Curriculum Vitae
Arif Md. Rashedul Kabir

❖ Current position and affiliation

Assistant Professor
Material Chemistry Laboratory
Department of Chemistry
Faculty of Science
Hokkaido University, Japan

❖ Ongoing research projects

1. 'Development of molecular actuation systems for minimal artificial brain' funded by Japan Society for the Promotion of Science (JSPS)

Goal of the project: A minimal artificial brain, comprised of three types of neuroid (artificial cells), will be developed for biomedical and nanotechnological applications. I am assigned to develop an actuator neuroid that will facilitate connection with other two types of neuroid, i.e. sensor and processor neuroid through a large deformation of the entire neuroid unit in response to an external signal via a DNA origami-based transducer.

2. 'Emergence of autonomous functions through hierarchical integration of molecular engines' funded by JSPS

Goal of the project: I am responsible for hierarchically integrating molecular engines to be developed from biomolecular motors and DNA. Programmability of DNA will be controlled using an external optical signal which in turn will regulate the activities of the molecular engines. After successful fabrication, the molecular engines are expected to find applications in molecular robotics.

3. 'Fabrication of artificial muscles from biomolecular motors and DNA origami nanostructures' funded by JSPS

Goal of the project: I will fabricate bio-inspired artificial muscles by utilizing the power of biomolecular motor proteins and programmability of DNA and DNA-origami based nanostructures. The artificial muscles will be potential candidates as components of molecular machines for potential applications in molecular robotics, biomedical and health care industries.

4. 'Study on the role of the osmolytes derived from deep-sea organisms in improving the thermal stability of biomolecular motors' funded by Hirose Foundation

Goal of the project: Osmolytes in living organisms are known for their protective roles in maintaining proteins' functionality under environmental stress. In this project I aim at improving thermal stability of biomolecular motor proteins by utilizing the osmolytes found in deep-sea animals. The project is expected to widen the applications of biomolecular motors in artificial environments by stabilizing the proteins against harsh conditions, such as, temperature extremes. The outcomes will have significant impact in advancing applications of motor proteins in biotechnology and nanotechnology.

❖ Accomplishments (selected)

1. 'Investigating the role of mechanical stress in the disfunction of neuronal proteins leading to neurological diseases'

- Established a methodology and setup to demonstrate biomolecular motor-driven transportation in engineered environments.
- Developed a mechanical device to apply mechanical stress to neuronal proteins and explore its impact on the structure and functions of the proteins aided by microscopy-based monitoring.
- Unveiled the mechanism of mechanical stress-induced disruption of motor protein-driven transportation that leads to neurological diseases.

2. 'Future Artificial Intelligence and Robot Technology Research and Development Project' funded by New Energy and Industrial Technology Development Organization (NEDO), Japan

- Demonstrated fusion of protein biology and DNA nanotechnology to develop molecular machines or molecular devices for application in nanotechnology and biomedical engineering.
- Fabricated bio-inspired artificial sarcomere units from biomolecular motors and DNA origami nanostructures.
- Constructed a ~cm scale dynamic molecular-contraction system, functions of which is regulated by utilizing programmability of DNA.

3. 'Study on regulation of mechanical properties of microtubules by microtubule-associated proteins' funded by JSPS and Hirose Foundation

- Developed a methodology to investigate the mechanical property of neuronal and cytoskeletal proteins in a pseudo-cellular environment.
- Discovered the mechanism of deformation of cytoskeletal proteins under various forms of mechanical stress.
- Unveiled the role of associated proteins in regulating the mechanical property of the major protein filament in cytoskeleton and neuron
- For the first time, discovered the effect of associated proteins and mechanical forces on the failure of cytoskeletal protein filaments.

4. 'Research and Development of Amoeba-type Molecular Robots' funded by Japan Society for the Promotion of Science (JSPS)

- Fabricated molecular robots through fusion of biomolecular motors and DNA nanotechnology.
- Demonstrated swarming of molecular robots and regulated the swarming using chemical and optical signal.
- Demonstrated molecular computation using the swarm robots as a molecular computer.

5. 'Development of artificial cilia through self-organization of biomolecular motors'

- Designed a bottom-up approach of self-assembly of biomolecular motors by combining with methods based on bio-conjugate chemistry.
- Fabricated artificial cilia through the bottom-up self-assembly of motor proteins.

