

Molla R. Islam, Ph. D.

Schmid College of Sci. and Tech., Keck Center for Sci. and Eng., Chapman University, Orange, CA 92866

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Research Profile: <https://scholar.google.com/citations?user=mxrv6eAAAAAJ&hl=en>

Teaching Profile: <http://www.ratemyprofessors.com/ShowRatings.jsp?tid=2106585>

Professional Experience

Manager High-Resolution Imaging Facility, Schmid College of Sci. and Tech.	06/2019-present
Adjunct Faculty Department of Chemistry, Chapman University, Orange, CA	08/2015-present
Research Scientist Research Collaborator: L. Andrew Lyon Dean, Fowler School of Engineering, Chapman University Research Theme: The application of soft materials for biological applications	04/2015-06/2021
Post-Doctoral Fellow Advisor: Michael J. Serpe, Department of Chemistry, University of Alberta Research Theme: DNA and protein sensing by responsive microgel based sensors	2012-2015
Lecturer Department of Chemistry, Shahjalal University of Science and Technology, Bangladesh	2000-2005

Education

Ph D Department of Chemistry, Carleton University, Ottawa, ON, Canada Advisor: Professor P. R. Sundararajan Research Focus: Self-assembly, morphology, block copolymer,	2006-2011
M Sc in Inorganic Chemistry and B Sc (Hons) in Chemistry Department of Chemistry, Shahjalal University of Science and Technology, Bangladesh	1994-1999

Teaching Experience

Chapman University

1. CHEM 103 Chemistry of Health Lecture	Fall, 2018, Spring 2019, Spring 2020
2. CHEM 331L Organic Chemistry II Lab	Spring 2019, Spring 2020, Spring 2021
3. CHEM 301 Inorganic Chemistry Lecture	Spring 2016, Spring 2018
4. CHEM 302L Inorganic Chemistry Lab	Spring 2016, Spring 2018
5. CHEM 150L General Chemistry II Lab	Spring 2017
6. CHEM 230L Organic Chemistry Lab	Fall 2017, Fall 2019, Fall 2018
7. CHEM 140L General Chemistry Lab	Fall 2015, Fall 2016

Carleton University

1. CHEM 4407 Polymer Modeling (0.5 Credit)	Spring 2009
2. CHEM 4407 Polymer Modeling (0.5 Credit)	Spring 2010
3. CHEM 1000 General Chemistry Lab	Spring 2007-2011, Fall 2007-2011

Professional Development/ Training on Teaching

- 6 **IETL 2018 Summer Academy on Teaching**, August 14-15, Chapman University, Orange, CA 2019
- 5 **January Conference on Teaching (JanCon)** January 26, Chapman University, Orange, CA 2018
- 4 **IETL 2017 Summer Academy on Teaching**, August 15-16, Chapman University, Orange, CA 2017
- 3 **IETL 2016 Summer Academy on Teaching**, August 16-17, Chapman University, Orange, CA 2016
- 2 Teaching and Learning Symposium under the title "**Think Outside the Lecture: Strategies for Active Learning Symposium**" by University of Alberta, Edmonton, AB, Canada, August 13. 2014
- 1 W.E. Harris Teaching Workshop on "**Enhancing the Undergraduate Experience: To the Curriculum and Beyond!**" by University of Alberta, Edmonton, Alberta, Canada, May 15-16. 2014

Research Co-supervisor

Chapman University Students (Honors Capstone Research Project)

- 8 Dela Hatfield, BS in Biochemistry and Molecular Biology
Synthesis and Characterization of Core-Shell-Shell Microgels 2021
- 7 Sanika Pandit, BS in Biological Sciences and Computer Science
Designed Hydrogel Microspheres for Management of Thrombosis 2021
- 6 Rachel Lustig, BS in Biological Sciences and Computer Science
Ultra-Low Crosslinked Microgel and Gold Nanoparticle Composites 2020
- 5 Chelsey Nguy, Post Baccalaureate in Biochemistry
Design and Synthesis of Core-Shell Poly (N-isopropylacrylamide) Microgel 2019
- 4 Anne Roffler, BS in Biochemistry and Molecular Biology
Poly (N-isopropylacrylamide)-based Anti-PEG Antibodies for Sensing 2018
- 3 Rachel Nguyen, BS in Biochemistry and Molecular Biology
Photonic Crystal Assembly of Crosslinker Free Microgels 2018
- 2 Sonia Djafri, BS in Biochemistry and Molecular Biology
Deswelling Studies of Crosslinker Free Microgels in AuNP solution 2017
- 1 Joseph Dodgson, BS in Biochemistry and Molecular Biology
Self-assembly and Dewetting Pattern of PEG-based Highly Crosslinked Microgels 2016

