

CV of Dr. Mohammad Abu Sayem Karal

NATIONALITY: Bangladeshi
DATE OF BIRTH: 10th December, 1980



CONTACT INFORMATION	Professor Department of Physics Bangladesh University of Engineering and Technology (BUET)* Dhaka -1000, Bangladesh (* Ranking one Technological University in Bangladesh)	Cell: +880-1712-863844 Tel: +880-2-9665613 (off) Fax: +880-2-58613046 E-mail: asayem221@phy.buet.ac.bd E-mail: asayem221@yahoo.com http://asayem221.buet.ac.bd/
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RESEARCH AREA

- Biophysics, Membrane Biophysics, Nanomaterials, Bioimpedance measurement, Nerve conduction measurement.
- Mechanism of pore formation in lipid membranes by Nanoparticles, Antimicrobial peptides, Cell penetrating peptides, Mechanical tension and Irreversible Electroporation.

EDUCATIONAL QUALIFICATIONS

DOCTOR OF PHILOSOPHY (PhD) [Oct 2012 - Sept 2015] - Year 2015

Biophysics, Department of Bioscience

Graduate School of Science and Technology, Shizuoka University, JAPAN

Research Keywords: Pore formation, Lipid membranes, Antimicrobial peptides, Mechanical tension, Micropipette aspiration, Confocal microscopy, Optical microscopy

Thesis: The Role of Tension on Antimicrobial Peptide Magainin 2-Induced Pore Formation in Lipid Membranes

Supervisor: Professor Dr. Masahito Yamazaki

MASTER OF PHILOSOPHY (MPhil) [Oct 2008 - Sept 2011] – Year 2011

Materials Sciences, Department of Physics

Bangladesh University of Engineering and Technology (BUET), Dhaka -1000, Bangladesh

Research Keywords: Ribbon typed magnetic materials

Thesis: Transport, Magnetic and Thermal properties of $(\text{Fe}_{100-x}\text{V}_x)_{75}\text{P}_{15}\text{C}_{10}$ Amorphous Ribbons

Supervisor: Professor Dr. Md. Feroz Alam Khan

Result: CGPA 3.67 in a scale 4.0

MASTER OF SCIENCE (MS) [July 2001 - June 2002; held in 2005] – Year 2002

Bio-Medical Physics, Department of Physics

University of Dhaka, Dhaka-1000, Bangladesh

Research Keywords: Focused impedance measurement, Electrical impedance measurement, Physiological study, Instrument of FIM

Thesis: Study a New Four Electrode Focused Impedance Measurement (FIM) System

Supervisor: Professor Dr. Khondker Siddique-e Rabbani

Result: First class First, Marks obtained: 79.5%

BACHELOR OF SCIENCE (BSc) with 4 years Honours [July 1998 – June 2001; held in 2004] – Year 2001

Department of Physics, University of Dhaka, Dhaka-1000, Bangladesh

Specialized subjects: Bio Physics, Medical Physics, Computational Physics, Laser Physics

Result: First class Ninth, Marks obtained: 63.7%

Higher Secondary Certificate (HSC), Science group, Dhaka board – Year 1997

Result: First Division with Star Marks, 76.6%

Secondary School Certificate (SSC), Science group, Dhaka board – Year 1995

Result: First Division with Star Marks, 81.1%

Group Leader

Biophysics Research Laboratory, Department of Physics, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Professional Carrier

Professor [December 20, 2020 to date]

Department of Physics

Bangladesh University of Engineering and Technology (BUET), Dhaka -1000, Bangladesh

- Lecturing courses and conducting laboratory classes in undergraduate and graduate level.
- Supervising graduate students in the Department of Physics, BUET.

Associate Professor [March 12, 2018 – December 19, 2020]

Department of Physics

Bangladesh University of Engineering and Technology (BUET), Dhaka -1000, Bangladesh

- Lecturing courses and conducting laboratory classes in undergraduate and graduate level.
- Supervising graduate students in the Department of Physics, BUET.