- Realized beating motion of the artificial cilia akin to that observed for bacteria.

6. 'Developing a sensor for detecting surface mechanical deformation of soft-materials'

- Constructed a mechanical device to realize deformation of soft materials at micro scale.
- Utilized biomolecular motors as probes/sensor for detecting the deformation of the surface of soft materials.
- Demonstrated validity of this novel approach for characterizing surface mechanical deformation of various soft materials.

7. 'Studying the effect of novel anticancer drugs and bio-inspired synthetic peptides on the stability and functionalities of cytoskeletal proteins'

- Designed and synthesized several anticancer drugs for biomedical applications.
- Studied the effect of the anticancer drugs on the stability of major cytoskeletal proteins.
- Explored the potentials of the drugs for biomedical applications and therapeutics.

8. 'Self-assembly of biological active matters and neuronal proteins'

- Developed biotechnological and engineering approach-based methodologies for performing active self-assembly of biological active matters.
- Controlled the morphology and features of active matters by regulating their self-assembly.
- Fabricated highly organized, complex mesoscale structures from biological materials.

9. 'Study on the lifetime of motor proteins in artificial environments'

- Investigated active lifetime of reconstructed motor proteins in artificial environments.
- Developed a novel methodology that is found effective in prolonging the lifetime of motor proteins 50 times compared to the conventional methods.

10. 'Investigating the kinetics of chemical reactions under the influence of surfactants'

- Designed a methodology for monitoring kinetics of chemical reaction.
- Unraveled the role of surfactants in modulating the kinetics of a model chemical reaction.

❖ Teaching records

1. Year: 2014

Courses: (i) Mechanics of Materials
(ii) Topology in Biology
(iii) Nanomaterial Chemistry
Level: Postgraduate
Institution: Hokkaido University

2. Year: 2015

Courses: (i) Mechanics of Materials
(ii) Topology in Biology
(iii) Nanomaterial Chemistry

Level: Postgraduate
Institution: Hokkaido University

3. Year: 2016
Courses: (i) Topology in Biology
(ii) Nanomaterial Chemistry
Level: Postgraduate
Institution: Hokkaido University

4. Year: 2017-2021
Course: (i) Nanomaterial Chemistry
Level: Postgraduate
Institution: Hokkaido University

❖ Education

September 2012: Doctor of Philosophy (Ph.D.), Biological Sciences
Hokkaido University, Japan
Enrolment: October 2009
Title of thesis: Study on *in vitro* lifetime of a biomolecular motor and its extension in an inert chamber system.

June 2008: Master of Science (M.S.), Chemistry
University of Dhaka, Bangladesh
Title of thesis: Kinetics of the alkaline hydrolysis of crystal violet influenced by micellization behavior of anionic surfactants.

June 2006: Bachelor of Science (B.Sc. Hons.), Chemistry
University of Dhaka, Bangladesh
Title of thesis: Kinetic investigation on alkaline hydrolysis of crystal violet in presence of an anionic surfactant sodium dodecyl benzene sulfonate (SDBS).

❖ Research career

1. October 2016-present: As an Assistant Professor (specially appointed)
Material Chemistry Laboratory,
Department of Chemistry, Hokkaido University.

2. January 2013-September 2016: As a Postdoctoral Fellow
Material Chemistry Laboratory,
Department of Chemistry, Hokkaido University.

3. October 2009- September 2012: As a Doctoral course student

Laboratory of Soft and Wet Matter,

Division of Biological Sciences,

Hokkaido University.

4. July 2006- June 2008: As a Master course student

Material Chemistry Research Laboratory

Department of Chemistry, University of Dhaka.

5. July 2004- June 2006: As a Bachelor course student

Material Chemistry Research Laboratory

Department of Chemistry, University of Dhaka.

❖ Professional career

October 2016-now: Assistant Professor (specially appointed)

Material Chemistry Laboratory, Department of Chemistry

Faculty of Science, Hokkaido University.

January 2013-September 2016: Postdoctoral Fellow

Material Chemistry Laboratory,

Department of Chemistry,

Faculty of Science, Hokkaido University.

❖ Award records

1) Award for encouragement of research in polymer science, The Society of Polymer Science, Japan, 2016.