Community College Students Under Summer Undergraduate Research Fund (SURF)

- 4 Usiomo Ujadughele, Cypress College
DLS Studies of Ultra Low Crosslinked Microgel with Gold Nanoparticles 2017
- 3 Richard Niederecker (Summer 2016), Saddleback College
The Properties of Self-Healing Films in a Stretch State 2016
- 2 Chad Province (Summer 2016), Saddleback College
Colloidal Self-Assembly of Poly(N-isopropylacrylamide)-Based Microgel. 2016
- 1 Michael Carlson (Summer 2015), Saddleback College
The Accelerated Degradation of Poly(Ethylene Glycol)-Based Microgels 2015

High School Students (Community Engagement Initiative)

4	Anirudh Sharma, Senior of Trabuco Hills High School, Mission Viejo, CA	Summer 2018
	Dewetting Patterns of Microgel by Atomic Force Microscope	
3	Amanda Gao, Junior of Oxford High School, Cypress, CA	Summer 2018
	Colloidal Crystal Assembly of Ultra Soft Microgels	
2	Maddie Tumbarello, Junior of Corona del mar High School, Corona, CA	2017-2018
	Deswelling Studies of pH and temperature Responsive Microgels	
1	Vivian Yup, Junior of Troy High School, Fullerton, CA	2017
	Incorporation of AuNP in Ultra Low Crosslinked Microgels	

Journal Reviewer

8	Chemical Science
7	Soft Matter
6	Colloids and Surfaces A
5	Macromolecules
4	ACS Nano
3	Journal of Colloid and Polymer Science
2	Journal of Colloid and Interface Science
1	Journal of Applied Polymer Science

Research Publications (* undergraduate student/high school student)

- 31 **Islam, M. R.;** Nguyen, R;* Lyon, L. Emergence of Non-Hexagonal Crystal Packing of Deswollen and Mechanically Deformed Ultra-Soft Microgels Under Osmotic Pressure. *Submitted to Macromol. Rapid Commun.* (Submission date 06/05/2021, submission is marc.202100372, in revision now).
- 30 **Islam, M. R.;** Nguy, C;* Pundit, S;* Lyon, L. Design and Synthesis of Ultra-Low Crosslinked Core-shell Microgels with One-Step Clickable Core, *Macromol. Chem. Phys.*, **2020**, 2000156 (1-16).
- 29 **Islam, M. R.;** Lyon, L. Deswelling Studies of pH and Temperature-Sensitive Ultra-Low Crosslinked Microgels with Crosslinked Cores, *Colloid. Polym. Sci.*, **2020**, 298, 395–405.
- 28 **Islam, M. R.;** Tumbarello, M;* Lyon, L. Deswelling Induced Morphological Changes in Dual pH and Temperature Responsive Ultra-Low Crosslinked Poly (N-Isopropyl Acrylamide)-Co-Acrylic Acid Microgels, *Colloid Polym. Sci.*, **2019**. 297: 667-676.
- 27 **Islam, M. R.;** Azmi, S;* Teimoory, F.; Loppnow, G.; Serpe, M. J. Isolation of RNA from a Mixture and its Detection by Utilizing a Microgel-Based Optical Device, *Can. J. Chem.*, **2018**. doi.org/10.1139/cjc-2018-0199
- 26 **Islam, M. R.;** Xie, S; * Huang, D.; * Smyth, K.; * Serpe, M. J. "Poly (N-Isopropylacrylamide) Microgel-based Optical Devices for Humidity Sensing." *Analytica Chimica Acta*, **2015**, 898: 101-108.
- 25 **Islam, M. R.;** Irvine, J.;* Serpe, M. J. "Photothermally Induced Optical Property Changes of Poly (N-isopropylacrylamide) Microgel-Based Etalons." *ACS Appl. Mater. Interface*, **2015**, 7(43): 24370-24376.
- 24 **Islam, M. R.;** Ahiabo, A.; Li, X.; Serpe, M. J., Poly (N-isopropylacrylamide) Microgel-Based Optical Devices for Sensing and Biosensing, *Sensors*, **2014**, 14(5), 8984-8995, (*invited review*).

23 **Islam, M. R.;** Gao, Y.; Li, X.; Serpe, M. J. Responsive Polymers for Biosensing and Protein Delivery. *J. Mater. Chem. B* **2014**, *2*, 2444-2451. (invited review)

Invited Review for 2014 Emerging Investigators Themed Issue)

One of the most downloaded articles in March/April 2014.

