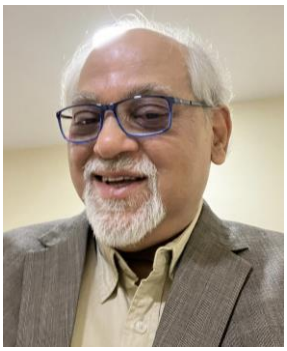
Prof. Amitabha Chattopadhyay



Present Position and Address: CSIR Bhatnagar Fellow
Professor and Founding Dean, Biological Sciences
Academy of Scientific & Innovative Research
CSIR-Centre for Cellular & Molecular Biology
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India

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Education:

B.Sc. (Chemistry Hons.), St. Xavier's College, Calcutta, 1977
M.Sc. (Chemistry), Indian Institute of Technology, Kanpur, 1980
Ph.D. (Chemistry), State University of New York at Stony Brook, 1987

Honors and Awards:

- The World Academy of Sciences (TWAS) Prize in Biology (2016)
- CSIR Bhatnagar Fellowship (2021)
- Shanti Swarup Bhatnagar Prize in Biological Sciences (2001)
  (by the Prime Minister of India for Outstanding Research Achievements)
- Ranbaxy Research Award (Medical Sciences – Basic Research) (2007)
- J.C. Bose Fellowship (Department of Science & Technology) (2008)
- SERB Distinguished Fellowship (2017)

- INSA Distinguished Lecture Fellowship (2023)
- Acharya J.C. Bose Endowment Award (2023) (Indian Photobiology Society)
- Acharya P.C. Ray Memorial Award (2020) (Indian Chemical Society)
- Prof. G.N. Ramachandran Gold Medal (2019) (CSIR)

- Prof. G.N. Ramachandran 60th Birthday Commemoration Medal (2015) (INSA)
- Sreenivasaya Memorial Award (2000) (Society of Biological Chemists, India)
- Dozor Visiting Fellow, Ben Gurion University, Israel (2006)
- Member, Guha Research Conference (1997)

- Fellow, The World Academy of Sciences (2017)
- Fellow, The Royal Society of Biology (2017)
- Fellow, The Royal Society of Chemistry (2013)
- Fellow, Indian National Science Academy (2005)
- Fellow, Indian Academy of Sciences (1999)
- Fellow, The National Academy of Sciences, India (1998)
- Fellow, West Bengal Academy of Science & Technology (2010)
- Fellow, Andhra Pradesh Akademi of Sciences (2003)
- Fellow, Telangana Academy of Sciences (2015)

- Visiting Professor, Paul Sabatier Universite Toulouse III and the Institut de Pharmacologie et Biologie Structurale (IPBS-UPS/CNRS), France (2019)
- Distinguished Visiting Professor, Department of Chemistry, Indian Institute of Technology Bombay, Mumbai (2018-present)
- Adjunct Professor, Indian Institute of Science Education and Research, Kolkata (2018-present)
- Member, Academy of Scientific and Innovative Research (AcSIR) Senate (2011-16; 2018-21)
- Adjunct Professor, Faculty of Science, Engineering and Technology, Swinburne University of Technology, Hawthorn (Victoria), Australia (2016-present)
- Honorary Professor, Amity Institute of Biotechnology, Gurgaon (2016-present)
- Adjunct Professor, Department of Biosciences and Bioengineering, Indian Institute of Technology, Guwahati (2016-18)
- Adjunct Professor, School of Applied Sciences, Royal Melbourne Institute of Technology, Australia (2015-present)
- Adjunct Professor, Tata Institute of Fundamental Research, Mumbai (2015-21)
- Adjunct Professor, Biological Sciences and Bioengineering, Indian Institute of Technology, Kanpur (2014-18)
- Adjunct Professor, Indian Institute of Science Education and Research, Mohali (2010-18)
- Adjunct Professor, Special Centre for Molecular Medicine, Jawaharlal Nehru University, New Delhi (2008-present)
- Honorary Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India (2004-present)

- J.C. Bose Travel Award (Indian Biophysical Society) (2014)
- Indo-Australia Senior Scientist Visiting Fellowship (2012)
- Wellcome Trust Travel Fellowship (2002)
- International Travel Grant (Biophysical Society, U.S.A.) (2002)
- Raman Research Fellowship (CSIR) (1996)
- Wood/Whelan Fellowship (IUBMB) (1992)
- International Union of Biochemistry (IUB) Travel Fellowship (1991)

- Samuel A. Talbot Award (Biophysical Society, U.S.A.) (1986)
- Graduate Research Fellowship (SUNY, Stony Brook) (1983-87)
- Graduate Teaching Assistantship (SUNY, Stony Brook) (1980-83)
- Devaprabhakara Memorial Award (Chemical Society, Indian Institute of Technology, Kanpur) (1979)
- MCM Fellowship (Indian Institute of Technology, Kanpur) (1978-80)