Outline of the award: The Society of Polymer Science, Japan gives this award to encourage emerging young leaders who are engaged in pioneering research activities in polymer science and related fields. It is established for the purpose of patronizing active research and developing human resources who will contribute to the development of polymer science in future.

Title of the award-winning work: Development of a methodology for studying the mechano-responsiveness of microtubules and its applications

Summary: I received this award because of my groundbreaking research works in which I discovered the mechano-responsiveness of the cytoskeletal and neuronal protein 'microtubule' and the underlying mechanism of deformation under tensile and compressive stress (*Biomacromolecules*, 2014, 15, 1797-1805; *Scientific Reports*, 2015, 5, 1-12.). In these works, by using a custom-made mechanical device, I unveiled how tensile and compressive stress can

cause fragmentation and buckling of microtubules respectively. Such novel outcomes are of great biomedical interest (*ACS Applied Bio Materials*, 2020, 3, 1875-1883.). I further demonstrated how microtubules can be used as a probe to characterize mechanical deformation of soft materials.

2-4): Awards from BIOMOD competition

Outline of the award: I was the mentor of the Hokkaido University Team for BIOMOD competition in 2013, 2014, and 2015. BIOMOD is an international annual biomolecular design competition for undergraduate students. Teams from all over the world compete to build the coolest stuff using the molecules of life. Students present projects each year under guidance of their mentors and then travel to the Jamboree to present their work and win awards.

2) Gold medal in BIOMOD 2015, Harvard University, USA, November 2015.

Title of the project: Controlling group behavior of a self-propelled active matter

Summary: In this project, my team's goal was to simulate human behavior in a crowded condition. By using a self-propelled biomolecular motor system, we wanted to simulate how people may behave in a crowded environment. We demonstrated experiments in a micro-scale environment and reproduced human crowded condition by using gliding assay of motor-proteins and microtubules. Nanofabrication technology was used to fabricate nanopillars that worked as obstacles in crowded conditions. The results obtained from this project might solve the problem with safe exit of mass people in an emergency situation in a crowded condition or to manage traffic problems in big cities.

3) Silver medal in BIOMOD 2014, Harvard University, USA, November 2014.

Title of the project: Fabrication of artificial muscles from a biomolecular motor

Summary: In this project, the Hokkaido University team under my mentorship proposed to fabricate highly ordered hierarchical structures from the biomolecular motor protein kinesin and the cytoskeletal protein microtubule, so that the structure may work like the muscles in living organisms. Microtubules were polymerized in a highly organized and parallel manner. Multimeric kinesin linkers were prepared using streptavidin-biotin interaction. The multimeric kinesin linkers generated sliding motion of microtubules by consuming energy obtained from hydrolysis of adenosine triphosphate. The sliding motion of microtubules generated a global contractile dynamic in the microtubule network.

4) Silver medal in BIOMOD 2013, Harvard University, USA, November 2013.

Title of the project: An ATP generation system for nanotechnological applications

Summary: In this project, my team established an ATP generation system from ADP by using thylakoid membrane available in chloroplasts of spinach. We synthesized micro sized green gels, that we termed as Marimo-gel, in which we incorporated thylakoid membrane obtained from spinach. The Marimo-gel reproduced ATP from ADP by using the energy from light. The produced ATP was used to drive the biomolecular motor system microtubule/kinesin (*Chemistry Letters*, 2017, 46, 178-180).

5) Monbukagakusho (MEXT) scholarship from the ministry of education, culture, sports, science, and technology of Japan.

Outline of the scholarship: I was the Hokkaido University recommended recipient of this scholarship in support of my enrollment as a doctoral course student in the division of biological sciences of Hokkaido University.
Scholarship period: October 2009- September 2012.

❖ Activities in academic societies

Membership in academic societies:

- ✓ The Australian Society for Biophysics
- ✓ The Biophysical Society of Canada
- ✓ The Biophysical Society of Japan
- ✓ The Society of Polymer Science Japan (SPSJ)
- ✓ Bangladesh Chemical Society

Organizing activities in academic societies:

- ✓ Ranger, Hokkaido Branch, Japan
  The Society of Polymer Science Japan (SPSJ) (2019-2020).
- ✓ Organizer of "The 35th Summer University in Hokkaido and Hokkaido Polymer Young Researcher Study Group 2020".
- ✓ Organizer of "The 34th Summer University in Hokkaido and Hokkaido Polymer Young Researcher Study Group 2019".