22 **Islam, M. R.;** Gao, Y.; Li, X.; Zhang, Q. M.; Wei, M.; Serpe, M. J., Stimuli Responsive Polymeric Materials for Applications in Human Health, *Chinese Science Bulletin*, **2014**, *59* (32), 4237-4255. (Invited review)

21 Zhang, Q. M.; Li, X.; **Islam, M. R.;** Wei, M.; Serpe, M. J., Light Switchable Optical Materials from Azobenzene Crosslinked Poly (N-Isopropylacrylamide)-Based Microgels, *J. Mater. Chem. C*, **2014**, *2*, 6961-6965.

20 **Islam, M. R.;** Serpe, M. J., A Novel Label-Free Colorimetric Assay for DNA Concentration in Solution. *Anal. Chim. Acta*, **2014**, *843*, 83–88.

19 **Islam, M. R.;** Serpe, M. J., Poly (N-isopropylacrylamide) Microgel-Based Thin Film Actuators for Humidity Sensing, *RSC Advances*, **2014**, *4*, 31937-31940.

18 **Islam, M. R.;** Serpe, M. J. Polymer-Based Devices for the Label-Free Detection of DNA in Solution: Low DNA Concentrations Yield Large Signals. *Anal. Bioanal. Chem.* **2014**, *406* (19), 4777–4783.

17 **Islam, M. R.;** Sundararajan, P. R. Self-Assembly of a Set of Hydrophilic-Solvophobic-Hydrophobic Coil-Rod- Coil Molecules Based on Perylene Diimide. *Phys. Chem. Chem. Phys.* **2013**, *15*, 21058-21069.

16 **Islam, M. R.;** Serpe, M. J. Poly (N-isopropylacrylamide) Microgel-based Etalons and Etalon Arrays for Determining the Molecular Weight of Polymers in Solution. *APL Mater.* **2013**, *1*, 052108/052101-052108/052107.

15 Heppner, I. N.; **Islam, M. R.;** Serpe, M. J. Unexpected Cononsolvency Behavior of Poly (N-isopropylacrylamide) Based Microgels. *Macromol. Rapid Commun.* **2013**, *34*, 1708-1713.

14 **Islam, M. R.;** Johnson, K. C. ;* Serpe, M. J. Microgel-based Etalon Coated Quartz Crystal Microbalances for Detecting Solution pH: The Effect of Au Overlayer Thickness. *Anal. Chim. Acta* **2013**, *792*, 110-114.

13 **Islam, M. R.;** Li, X.; Smyth, K. ;* Serpe, M. J. Polymer-Based Muscle Expansion and Contraction. *Angew. Chem., Int. Ed.* **2013**, *52*, 10330-10333.

Work featured on front cover

12 **Islam, M. R.;** Serpe, M. J. Label-free Detection of Low Protein Concentration in Solution Using a Novel Colorimetric Assay. *Biosens. Bioelectron.* **2013**, *49*, 133-138.

Featured in ACCN- The Canadian Chemical News: Sep/Oct 2013

11 **Islam, M. R.;** Serpe, M. J. Polyelectrolyte Mediated Intra and Intermolecular Crosslinking in Microgel-Based Etalons for Sensing Protein Concentration in Solution. *Chem. Commun.* **2013**, *49*, 2646-2648.

10 **Islam, M. R.;** Serpe, M. J. Penetration of Polyelectrolytes Into Charged Poly(N-isopropylacrylamide) Microgel Layers Confined Between Two Surfaces. *Macromolecules* **2013**, *46*, 1599-1606.