- CSIR Foundation Day Lecture (CSIR-IIIM), Jammu (2022)
- Dr. BK. Bachhawat Memorial Oration (IICB, Kolkata) (2021)
- McBain Memorial Lecture (NCL, Pune) (2019)
- 6th G.K. Manna Memorial Lecture Award (India Congress of Cytology and Genetics, Kolkata) (2018)
- University of Manitoba Distinguished Visiting Lecturer (2013)
- Dr. R.A. Mashelkar Endowment Lecture (2015)
- Prof. Anil K. Lala Memorial Lecture (IIT Bombay) (2013)
- Prof. B.K. Bachhawat Memorial Lecture (IMTECH, Chandigarh) (2011)
- Founder's Day Lecture, IICT, Hyderabad (2011)
- Darshan Ranganathan Memorial Lecture Award (CRSI) (2011)
- CSIR Foundation Day Lecture (IICB, Kolkata) (2010)
- The Bires Chandra Guha Memorial Lecture (INSA) (2008)
- Bimala Churn Law Memorial Lecture (IACS, Kolkata) (2007)
- TWAS-UNESCO Associateship (2003)

Professional and Academic Activities:

(i) *Editorial responsibilities*:

- Editor-in-Chief, ***The Journal of Membrane Biology (***from 2024)
- Associate Editor, ***The Journal of Membrane Biology (***2020-present)
- Academic Editor, ***FEBS Letters*** (Elsevier) (2012-present)
- Member, Editorial Board, ***Biophysical Reviews*** (2022-present)
- Associate Editor, ***Molecular Membrane Biology*** (2016-2019)
- Member, Editorial Board, ***IUBMB Life*** (2016-2019)
- Section Editor, ***The Journal of Membrane Biology*** (2015-2019)
- Regional Editor, the ***Journal of Fluorescence*** (Springer) (2009-present)
- Member, Editorial Advisory Board of ***ACS Chemical Neuroscience (***2014-present)
- Member, Editorial Board (section editor) of ***Biochimica et Biophysica Acta – Biomembranes*** (Elsevier) (2007-present)
- Member, Advisory Editorial Board of ***European Biophysics Journal*** (Springer) (2005-present)
- Member, Editorial Advisory Board of ***Chemistry and Physics of Lipids*** (Elsevier), (2004-present)
- Member, Editorial Board of ***Bioscience Reports*** (Springer) (2004-2018)
- Review Editor, ***Frontiers in Physiology (Membrane Physiology and Membrane Biophysics)*** (2010-present)

- Member, Editorial Board of ***Biophysical Journal*** (Cell Press) (2009-2015)
- Member, Editorial Board of ***Cellular and Molecular Neurobiology*** (Springer) (2003-2023)
- Handling Editor, the ***Journal of Neurochemistry*** (Wiley-Blackwell) (2011-2014)
- Member, Editorial Board of ***PeerJ*** (2012-2014)
- Member, Editorial Advisory Board of the ***Journal of Physical Chemistry*** (ACS publication) (2011-2015)
- Member, Editorial Board of the ***Journal of Biosciences*** (Indian Academy of Sciences and Springer) (2004-2019)
- Member, Editorial Board of the ***Journal of Fluorescence*** (Springer) (1999-2009)
- Member, Editorial Advisory Board of ***Molecular Membrane Biology*** (Taylor & Francis) (1996-2016)

(ii) *Other responsibilities*:

- Chairman, National Committee of International Union of Pure and Applied Biophysics (IUPAB) (2022-2023; 2024-2026)
- President, Society for Neurochemistry India (SNCI) (2023-2024)
- Member, International Advisory Committee of Diamond Jubilee Celebration of Indian Photobiology Society & 4th International Conference of School of Applied Sciences, KIIT, Bhubaneswar, India, 2023
- Member, Council of Indian National Science Academy (2020-2022)
- Member, Scientific Committee, Faraday Discussion on Peptide-Membrane Interactions, London, UK, 8-10 September, 2021
- Member, Steering Committee of the DBT-Boost to University Interdisciplinary Life Science Departments for Education and Research program (DBT-BUILDER) at Birla Institute of Technology and Science (BITS) Pilani (2023-)
- Member, Science Education Panel, Indian Academy of Sciences (2019-2021)
- Member, Wellcome Trust DBT India Alliance's Early Career Fellowship Selection Committee (2016-2022)
- Member, Board of Studies of Biological Sciences, Academy of Scientific and Innovative Research (2017-2019)
- Advisor, Hyderabad Chapter, The National Academy of Sciences, India, (2018-present)
- Co-Chairperson, Recruitment and Assessment Center, Defence Research & Development Organization, Govt. of India (2018-)
- Member, Scientific Advisory Committee, International Congress of Cell Biology (2018)
- Member, Award Selection Committee of the Society of Biological Chemists (India) (2017-2018)
- Member, Sectional Committee (Chemistry) of the Indian Academy of Sciences (2016-2018)
- Member, Research Council, Dr. Reddy's Institute of Life sciences, Hyderabad (2015-present).
- Member, Weber Prize Committee (2008, 2014)
- Member, Executive Committee, Fluorescence Society (2014-present)
- Member, Program Committee, International Biophysics Congress, Brisbane (2014)