Assistant Professor [Dec 28, 2011 – March 11, 2018]

Department of Physics

Bangladesh University of Engineering and Technology (BUET), Dhaka -1000, Bangladesh

- Lecturing courses and conducting laboratory classes in undergraduate and graduate level.
- Assisting newly enrolled post graduate students in their research work in the Department of Physics, BUET.
- Supervising graduate students in the Department of Physics, BUET.

Lecturer [Feb 18, 2008– Dec 28, 2011]

Department of Physics

Bangladesh University of Engineering and Technology (BUET), Dhaka -1000, Bangladesh

- Lectured courses and conducted laboratory classes in undergraduate level
- Completed Master of Philosophy (MPhil) as a part time student

Lecturer [April 02, 2006 – Feb 17, 2008]

Department of Physics

Government B. M. University College, Barisal, Bangladesh

- Stood First position in Physics in 26th Bangladesh Civil Service (BCS)
- Lectured courses and conducted laboratory classes in undergraduate and graduate level

Teaching Courses//Undergraduate Lectures:

- [1] Geometrical Optics [2] Physical Optics [3] Modern Physics [4] Sound
[5] Heat and Thermodynamics [6] Electricity and Magnetism [7] Waves and Oscillations [8] Waves
Mechanics [9] Laboratory Classes

Postgraduate Lectures:

- [1] Medical Physics [2] Radiation Biophysics [3] Health Physics [4] Nuclear Physics

Publications

Text Book: 01, Peer reviewed journals: 34, Peer reviewed proceedings (4–6 pages): 15, Abstracts in conferences presentations: 93

Thesis Supervision

Ph.D: Supervising 03, M. Phil.: Supervising 04, M.Sc.: Supervised 09, supervising 02, Research Assistant: Supervised 01, supervising 03

Principal Investigator of the Research Projects

[1] Mechanism of Nanoparticles-Induced Pore Formation in Lipid Membranes of Vesicles, The World Academy of Science (TWAS), Trieste, Italy (Fiscal year 2019-2021), Amount: USD 16900. (Taka 14,30,000)

[2] Investigation of Nanoparticles-Induced Shape Change and Pore Formation in the Lipid Membranes of Vesicles for Antibacterial Application, Ministry of Education, Government of Bangladesh (Fiscal year 2019-2022) Amount: USD 15500. (Taka 13,00,000)

[3] Irreversible Electroporation Induced Rate Constant of Pore Formation in the Lipid Membranes of Vesicles for Biomedical Application, Ministry of Science and Technology, Government of Bangladesh (Fiscal year 2019-2020) Amount: USD 5600. (Taka 5,00,000)

[4] Development of a Microcontroller Based Electroporation Technique for the Study of Pore Formation in Artificial Nano Membranes targeting Cancer Cell Ablation, ICT Division, Government of Bangladesh (Fiscal year 2019-2021) Amount: USD 19600. (Taka 16,50,000)

[5] Shape Change and Pore Formation in Cell Like Vesicle Using Eco-friendly Synthesized Nanoparticles for Antibacterial Application, University Grants Commission (UGC), Bangladesh (Fiscal year 2020-2021) Amount: USD 3500. (Taka 3,00,000)

[6] Effects of Cholesterol on the Irreversible Electroporation (IRE) Induced Rupture of Cell like Vesicles for Biomedical Application, Advanced Studies and Research, BUET, Dhaka Bangladesh (Fiscal year 2020-2021) Amount: USD 8150. (Taka 6,84,500)

[7] Investigation of Pore Formation in Lipid Membranes of Giant Unilamellar Vesicles (GUVs) Using Electroporation for The Possible Application in Cancer Cell Ablation, Ministry of Science and Technology, Government of Bangladesh (Fiscal year 2016-2019) Amount: USD 20240. (Taka 17,00,000)

[8] Synthesis of Artificial Membranes for the Possible Application in Cancer Cell Destruction and Antibacterial Effect Examination, Ministry of Education, Government of Bangladesh (Fiscal year 2017-2019) Amount: USD 17700. (Taka 15,00,000)

[9] Study of Pore Formation in Lipid Membranes using Electroporation for Possible Application in Cancer Cell Ablation, Advanced Studies and Research, BUET, Dhaka Bangladesh (Fiscal year 2017-2018) Amount: USD 8000. (Taka 6,70,000)

[10] Water Spinach Leaf Extract Mediate Green Synthesis of Magnetite Nanoparticles and its Antibacterial Application, University Grants Commission Bangladesh, (Fiscal year 2017-2018) Amount: USD 3100. (Taka 2,60,000)

Awards, Fellowships and Honors

- Guest Associate Professor for outstanding research and contribution in Biophysics, awarded by

Shizuoka University, Japan (April 2017 – March 2019).