- 9 **Islam, M. R.;** Sundararajan, P. R. NanoScale Self-Assembly Impeded by CH $\cdots\pi$ Interaction in Block Selective Solvents in the Case of Oligostyrene-Perylenediimide-Oligostyrene (Coil-Rod-Coil) Molecule. *Eur. Polym. J.* **2013**, *49*, 2042-2051.
- 8 Hu, L.; Sarker, A. K.; * **Islam, M. R.;** Li, X.; Lu, Z.; Serpe, M. J. Poly (N-isopropylacrylamide) Microgel-Based Assemblies. *J. Polym. Sci., Part A: Polym. Chem.* **2013**, *51*, 3004-3020 (*Research Highlights*).
- 7 **Islam, M. R.;** Lu, Z.; Li, X.; Sarker,* A. K.; Hu, L.; Choi, P.;* Li, X.; Hakobyan,* N.; Serpe, M. J. Responsive Polymers for Analytical Applications: A review. *Anal. Chim. Acta* **2013**, *789*, 17-32. (*invited review*)
- 6 **Islam, M. R.;** Dahan, E.; Saimani, S.; Sundararajan, P. R. Preclusion of Nano Scale Self-Assembly in Block-Selective Non-Aqueous Solvents for Rod-Coil and Coil-Rod-Coil Macromolecular Surfactants Based on Perylene Tetracarboxylic Diimide. *Eur. Polym. J.* **2012**, *48*, 1538-1554.
- 5 **Islam, M. R.;** Sundararajan, P. R. Tubular or Subsurface Morphology of Octabutoxyphthalocyanine upon Self-Assembly in Polymer Matrices: Effect of the Casting Solvent. *Chem. - Eur. J.* **2011**, *17*, 6098-6108.
- 4 Sundararajan, P.R.; **Islam, M. R.**, "Poly (vinyl alcohol)" (an encyclopedic article) in *Polymer Data Handbook*, J. E. Mark Ed., Oxford University Press, 2nd edition, **2009**, 1116-1129. (Book Chapter)
- 3 **Islam, M. R.;** Sundararajan, P. R. Morphology of a Hydrogen-Bond Mediated Self-Assembling Small Molecule in a Polycarbonate Matrix. *Can. J. Chem.* **2008**, *86*, 600-607.
- 2 Alam, J. B.; **Islam, M.R.**, Muyen, Z.; Mamun, M.; Islam, S. Water Quality Parameters Along Rivers. *Int. J. Environ. Sci. Technol.* **2007**, *4*, 159.
- 1 Alam, J.B.; Hossain, A.; Khan, S.K.; B. K. Banik; **Islam, M. R.;** Muyen, Z.; Rahman, M.H. Deterioration of Water Quality of Surma River, *Environ Monit Assess*, **2007**, *134*, 233-242.

Awards /Scholarships /Honors

2014	Gordon Research Conference Travel Grant	\$ 600
2011	Graduate Scholarship, Academic	\$ 2000
2011	Dean of Graduate Studies Academic Excellence Scholarship, Academic	\$ 6000
2010	<i>Graduate Teaching Assistant Excellence Award</i> , Communication	
2010	Graduate Scholarship, Academic	\$ 2000
2010	Dean of Graduate Studies Academic Excellence Scholarship, Academic	\$ 6000
2009	Graduate Scholarship, Academic	\$ 2000
2009	Best Presentation Award by Ottawa-Carleton Chem. Institute, Communication	
2009	Dean of Graduate Studies Academic Excellence Scholarship, Academic	\$ 6000
2009	<i>Emmet Dunne Scholarship</i> , Research	\$ 5000
2008	Graduate Scholarship, Academic	\$ 2000
2008	Dean of Graduate Studies Academic Excellence Scholarship, Academic	\$ 6000
2007	Dean of Graduate Studies Academic Excellence Scholarship, Academic	\$ 6000
2007	<i>Molecular Recognition and Inclusion Scholarship</i> , Research	\$ 1500
2006	Graduate Scholarship, Academic, Academic	\$ 2000

2006	Dean of Graduate Studies Academic Excellence Scholarship, Academic	\$ 6000
1998	Chancellor's Book Medal for First Class First Rank in M.Sc. (Inorganic)	
1998	Chancellor's Book Medal for First Class First Rank in B.Sc. (Hons.)	
1993	<i>Gold Medal for Secondary School Certificate Examination</i>	

Scientific Presentations and Conferences (*presenting author)

