switching to segregated states. *Chemistry-A European Journal.* **18**, 9849-9859. (Appeared as inside cover page) **(I.F. 5.771)**

10. **Molla, M. R**. Ghosh, S. (**2012**): H-bonding mediated J-aggregation and white-light emission from remarkably simple single-component naphthalene-diimide chromophore. *Chemistry-A European Journal.* **18**, 1290-1294. (Appeared in the front cover page) **(I.F. 5.771)**

9. **Molla, M. R**., Das, A., Ghosh, S. (**2011**): Chiral induction by helical neighbor: Spectroscopic visualization of macroscopic-interaction among self-sorted donor and acceptor pi-stacks. *Chemical Communication* **47**, 8934-8936. **(I.F. 6.567)**

8. **Molla, M. R**.,Ghosh, S. (2011): Structural Variations on self-assembly and macroscopic properties of 1, 4, 5, 8-Naphthalene-diimide chromophores. *Chemistry of Materials.* **23**, 95-105. **(I.F. 9.407)**

7. Das, A., **Molla, M. R**., Banerjee, A., Paul, A., Ghosh, S. (**2011**): Hydrogen-bonding directed assembly and gelation of donor-acceptor chromophores: Supramolecular Reorganization from Charge-Transfer to Self-Sorted State. *Chemistry-A Euopean Journal.* **17,** 6061-6066. (Appeared as inside cover page) **(I.F. 6.567)**

6. Das, A., **Molla M. R**., Ghosh, S. (**2011**): Comparative self-assembly studies and self-sorting of two structurally isomeric naphthalene-diimide (NDI)-gelators. *Journal of Chemical Science.* **123**, 963–973. **(I.F. 1.298)**

5. Ghosh, S., Nayek, P., Roy, S. K., Gangopadhayay, R., **Molla M. R**., Majumder, T. P. (**2011**): Effect of conducting polymer poly (3, 4-ethylenedioxythiophene) (PEDOT) nanotubes on electro-optical and dielectric properties of a ferroelectric liquid crystal. *The European*

Physical Journal E. **34**, 35. **(I.F. 1.757)**

4. Ghosh, S., Nayek, P., Roy, S. K., Gangopadhayay, R., **Molla M. R**., Dabrowski, R. (**2011**): A Comparative Study of Poly (3,4-ethylenedioxythiophene) (PEDOT) Nanotubes Doped Nematic Liquid Crystal (NLC) System and Carbon Nanotubes (CNT) Doped NLC System for Greater Modification of Electro-Optical Properties of the Host NLC 1770-2. *Molecular Crystal Liquid Crystal.* **545**, 1246-1252.

3. Gangopadhayay, R., **Molla, M. R**. (**2011**): Polypyrrole - PVA Stable Nanodispersion : A Prospective Conducting Black Ink. *Journal of Polymer Science. Part B: Polymer. Physics.* **49,** 792- 800. **(I.F. 3.83)**

2. **Molla, M. R**., Das, A., Ghosh, S. (2010):Self-sorted assembly in the mixture of donor and acceptor chromophores. *Chemistry-A European. Journal*. **16**, 10084-10093. **(I.F. 6.567)**

1. Ghosh, S., Nayek, P., Roy, S. K., Gangopadhayay, R., **Molla M. R**., Dabrowski, R. (**2010**): Effect of conducting polymer poly (3, 4-ethylene dioxythiophene) nanotubes on the electro-optical and dielectric properties of a nematic liquid crystal 4-n-pentyl- 4'- cyanobiphenyl host. *Applied Physics Letter*. **96**, 073101. **(I.F. 6.567)**

B) Conference Presentation

13**. M. R. Molla,** Book of Abstract, International Conference on Recent Advances in Chemistry and Material Sciences, University of Calcutta, August, 2-3, 2020.

12**. M. R. Molla,** S. Mondal, M. Saha, M. Ghosh, S. Santra, M. A. Khan, Programmed Supramolecular Nanoassemblies: Enhanced Serum Stability and Cell-Specific Triggered Release of Anti-Cancer Drugs, Book of Abstract, Recent Advances in Chemistry, NIT Meghalaya, October 14-15, 2019.

11. **M. R. Molla**, P. Levkin, One-pot synthesis of combinatorial library of lipid like materials for gene delivery applications". Book of Abstract, ERC Grantees conference, Zandvoort,

Netherland, August31, 2016.

10. **M. R. Molla**, S. Ghosh, "Versatile Thiol-Chemistry in the Chain-Terminal of Polylactide" Book of Abstract, APA-2013, Punjab University, Chandigarh, February 21-23, 2013. (**This was selected for the best poster award**).

9. **M. R. Molla**, S. Ghosh, "Testing the scope of versatile thiol-chemistry in the chain-end of synthetic polylactides " Book of Abstract, Polytech-2012, Pune, December 15-17, 2012.

8. **M. R. Molla**, S. Ghosh, "J-Aggregation and White-Light Emission from a Remarkably-Simple Carboxylic Acid-Appended Naphthalene- Diimide Derivative" Book of Abstract, Young Scientist Colloquium-2012 (MRSI, Kolkata Chapter), CGCRI, Jadavpur, August 8, 2012.