- Guest Associate Professor for outstanding research and contribution in Biophysics, awarded by Shizuoka University, Japan (Nov. 2015 – March 2017).
- Japan Government Scholarship (Monbukagakusho) for PhD study in the period of Oct 2012 – Sept 2015 through Shizuoka University recommendation
- Research fellowship, Ministry of Science & ICT, Government of the People's Republic of Bangladesh, FY 2010-2011
- Research fellowship, Ministry of Science & ICT, Government of the People's Republic of Bangladesh, FY 2009-2010
- Book Prize for 1st class 1st in MS (Thesis group) from University of Dhaka (2002)
- Scholarship for undergraduate result, University of Dhaka (2001)
- Fazlul Haque Hall scholarship, University of Dhaka (1999)

Administrative Works

- Assistant Provost, Nazrul Islam Hall, BUET, Dhaka, Bangladesh (May 2016 to date)
- Member Secretary, Board of Post Graduate Studies (BPGS), Department of Physics, BUET, Dhaka, Bangladesh (March 2018 to September 2020)
- Member Secretary, Board of Undergraduate Studies (BUGS), Department of Physics, BUET, Dhaka, Bangladesh (November 2015 to March 2018)
- As a Secretary of BPGS/BUGS of the Department of Physics, BUET, on behalf of the Head of the Department I have to call upon the BPGS/BUGS meetings for various purposes, i.e., course distribution, paper setter, examiner and scrutinizer selection, teacher assistantship (TA) for selection undergraduate laboratories etc.
- Routinely provide instructions to laboratory assistants/attendants about the uses of instruments in the laboratory.

Trainings and Workshops

- Workshop on the “Use of CASR Proposal Submission Portal” organized by Institutional Quality Assurance Cell (IQAC), BUET, Dhaka (September 19, 2020)
- Workshop on “Microsoft Teams” organized by Institutional Quality Assurance Cell (IQAC), BUET, Dhaka (September 02, 2020)
- Workshop on “Learning Management System 'Moodle': Essentials for Administrators” organized by Institutional Quality Assurance Cell (IQAC), BUET, Dhaka (August 9-10, 2020)
- Workshop on “Training on Office 365 Education” organized by ICT-Cell, BUET, Dhaka (July 20, 2020)
- Workshop on “Learning Management System: Moodle” organized by Institutional Quality Assurance Cell (IQAC), BUET, Dhaka (July 14-15, 2020)
- Training workshop on “Learning Management System: Moodle” organized by Institutional Quality Assurance Cell (IQAC), BUET, Dhaka (February 26, 2018)
- Training workshop on “Writing Learning Outcomes” organized by Institutional Quality Assurance Cell (IQAC), BUET, Dhaka (December 23, 2016)
- Workshop on Knots and Links in Biological and Soft Matter, ICTP, Trieste, Italy, 26-30 Sept. 2016.
- Training on Radiation Protection, Shizuoka University, Japan (April 25, 2014)
- Training on Radiation Protection, Shizuoka University, Japan (April 19, 2013)
- Land Use Planning, organized by Directorate of Continuing Education, BUET, Dhaka, Bangladesh, 23-24 August, 2008.
- The Public Procurement in Bangladesh, organized by Directorate of Continuing Education, BUET, Dhaka, Bangladesh, 19-23 July, 2008.
- Teachers’ Appreciation Workshop organized by Directorate of Continuing Education, BUET, Dhaka, Bangladesh, 12-13 March, 2008.
- Short Course on Biomedical Instrumentation organized by Directorate of Continuing Education, BUET, Dhaka, Bangladesh, 03-07 May, 2008.