[Invited talks]

(1) Arif Md. Rashedul Kabir, Inert chamber system opens a new door to employ biomolecular motor protein systems for nanotechnological applications, Nano Life Science Institute, Kanazawa University, Kanazawa, Japan, 15 May 2018.
https://nanolsi.kanazawa-u.ac.jp/en/post-2301/

(2) Arif Md. Rashedul Kabir and Akira Kakugo, Mechano-responsiveness of microtubule and modulation of its biochemical functions, The 65th Annual Meeting of the Japan Society for Analytical Chemistry, Hokkaido University, Sapporo, Japan, 15 September 2016.

(3) Arif Md. Rashedul Kabir, In situ observation of mechanical stress induced deformation of microtubules, The 13th L & M Seminar, Department of Chemistry, Asahikawa Medical University, 10 December 2014.
http://www.asahikawa-med.ac.jp/dept/ge/chemical/seminar_record.html

(4) Arif Md. Rashedul Kabir, Inert chamber system opens a new door to employ biomolecular motor protein in nanotechnological applications, The 29th Summer University in Hokkaido

(Organized by The Society of Polymer Science Japan, Hokkaido Branch), Hokkaido, Japan, 29-30 August 2014.

(5) Arif Md. Rashedul Kabir, Study on in vitro lifetime of a biomolecular motor and its extension in an inert chamber, Seminar on Supramolecular Systems, Department of Chemistry, University of Dhaka, 15 November 2012.

[Presentations at International Conferences]

Oral presentations

1. **Arif Md. Rashedul Kabir**, Md. Abu Bin Hasan Susan, "Kinetic Investigation on the Alkaline Hydrolysis of Crystal Violet in the Presence of Sodium dodecylbenzenesulfonate", Bangladesh Chemical Congress 2006, March 2007, Dhaka, Bangladesh.
2. **Arif Md. Rashedul Kabir**, Akira Kakugo, Daisuke Inoue, Jian Ping Gong, "Prolongation of the Active Lifetime of Biomolecules Using Inert Environment", International Fusion Bioscience Symposium, March 2011, Hokkaido University, Sapporo, Japan.
3. **Arif Md. Rashedul Kabir**, Yoshiki Tamura, Tamaki Kajihara, Daisuke Inoue, Akira Kakugo, Kazuki Sada, Jian Ping Gong, "Formation of Microtubule Ring at the Air-buffer Interface", The 3rd Asian Symposium on Advanced Materials– *Chemistry & Physics of Functional Materials* –(ASAM-3), September 2011, Fukuoka, Japan.
4. **Arif Md. Rashedul Kabir**, Daisuke Inoue, Akira Kakugo, Kazuki Sada, Jian Ping Gong, "Cleaning and Curing of *In Vitro* Motility Assay System", IGP Symposium 2012, March 2012, Hokkaido University, Sapporo, Japan.
5. **Arif Md. Rashedul Kabir**, Akira Kakugo, Kazuki Sada, "In situ observation of mechanical stress induced fragmentation of microtubules", International Workshop for Motor Proteins toward Emerging Nano Systems, April 2014, Kyoto University, Japan.
6. Md. Sirajul Islam, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "Establishment of Treadmilling Based *In Vitro* Motility System for Microtubules", International Workshop for Motor Proteins toward Emerging Nano Systems, April 2014, Kyoto University, Japan.
7. Md. Sirajul Islam, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "Establishment of an *In Vitro* Motility System for Observing the Treadmilling and Elongation of Microtubules by TIRF Microscopy", 3rd Frontier Chemistry Centre International Symposium, June 2014, Hokkaido University, Japan.
8. Tanjina Afrin, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Effect of Deformation of Microtubule on Kinesin-based Cargo Transportation *In Vitro*", 3rd Frontier Chemistry Centre International Symposium, June 2014, Hokkaido University, Japan.
9. **Arif Md. Rashedul Kabir**, Daisuke Inoue, Hiroyuki Mayama, Kazuki Sada, Akira Kakugo, "Establishment of methodology for fragmentation test of cytoskeletal filaments",

63rd SPSJ Symposium on Macromolecules, September 2014, Nagasaki University, Nagasaki, Japan.