17	Islam, M. R.; * Nguy, C;* Pundit, S; Lyon, A., Core-Shell Microgels with Clickable Crosslinked Cores and Ultra-low Crosslinked Shells, Virtual Symposium on Microgels, October 14 (Oral)	2020
16	Lyon, A.;* Islam, M. R.; R Nguyen, Packing and Defect Tolerance of Ultra-low Cross-Linked Microgel Assemblies, 255th ACS National Meeting & Exposition, New Orleans, LA, March 18-22. (Oral)	2018
15	Islam, M. R.; * Lyon, A., pH and Temperature Dependent Swelling Studies of Core-Shell Microgels Prepared with Ultralow Crosslinked Microgels, 255th ACS National Meeting & Exposition, New Orleans, LA, March 18-22. (Oral)	2018
14	Islam, M. R.; * Welsch, N.; Lyon, A., Tuning the Properties of Oligo Ethylene Glycol and Poly (<i>N</i> - isopropylacrylamide) Microgel for Future Biomedical Applications, 251st ACS National Meeting & Exposition, San Diego, California, March 13-17. (Oral)	2016
13	Islam, M. R.; Li, Xue; Gao, Y.; Serpe, M.J.*, The Colorful World of Poly (<i>N</i> -isopropylacrylamide) Microgel- Based Etalons, 2014 IUPAC World Polymer Congress (MACRO 2014), July 6-11, Chiangmai, Thailand. (Oral)	2014
12	Islam, M. R.; * Serpe, M.J., Stimuli Responsive Microgels for Sensing and Biosensing Applications, Polymer Seminar Series 2014-2015, June 25, University of Alberta, Alberta, Edmonton. (Oral)	2014
11	Islam, M. R.; * Serpe, M.J., Poly (<i>N</i> -isopropylacrylamide) Microgel Assemblies for Biosensing, IC-IMPACTS, March 12, UBC, Vancouver. (Oral)	2014
10	Islam, M. R.; * Serpe, M.J. (2014), Poly (<i>N</i> -isopropylacrylamide) Microgel Assemblies and Their Applications, Nano Symposium, February 7, University of Alberta.(Oral)	2014
9	Islam, M. R.; * Serpe, M.J. (2014), Poly (<i>N</i> -isopropylacrylamide) Microgel-Based Etalons for Sensing Applications, Colloidal, Macromolecular & Polyelectrolyte Solutions Gordon Research Conference, February 15-21, Ventura, CA, USA. (Oral) Awarded Travel Grant.	2014
8	Islam, M. R.; * Serpe, M.J., Poly (<i>N</i> -isopropylacrylamide) Microgel Assemblies and Their Applications, Biorefining Conversions Network, November 5-7, Banff, AB, Canada.	2013
7	Islam, M. R.; * Serpe, M.J., Investigation and Exploitation of Polyelectrolyte Induced Crosslinking in Poly (<i>N</i> - isopropylacrylamide) Microgel-Based Etalons, 96 th Canadian Chemical Conference and Exhibition, May 26-30, Quebec, Canada. (Oral)	2013
6	Islam, M. R.; * π -Mediated Self-assembly of Polymer-tethered and Polymer-dispersed Large Aromatic Chromophores, Department of Polymer Science and Engineering, University of Massachusetts, Amherst, USA, October 4. (Invited Speaker)	2011
5	Islam, M. R.; * Sundararajan, P. R., Self-assembly of Rod-Coil and Coil-Rod-Coil Amphiphilic Polymers Based on Perylene Tetracarboxylic Diimide in Water and in Bulk, 92 nd Canadian Chemical Conference and Exhibition, May 30-June 3, Hamilton, Canada. (Oral)	2009
4	Islam, M. R.; * Sundararajan, P. R., Controlled Self-Assembly of Perylene Diimide by Modulating Hydrophilic and Hydrophobic Interactions, Ottawa-Carleton Chemistry Institute Day, May 4, Ottawa, Canada (Oral). Judged for the best oral presentation award.	2009
3	Islam, M. R.; * Sundararajan, P. R., Self-Assembly of Amphiphilic Perylene Diimide in Aqueous Media, 2 nd Nanotech Conference, Carleton University. (Oral)	2009

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| 2 | Islam, M. R.; * Sundararajan, P. R., π - Interaction Mediated Self-assembly of Small Molecules in a Polymer Matrix: The Effect of Solvent on the Morphology, Ottawa Carleton Chemistry Institute Day, May 11. (Poster) | 2007 |
| 1 | Islam, M. R.; * Sundararajan, P. R., π -Interaction Mediated Self-assembly of Small Molecules in a Polymer Matrix: The Effect of Solvent on the Morphology, poster presented in the 90 th Canadian Chemical Conference and Exhibition, Winnipeg, Manitoba, May 26-31. (Poster) | 2007 |

Leadership/Volunteer Experience

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| 3 | Workshop presenter, Discovery Day in Health Sciences at the University of Alberta, October 17. Title: Polymer-Based Devices: Artificial Muscles to Disease Diagnostics. I Trained 10 high school (grade12) students and two high school teachers | 2013 |
| 2 | Organized a workshop titled “ Disease Diagnostic and Instrument Development Workshop ” on August 28-29, Lister Hall, University of Alberta. This brought 45 scientists /researchers working on point-of-care diagnostics or bio-sensing in Canada. | 2012 |
| 1 | Supervisor for summer research program (May-August) of a high school student under Women in Scholarship, Engineering, Science & Technology (WISEST) scholarship. The student worked on the project titled “ A novel Humidity Sensor of Responsive Polymer ”. University of Alberta, Edmonton, AB. | 2012 |

Membership in Professional Societies

American Chemical Society

Citizenship

Canada and Bangladesh

Permanent Resident

USA