Memberships

- Student Member, Japan Biophysical Society [2013 - 2016]
- Life Member, Bangladesh Medical Physics Association (BMPA)
- Life Member, Bangladesh Physical Society (BPS)
- Life member, Bangladesh Academy of Advancement and Science (BAAS)
- Life Member, Dhaka University Alumni Association (DUAA)
- Life Member, Registered Graduate, University of Dhaka, Bangladesh
- Member, BUET Alumni Association
- Member, UNESCO Club Association, Bangladesh

Conferences Responsibilities

- Session Chair International Conference on Physics in Medicine, Organized by BAEC, BMPA and BMPT-DU, Dhaka, Bangladesh, 06-07 February, 2020
- Member, Organizing Committee, International Conference on Nanotechnology and Condensed Matter Physics, BUET, Bangladesh, 11-12 January, 2018
- Session Co-chair, International Conference on Nanotechnology and Condensed Matter Physics, 11-12 January, 2018, BUET, Bangladesh,
- Session Co-chair, National Conference on Physics, 05-07 January 2017, Dhaka, Bangladesh
- Member, Organizing Committee, “International Physical Conference”, 15-17 May 2009, Dhaka, Bangladesh, Organized by Bangladesh Physical Society.
- Member, Organizing Committee, “International Conference on Magnetism and Advanced Materials (ICMAM-2010)”, 03-07 March 2010, Jointly organized by Department of Physics of BUET, Dhaka and Materials Science Division, AECD, Dhaka, Bangladesh, Sponsored by International Science Programme (ISP), Uppsala University, Sweden.
- Member, Organizing Committee, “National Conference on Physics for Development”, 10- 11 February 2011, Dhaka, Bangladesh, Organized by Bangladesh Physical Society.

Examiners

- Department of Physics, University of Dhaka
- Department of Theoretical Physics, University of Dhaka
- Department of Biomedical Physics and Technology, University of Dhaka
- Department of Physics, Jessore Science and Technology University, Jessore
- Department of Environmental Sciences, Jessore Science and Technology University, Jessore
- Department of Physics, National University, Gazipur
- Department of Physics, Jagannath University, Dhaka
- Department of Physics, Barisal University, Barishal

Laboratory Development

After doing my Ph.D. degree in Bioscience from Japan, I returned to the Department and set-up a Biophysics Research Laboratory in the Department of Physics, BUET. In this regard, at first, I have to manage a space in the Department and then managed some financial supports for its infrastructure development from BUET authority. So far, I have found some research grants for the development of research facilities from different organizations. Moreover, I have submitted a few proposals for more research grants in home and abroad. Currently, I am working as a Group Leader of Biophysics Research Laboratory in BUET.

Syllabus Development

- A syllabus for the Biophysics theory course was designed for the postgraduate studies in the Department of Physics, BUET. The course has been approved by the faculty of Engineering, BUET. Now it is waiting for the approval of Academic Council of BUET.
- As a Secretary of Board of Undergraduate Studies (BUGS) of the Department of Physics, BUET, I

have actively worked for the preparation of revised syllabus of Physics theory and sessional courses (total 5 courses) offered by the Department of Materials and Metallurgical Engineering (MME), BUET.

Other Activities

- Local Subject Expert, External Peer Review Team (EPRT) on Quality Assurance (QA) aspects of the Department of Biomedical Physics and Technology, University of Dhaka, Bangladesh of duration 11-13 December, 2017. The team comprised of Foreign QA Expert, Local QA Expert and Local Subject Expert
- External member, Tender Evaluation Committee, Department of Biomedical Physics and Technology, University of Dhaka.
- Member, Academic Council, BUET.
- Member, Faculty of Engineering, BUET
- Member, Board of Undergraduate Studies (BUGS), Department of Physics, BUET.
- Member, Board of Postgraduate Studies (BPGS), Department of Physics, BUET
- Examiner and Scrutinizer in undergraduate examinations.
- Examiner and Scrutinizer in postgraduate examinations.
- Examiner and Scrutinizer for the Undergraduate Admission Test in several years.