10. Md. Sirajul Islam, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "Study on the effect of ROS in dynamic instability of microtubules *in vitro*", Japan-Taiwan Bilateral Polymer Symposium 2015, September 2015, Hokkaido University, Sapporo, Japan.
11. Daisuke Inoue, **Arif Md. Rashedul Kabir**, Akira Kakugo, "Intelligence of a reconstructed biomolecular motor system", 9th EAI International Conference on Bio-inspired Information and Communications Technologies (formerly BIONETICS), December 2015, New York City, NY, United States.
12. Jakia Jannat Keya, **Arif Md. Rashedul Kabir**, Daisuke Inoue, ,Kazuki Sada, Akinori Kuzuya and Akira Kakugo, "DNA Assisted Control of Swarming of a Biomolecular Motor System", The First International Symposium on Advanced Soft Matter, June 13-15, 2016, Hokkaido University, Japan.
13. Tamanna Ishrat Farhana, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "Collective motion of microtubules with different lengths and rigidity", 6th Soft Mater International Symposium, October 2016, Hokkaido University, Japan.
14. Tamanna Ishrat Farhana, Ai Saito, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "Collective motion of microtubules driven by kinesin", 11th International Gel Symposium, March 2017, Chiba, Japan.

Poster presentations

1. **Arif Md. Rashedul Kabir**, Daisuke Inoue, Akira Kakugo, Kazuki Sada, Jian Ping Gong, "Prolongation of the Active Lifetime of a Biomolecular Motor System for *In Vitro* Motility Assay", The 3rd Asian Symposium on Advanced Materials– *Chemistry & Physics of Functional Materials* –(ASAM-3), September 2011, Fukuoka, Japan.
2. **Arif Md. Rashedul Kabir**, Daisuke Inoue, Akira Kakugo, Kazuki Sada, Jian Ping Gong, "Cleaning and Curing of *In Vitro* Motility Assay System", Soft Interface International Mini symposium on Biomaterials Science (SIMS2012), March 2012, Tsukuba, Japan.
3. Daisuke Inoue, **Arif Md. Rashedul Kabir**, Akira Kakugo, Kazuki Sada, "Motion characteristics of biological molecular motors in static dynamic extension field (microtubule/kinesin system)", 6th Biotechnology and Chemistry Symposium, September 2012, Hokkaido, Japan.
4. **Arif Md. Rashedul Kabir**, Daisuke Inoue, Hiroyuki Mayama, Kazuki Sada, Akira Kakugo, "Shear stress induced fragmentation of microtubules", International Symposium on Advanced Soft Materials, October 2013, Hokkaido University, Japan.

5. Shoki Wada, **Arif Md. Rashedul Kabir**, Masaki Ito, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Formation of ring-shaped assembly of microtubules with a narrow size distribution at an air-buffer interface", International Symposium on Advanced Soft Materials, October 2013, Hokkaido University, Japan.
6. **Arif Md. Rashedul Kabir**, Daisuke Inoue, Hiroyuki Mayama, Kazuki Sada, Akira Kakugo, "Shear stress induced fragmentation of microtubules", The 14th RIES-Hokudai International Symposium, December 2013, Sapporo, Japan.
7. Shoki Wada, **Arif Md. Rashedul Kabir**, Masaki Ito, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Research on ring-shaped microtubules assemblies formed at the air-buffer interface", The 14th RIES-Hokudai International Symposium, December 2013, Sapporo, Japan.
8. **Arif Md. Rashedul Kabir**, Akira Kakugo, Kazuki Sada, "In situ observation of buckling and breakage of microtubules under compressive stress", International Workshop for Motor Proteins toward Emerging Nano Systems, April 2014, Kyoto University, Japan.
9. Tanjina Afrin, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Cargo Transportation by Biomolecular Motor along Deformed Microtubule Track *In Vitro*", The 10th Hokkaido University-Nanjing University Joint Symposium, August 2014, Hokkaido University, Japan.
10. Md. Sirajul Islam, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "Motility System for *In Vitro* Observation of Treadmilling and Elongation of Microtubules by TIRF Microscopy", The 10th Hokkaido University-Nanjing University Joint Symposium, August 2014, Hokkaido University, Japan.
11. **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "In situ observation of compressive stress induced deformation of microtubule", The 15th Ries-Hokudai International Symposium, December 2014, Chateraise Gateaux Kingdom Sapporo, Japan.
12. Ren Sasaki, Shoki Wada, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "Development of artificial cilia by microtubule-kinesin assembly", The 15th Ries-Hokudai International Symposium, December 2014, Chateraise Gateaux Kingdom Sapporo, Japan.
13. Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "Pattern formation of microtubules triggered by stretch stimuli", The 15th Ries-Hokudai International Symposium, December 2014, Chateraise Gateaux Kingdom Sapporo, Japan.
14. Md. Sirajul Islam, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, Akira Kakugo, "*In Vitro* observation of Dynamic Instability and Treadmilling of Microtubules using Inert Chamber System", The 15th Ries-Hokudai International Symposium, December 2014, Chateraise Gateaux Kingdom Sapporo, Japan.
15. Tanjina Afrin, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Biomolecular Motor-based Cargo Transportation along Deformed Microtubule Track *In Vitro*", The 15th Ries-Hokudai International Symposium, December 2014, Chateraise Gateaux Kingdom Sapporo, Japan.