7. **M. R. Molla** and S. Ghosh, "self-sorting vs mixing" Book of Abstract, National seminar on some modern aspects in chemical research, Bidhannagar College, Salt Lake, February 7-8, 2012.

6. **M. R. Molla** and S. Ghosh, "Hydrogen bonding mediated supramolecular -assembly of donor and acceptor chromophores: self-sorting vs mixing" Book of Abstracts, Young Scientist Colloquium-2011(MRSI, Kolkata Chapter), IACS, Jadavpur, August 4, 2011.

5. **M. R. Molla**, S. Ghosh, "Self-assembly and Gelation of Naphthalene Bisimide (NDI) π System"-Book of Abstract, National Symposium in Organic Chemistry (NSOC-IV), Jadavpur University, Kolkata, February 2-5, 2011.

4. **M. R. Molla**, S. Ghosh, "Self-Assembly and Gelation of Naphthalene Bisimide (NDI) π System"-Book of Abstract, International Symposium on Facets of Weak Interactions in Chemistry (ISFWIC), University of Calcutta, Kolkata, January 13-15, 2011.

3. **M. R. Molla**, S. Ghosh, " Structure-Property Relationship Study of Naphthalene Bisimide (NDI) Containing Supramolecular Polymers"-Book of Abstract, 11th International Symposium

on Frontiers of Polymers and Advanced Materials (MACRO 2010), IIT Delhi, Delhi, December 15-17, 2010.

2. **M. R. Molla**, S. Ghosh, "Structure-Property Relationship Study of Naphthalene Bisimide (NDI) Containing Supramolecular Polymers"- Book of Abstracts, International Symposium on Advances in Nanomaterials (ANM 2010), CGCRI, Kolkata, December 6-7, 2010.

1. **M. R. Molla**, A. Das, S. Ghosh, "Orthogonal Self-Assembly in Aromatic Donor and Acceptor Mixture" - Book of Abstracts, 12th CRSI National Symposium in Chemistry, IICT, Hyderabad, February 2-5, 2010 (**This was selected for the best poster award)**

C) Books/book chapters: *none*

12. Membership of Learned Societies:

a) The Society for Polymer Science, India (Kolkata Chapter)
b) Life member of Indian Chemical Society
c) Associate of the West Bengal Academy of Science & Technology (WAST)

13. Patents:

c) Benz. M., Molla, **M. R.,** Levkin, P. A.: Procedure of treating at least one cell with a chemical synthesis product in a microarray. Submitted as German patent. (Application No DE/10.04.2018/DEA 102018002880 and Application Date: 20.03.2019)

b) **Molla, M. R**., Boser, Alexander, Levkin, Pavel: Organic Molecules for use as a Transfection Agents. Submitted as German Patent. (Application No 102018104783.5 and Application Date: 02.03.2018)

a) Thayumanavan, S., **Molla, M. R**.: Polymers and polymeric nanogels with hydrophilics encapsulation and release capabilities and methods thereof. Submitted as U. S. Patent. (Application No 62/051,887 and Application Date: 17.09.2014)

14. Invited lectures delivered:

(a) "Self-sorting vs. mixing" Book of Abstract, National seminar on some modern aspects in chemical research, Bidhannagar College, Salt Lake, February 7-8, 2012.

(b) Polymer Materials in Medicinal Chemistry, One day State Level Seminar on Polymer Science & Medicinal Chemistry, April, 5th, 2022.

(c) Polymeric Cross-linked Nanoassemblies for Drug Delivery Applications, One Day Symposium in Chemical Science, CRSI Kolkata Chapter, IACS, Kolkata, June, 2022.

(d) Stimuli Responsive Nanoassemblies for Drug Delivery Applications, Book of abstract, National Conference on Smart Polymer Materials, MAKAUT, Kalyani, November 18-19, 2022.

15. Awards:

- Teachers Associateship for Research Excellence Award (**TARE-2022-2025**)
- Young Scientist Award, Indian Chemical Society, Kolkata (**2020**)
- Early Carrier Research Award, DST (**ECRA-2019-2022**)
- Alexander von Humboldt Visiting Scientist, Germany (**2018-2019**)
- Alexander von Humboldt Postdoctoral Award, Germany (**2016**)
- Sir P C Ray Research Award, University of Calcutta, India (**2014**)
- Best Poster Award, International Conference on the Frontires of Science &Technology, Punjab University, India (**2013**)
- Best Poster Award, 12th CRSI National Symposium in Chemistry, IICT Hyderabad, India (**2010**)
- Qualified Joint CSIR-UGC National Eligibility Test (**2008**)
- Excellent Student Award from Mass Education (**2001)**

16. Editor/Editorial Board Member: NA

17. One day Seminar Organized as a Convener:

a) Emerging Trends in Chemical Science (ETCS-2017), Organizer: CAS, University of Calcutta

b) Recent Advances in Chemistry and Material Sciences (RACMS-2020), Organizer: Indian Chemical Society