Research Collaborators

[1] Professor Dr. Victor Levadnyy

Senior Scientist

Theoretical Problem Center of Physico-Chemical Pharmacology, Russian Academy of Sciences
Moscow 117977, Russia

Email: levadny@commgroup.ru

[2] Professor Dr. Marina Belaya

Department of Mathematics, Russian State University for the Humanities

Moscow GSP-3 125993, Russia

Email: Mbelaya@mail.ru

[3] Professor Dr. Masahito Yamazaki

Biophysics Laboratory, Department of Bioscience

Graduate School of Science and Technology

Shizuoka University, Japan

Email: spmyama@ipc.shizuoka.ac.jp

[2] Professor Dr. Khondker Siddique-e Rabbani

Department of Bio-Medical Physics & Technology

University of Dhaka, Bangladesh

Tel: +88-02-9661920-73 (Ext.7011, 7001), +88-01817022834 (cell)

Email: ksrabbani@gmail.com

[5] Dr. Zaid Bin Mahbub

Assistant Professor

Department of Mathematics and Physics

North South University, Dhaka-1229, Bangladesh

Email: zaidbin@gmail.com

Language skills English (Fluent), Japanese (Simple communications)

Country visit: Japan, Italy, Nepal

PERSONAL INFORMATION

Father: Mohammad Dadon Karal

Mother: Shanti Begum

Place of birth: Vill: Baburchar, Upazilla: Sadarpur, District: Faridpur, Bangladesh

Marital status: Married

Wife Occupation: BCS Education (Presently on Deputation, Bangladesh National Commission for UNESCO, Ministry of Education)

Religion: Islam (Sunni)

House address: 30/4C, BUET Teacher's Quarter (White Quarter), BUET Campus, Dhaka

PUBLICATIONS:

Text Book: 01, Peer reviewed journals: 34, Peer reviewed proceedings (4 – 6 pages): 15, Abstracts in conferences presentations: 93

Text BOOK:

[1] Name of author: Dr. Mohammad Abu Sayem Karal

Name of the Book: Biomedical Physics

Course content: Undergraduate final year and Postgraduate level

Written language: Bengali

Publication date: Publish from Prothoma (published January 2019)

(A publishing company of Prothom Alo, Bangladesh)

Research BOOK:

[1] M.S. Thesis published as a book from VDM Verlag Dr. Muller GmbH & Co. KG

Title of the book: Study a New Four-Electrode Focused Impedance Measurement (FIM) System

ISBN: 978-3-639-33055-7

Peer Reviewed Journals [Impact Factor = I.F.]:

[34] Malay Kumar Sarkar, Mohammad Abu Sayem Karal, Marzuk Ahmed, Md. Kabir Ahamed, Shareef Ahammed, Sabrina Sharmin and Sayed Ul Alam Shibly; Effects of osmotic pressure on the irreversible electroporation in giant lipid vesicles; **PLoS ONE** (PLOS), 16(5): e0251690 (2021) DOI: doi.org/10.1371/journal.pone.0251690 [I.F. 2.740]

[33] Marzuk Ahmed, Mohammad Abu Sayem Karal, Md. Kabir Ahamed and Muhammad Samir Ullah; Analysis of purification of charged giant vesicles in a buffer using their size distribution; The **European Physical Journal E** (Springer Nature), 44 (4), 62 (2021) DOI: doi.org/10.1140/epje/s10189-021-00071-4 [I.F. 1.812]

[32] Mohammad Abu Sayem Karal, Md. Kabir Ahamed, Urbi Shyamolima Orchi, Md. Towhiduzzaman, Marzuk Ahmed, Shareef Ahammed, Nadia Akter Mokta, and Muhammad Samir Ullah; An investigation on the critical tension of electroporation in anionic lipid vesicles; **European Biophysics Journal** (Springer Nature) 50, 99-106 (2021) https://doi.org/10.1007/s00249-020-01477-2 [I.F. 2.094]

[31] Mohammad Abu Sayem Karal, Urbi Shyamolima Orchi, Md. Towhiduzzaman, Md. Kabir Ahamed, Marzuk Ahmed, Shareef Ahammed, Nadia Akter Mokta, Sabrina Sharmin and Malay Kumar Sarkar; Electrostatic effects on the electrical tension-induced irreversible pore formation in giant unilamellar vesicles; **Chemistry and Physics of Lipids** (Elsevier) 231, 104935 (2020) DOI:

doi.org/10.1016/j.chemphyslip.2020.104935 [I.F. 2.094]