16. Md. Sirajul Islam, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "*In vitro* study of microtubule dynamics in the presence/ absence of ROS", The 4th Frontier Chemistry Center International Symposium, February 2016, Hokkaido University, Japan.

17. Jakia Jannat Keya, Ryuhei Suzuki, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akinori Kuzuya, Akira Kakugo, "Programming of Swarm Robot Based on DNA Processed Biomolecular Motor System", The 4th Frontier Chemistry Center International Symposium, February 2016, Hokkaido University, Japan.

18. Tamanna Ishrat Farhana, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Collective motion of microtubules in presence and absence of external indentation stress" The 4th Frontier Chemistry Center International Symposium, February 2016, Hokkaido University, Japan.

19. Tanjina Afrin, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akira Kakugo, "Effect of deformation of microtubule on biomolecular motor protein-based cargo transportation *in vitro*" The 4th Frontier Chemistry Center International Symposium, February 2016, Hokkaido University, Japan.

20. Jakia Jannat Keya, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, Akinori Kuzuya and Akira Kakugo, "Construction of DNA Programmed Swarm Robots from a Biomolecular Motor System", The 67th Divisional Meeting on Colloid & Interface Chemistry, September 22-24, 2016, Hokkaido University of Education, Asahikawa Campus, Japan.

21. Jakia Jannat Keya, **Arif Md. Rashedul Kabir**, Daisuke Inoue, ,Kazuki Sada, Akinori Kuzuya and Akira Kakugo, "DNA Programmed Logic-Gated Control of Swarming of a Biomolecular Motor System", The 17th RIES-HOKUDAI International Symposium, December 13-14, 2016, Hokkaido, Japan.

22. Tamanna Ishrat Farhana, **Arif Md. Rashedul Kabir**, Daisuke Inoue, Kazuki Sada, and Akira Kakugo, "Effect of external mechanical stress on active self-organization of microtubules", The 67th Divisional Meeting on Colloidal and Surface Chemistry, August 2016, Ashikawa, Japan.

23. Tamanna Ishrat Farhana, Daisuke Inoue, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "Effect of length and rigidity of microtubules on their collective motion", The 17th RIES-Hokudai International Symposium, December 2016, Châteraisé Gateaux Kingdom Sapporo, Japan.

24. Tasrina Munmun, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "Regulation of the motility of a nano-biomolecular machine using trimethylamine-N-oxide", The 7th International Life-Science Symposium for Young Scientists (7th ILSS), November 2019, Hokkaido University, Sapporo, Japan.

25. Tasrina Munmun, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "Complete, rapid and reversible regulation of the motility of a nanobiomolecular machine using trimethylamine-N-oxide", 2nd ICReDD International Symposium, November 2019, Hokkaido University, Sapporo, Japan.

26. Tasrina Munmun, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "A deep-sea osmolyte TMAO regulates the motility of a nano-biomolecular machine", The 20th RIES-HOKUDAI International Symposium, December 2019, Hokkaido University, Sapporo, Japan.

27. Tasrina Munmun, **Arif Md. Rashedul Kabir**, Kazuki Sada, and Akira Kakugo, "Repeated on/off switching of the motility of a nano-biomolecular machine using a deep-sea osmolyte trimethylamine-N-oxide", Hokkaido University-National Central University Joint Symposium on Materials Chemistry and Physics 2019, December 2019, Hokkaido University, Sapporo, Japan.