[30] Mohammad Abu Sayem Karal, Md. Kabir Ahamed, Nadia Akter Mokta, Marzuk Ahmed and Shareef Ahammed; Influence of cholesterol on electroporation in lipid membranes of giant vesicles; *European Biophysics Journal* (Springer Nature), 49, 361-370 (2020) DOI: doi.org/10.1007/s00249-020-01443-y [I.F. 2.094]

[29] (Joint First Author) Md. Kabir Ahamed, Mohammad Abu Sayem Karal, Marzuk Ahmed and Shareef Ahammed; Kinetics of irreversible pore formation under constant electrical tension in giant unilamellar vesicles; *European Biophysics Journal* (Springer Nature), 49, 371-381 (2020). DOI: doi.org/10.1007/s00249-020-01440-1 [I.F. 2.094]

[28] Mohammad Abu Sayem Karal, Md. Kabir Ahamed, Marzuk Ahmed, Shareef Ahammed and Zaid Bin Mahbub; Location of Peptide-Induced Submicron Discontinuities in the Membranes of Vesicles Using ImageJ; *Journal of Fluorescence* (Springer Nature), 30, 735–740 (2020). DOI: doi.org/10.1007/s10895-020-02560-9 [I.F. 2.093]

[27] Mohammad Abu Sayem Karal, Shareef Ahammed, Victor Levadny, Marina Belaya, Md. Kabir Ahamed, Marzuk Ahmed, Zaid Bin Mahbub and A. K. M. Atique Ullah; Deformation and poration of giant unilamellar vesicles induced by anionic nanoparticles; *Chemistry and Physics of Lipids* (Elsevier), 230, 104916 (2020). DOI: doi.org/10.1016/j.chemphyslip.2020.104916 [I.F. 2.094]

[26] Mohammad Abu Sayem Karal, Marzuk Ahmed, Victor Levadny, Marina Belaya, Md. Kabir Ahamed, Mostafizur Rahman, and Md. Mostofa Shakil; Electrostatic interaction effects on the size distribution of self-assembled giant unilamellar vesicles; *Physical Review E* (American Physical Society-APS), 101, 012404 (2020). DOI: doi.org/10.1103/PhysRevE.101.012404 [I.F. 2.296]

[25] Mohammad Abu Sayem Karal, Md. Kamrul Islam and Zaid Bin Mahbub; Study of molecular transport through a single nanopore in the membrane of giant unilamellar vesicle using COMSOL simulation; *European Biophysics Journal* (Springer Nature), 49(1), 59–69 (2020). DOI: doi.org/10.1007/s00249-019-01412-0 [I.F. 2.094]

[24] Mohammad Abu Sayem Karal, Md. Kabir Ahamed, Mostafizur Rahman, Marzuk Ahmed, Md. Mostofa Shakil, Khondkar Siddique-e-Rabbani; Effects of electrically-induced constant tension on giant unilamellar vesicles using irreversible electroporation; *European Biophysics Journal* (Springer Nature), 48(8), 731–741 (2019). DOI: doi.org/10.1007/s00249-019-01398-9 [I.F. 2.094]

[23] Shamor Kanti Roy, Mohammad Abu Sayem Karal, Muhammad Abdul Kadir, Khondkar Siddique-e Rabbani; A new six-electrode electrical impedance technique for probing deep organs in the human body; *European Biophysics Journal* (Springer Nature), 48(8), 711–719 (2019). DOI: doi.org/10.1007/s00249-019-01396-x [I.F. 2.094]

[22] Mohammad M. Zaman, Mohammad Abu S. Karal, Mohammed Nazrul I. Khan, Abu Rayhan M. Tareq, Shareef Ahammed, Mahmuda Akter, Aslam Hossain, A. K. M. Atique Ullah; Eco-Friendly Synthesis of Fe₃O₄ Nanoparticles Based on Natural Stabilizers and Their Antibacterial Applications; *ChemistrySelect* (Wiley Online Library), 4, 7824–7831 (2019). DOI: doi.org/10.1002/slct.201901594 [I.F. 1.811]

[21] Mohammad Abu Sayem Karal, Mostafizur Rahman, Md. Kabir Ahamed, Sayed Ul Alam Shibly, Marzuk Ahmed, Md. Mostofa Shakil; Low cost non-electromechanical technique for the purification of giant unilamellar vesicles; *European Biophysics Journal* (Springer Nature), 48(4), 749–759 (2019). DOI: doi.org/10.1007/s00249-019-01363-6 [I.F. 2.094]

- [20] (Joint First Author) Moynul Hasan, Mohammad Abu Sayem Karal, Victor Levadny, and Masahito Yamazaki; Mechanism of Initial Stage of Pore Formation Induced by Antimicrobial Peptide Magainin 2; *Langmuir* (American Chemical Society), 34, 3349–3362 (2018). DOI: 10.1021/acs.langmuir.7b04219 [I.F. 3.557]
- [19] Shibly Sayed Ul Alam, Chiranjib Ghatak, Mohammad Abu Sayem Karal, Md. Moniruzzaman and Masahito Yamazaki; Experimental Estimation of Membrane Tension Induced by Osmotic Pressure; *Biophysical Journal* (Elsevier), 111, 2190–2201 (2016). DOI: <http://dx.doi.org/10.1016/j.bpj.2016.09.043> [I.F. 3.854]
- [18] Sabrina Sharmin, Md. Zahidul Islam, Mohammad Abu Sayem Karal, Shibly Sayed Ul Alam, Hideo Dohra, and Masahito Yamazaki; Effects of lipid compositions on the entry of cell-penetrating peptide oligoarginine into a single vesicle; *Biochemistry* (American Chemical Society), 55, 4154–4165 (2016). DOI: 10.1021/acs.biochem.6b00189 [I.F. 2.865]
- [17] Mohammad Abu Sayem Karal, Victor Levadny and Masahito Yamazaki; Analysis of Constant Tension-Induced Rupture of Lipid Membranes Using Activation Energy; *Physical Chemistry Chemical Physics (PCCP)*, (Royal Society of Chemistry - RSC) 18, 13487–13495 (2016). DOI: 10.1039/C6CP01184E [I.F. 3.430]
- [16] Mohammad Abu Sayem Karal, and Masahito Yamazaki; Activation Energy of Tension-Induced Pore Formation in Lipid Membranes; *The Journal of Chemical Physics* (American Institute of Physics - AIP) 143, 081103 (2015). DOI: 10.1063/1.4930108 [I.F. 2.991]
- [15] Mohammad Abu Sayem Karal, Victor Levadny, Taka-aki Tsuboi, Marina Belaya, and Masahito Yamazaki; Electrostatic Interaction Effects on Tension-Induced Pore Formation in Lipid Membranes; *Physical Review E* (American Physical Society - APS) 92, 012708 (2015). DOI: <http://dx.doi.org/10.1103/PhysRevE.92.012708> [I.F. 2.296]
- [14] Mohammad Abu Sayem Karal, Jahangir Md. Alam, Tomoki Takahashi, Victor Levadny, and Masahito Yamazaki; Stretch-Activated Pore of the Antimicrobial Peptide, Maganin 2; *Langmuir* (American Chemical Society - ACS), 31, 3391–3401 (2015). DOI: 10.1021/la503318z [I.F. 3.557]
- [13] M. A. S. Karal, M. Kamruzzaman, D. K. Saha and F. A. Khan; Characterization of Fe₆₉V₆P₁₅C₁₀ Metallic Alloys; *Bangladesh Journal of Physics*, 18, 53–63 (2015).
- [12] Md. Zahidul Islam, Jahangir Md. Alam, Yukihiro Tamba, Mohammad Abu Sayem Karal, and Masahito Yamazaki; The Single GUV Method for Revealing the Functions of Antimicrobial, Pore-forming Toxin, and Cell-penetrating Peptides or Proteins; *Physical Chemistry Chemical Physics (PCCP)*, (Royal Society of Chemistry - RSC), 16, 15752–15767 (2014). DOI: 10.1039/C4CP00717D [I.F. 3.430]
- [11] Md. Kamruzzaman, Md. Abu Sayem Karal, Dilip Kumar Saha and Feroz Alam Khan; Crystallization, Transport and Magnetic Properties of the Amorphous {Fe_(1-x)Mn_x}₇₅P₁₅C₁₀ Alloys, *Journal of Crystallization Process and Technology* (Scientific Research), 2, 105–110 (2012). DOI: 10.4236/jcpt.2012.23013 [Google-based I.F. 0.79]
- [10] M. A. S. Karal, M. Kamruzzaman and F. A. Khan; Transport and magnetic properties of (Fe_{100-x}V_x)₇₅P₁₅C₁₀ amorphous alloys, *J. of Bangladesh Academy of Sciences*, 35(2), 161–169 (2011). [RG I.F. 0.17]

- [9] H. M. I. Jaim, K. Bärner, F. A. Khan, M. Kamruzzaman and M. A. S. Karal; Magnetic and transport properties of $\text{Ni}_{0.5}\text{Zn}_{0.5}\text{Fe}_2\text{O}_4$, *Bangladesh J. of Physics*, Vol (8 - 9), 77–84 (2011).
- [8] M. Kamruzzaman, M. K. R. Khan, M. M. Rahman, M. A. S. Karal, M. Shahjahan and M. Rafiqul Ahsan; Electrical, magnetic and dielectric properties of $\text{Zn}_{1-x}\text{Cd}_x\text{O}$ synthesis system, *Int. J. of Modern Physics B*, World Scientific, 25(25), 3353–3360 (2011). DOI: 10.1142/S0217979211101612 [I.F. 0.863]
- [7] M. A. S. Karal, M. Kamruzzaman, M. G. M. Hossain, H. M. I. Jaim and F. A. Khan; Transport, magnetic and thermal properties of $(\text{Fe}_{100-x}\text{V}_x)_{75}\text{P}_{15}\text{C}_{10}$ semi-amorphous ribbons, *The Nucleus* (A Quarterly International Scientific Journal), 48(2), 83–89 (2011).
- [6] M. A. S. Karal, K. Bärner, M. Kamruzzaman, D. K. Saha, and F. A. Khan; Recrystallization phenomena in melt-spun $(\text{Fe}_{100-x}\text{V}_x)_{75}\text{P}_{15}\text{C}_{10}$ alloys, *International J. of Basic and Applied Sciences*, 11(1), 54–58 (2011). [Google-based I. F. 2.60]
- [5] M. A. S. Karal and K. S. Rabbani; Sensitivity of the new four-electrode focused impedance measurement (FIM) system for objects with different conductivity, *Dhaka University J. of Sciences*, 58(1), 45–47 (2010).
- [4] M. Kamruzzaman, M. K. R. Khan, M. M. Rahman, M. A. S. Karal, M. Shahjahan and M. G. M. Chowdhury; Synthesis and characterization of $\text{Zn}_{1-x-y}\text{Cd}_x\text{Li}_y\text{O}_\delta$ solid solution, *The Nucleus* (A Quarterly International Scientific Journal), 46 (1-2), 37–42 (2009).
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Date of Birth: December 10, 1980

having completed the approved course of study and passed the examinations in Bioscience in the Graduate School of Science and Technology, Educational Division has been duly admitted to the Degree of

Doctor of Philosophy

September 18, 2015
Serial Number: STK 304



ITOH Yukihiro
President of Shizuoka University

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Shizuoka University

Has the Great Pleasure
to award

Dr. Mohammad Abu Sayem Karal
the Diploma of

Honorable Guest Associate Professor

**For outstanding and exemplary performance and
contributions in the field of Biophysics,**

**For which the entire staff and students of the university are
grateful and shall persevere to emulate in all of our endeavors
as we stride in positive fashion into this world of opportunity.**

A handwritten signature in black ink, appearing to read 'Hidenori Mimura'.

Dr. Hidenori Mimura
Director of Research Institute of Electronics,
National University Corporation Shizuoka University

Date: April. 1, 2017



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Dr. Hidenori Mimura
Director of Research Institute of Electronics,
National University Corporation Shizuoka University

Date: December. 1, 2015