- Corresponding member, International Conference on the Bioscience of Lipids (ICBL) steering committee (2014-2016)
- Member, National Advisory Committee of the 14th Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB) (2015)
- Member, Board of Studies for Biological and Chemical Sciences, Academy of Scientific and Innovative Research (2015-2018)
- Member, Governing Board, CCMB Science Foundation (2016)
- Mentor, DST INSPIRE Internship Autumn Camp, Dr..K.C.B. Govt. PG College, Bhilai (2013)
- Member, Expert Panel, DST workshop on "*Advanced Materials and Delivery Devices*", Indian Institute of Technology, Mumbai, 25-26 February, 2013
- Co-Chair, Organizing Committee, ***10th International Symposium on Biochemical Roles of Eukaryotic Cell Surface Macromolecules***, Kolkata, 20-24 January, 2014
- Chair, Biophysical Society thematic meeting ***Lipid-protein Interactions in Membranes: Implications for Health and Disease***, Centre for Cellular and Molecular Biology, Hyderabad, 1-5 November, 2012
- Member, International Society of Neurochemistry-American Society of Neurochemistry (ISN-ASN) Program Committee for the 2013 joint ISN-ASN meeting
- Reviewer, The Italian Research and University Evaluation Agency (ANVUR)
- Reviewer, The Portuguese Foundation for Science and Technology (FCT)
- Member, National Committee for International Union of Biological Sciences of the Indian National Science Academy (2011-2014)
- Member, Sectional Committee (*Biochemistry and Biophysics*) of the Indian National Science Academy (2008-2011)
- Chairman, Examination Committee, Academy of Scientific and Innovative Research
- Chairman, Course Committee, Academy of Scientific and Innovative Research
- Coordinator, Kishore Vaigyanik Protsahan Yojna (KVPY) (2013, 2015)
- Member, Scientific Advisory Committee, National Institute of Biomedical Genomics, Kalyani (2010-2013)
- Member, Scientific Advisory Committee, Pharmakodyne Biosciences, Hyderabad, (2011)
- Member, Faculty Selection Committee, Indian Institute of Science, Bangalore
- Member, Faculty Review Committee, National Institute of Immunology, New Delhi (2011)
- Member, Selection Committee (Life Sciences) for the Summer Research Fellowship Program, Science Academies' Education Program (2009)
- Coordinator, Workshop on ***Molecular Interactions and Dynamics by Fluorescence Microscopy***, Centre for Cellular and Molecular Biology, Hyderabad, 25th January, 2008
- Convenor, ***8th International Symposium on Biochemical Roles of Eukaryotic Cell Surface Macromolecules***, Centre for Cellular and Molecular Biology, Hyderabad, 21-25 January, 2008
- Course Co-ordinator, Workshop on "***Advanced Microscopy and Cellular Dynamics***", Centre for Cellular and Molecular Biology (sponsored by Carl Zeiss), Hyderabad, 10-14 November, 2005
- Convenor, Satellite Symposium of XIII International Biophysics Congress on "***Membranes, Sensors and Cell Surfaces***", Centre for Cellular and Molecular Biology, Hyderabad, 15-17 September, 1999

- Member, Animal Sciences and Biotechnology grant review committee, Council of Scientific and Industrial Research (2008-2011)
- Manuscript referee for *Biochemistry*, *Biophysical Journal*, *Science Advance*, *Journal of the American Chemical Society*, *Nature Chemical Biology*, *Journal of Cell Science*, *Biochimica et Biophysica Acta (Biomembranes)*, *Biochimica et Biophysica Acta (Molecular and Cell Biology of Lipids)*, *Journal of Physical Chemistry*, *Protein Science*, *The Journal of General Physiology*, *Langmuir, FEBS Letters, Nature Chemical Biology, Analytical Biochemistry*, *Faculty of 1000 Biology Reports*, *Journal of Fluorescence*, *Molecular Membrane Biology, Neuroscience, Journal of Colloid and Interface Science, Journal of Biosciences, Acta Tropica, Indian Journal of Biochemistry & Biophysics, Current Science, PLOS Neglected Tropical Diseases, and Proceedings of the Indian Academy of Sciences*
- Vice President, the Indian Society of Cell Biology (2012-2014)
- Member, Executive Committee of the International Symposium on Biochemical Roles of Eukaryotic Cell Surface Macromolecules (2008-2011)
- Member, Executive Council of the Asian Pacific Society for Neurochemistry (2004-2006)
- Member, Executive Committee of the Indian Academy of Neurosciences (2005-2006)
- Member, Executive Committee of the Indian Biophysical Society (1999-2005)
- Member, Executive Committee of the Society for Neurochemistry, India (2003-2005, 2007-2009)
- Member, Executive Committee of the Indian Society of Cell Biology (2003-2005; 2011-2013)
- Member, Executive Committee of the Indian Photobiology Society (1999-2001)
- External observer for the Annual Research Talks of the Molecular Biology Unit, Tata Institute of Fundamental Research (1997)
- Grant proposal referee, National Science Foundation (USA), Biotechnology and Biological Sciences Research Council (UK), Molecular Research Council (UK), The Austrian Science Fund, Department of Science & Technology, Department of Biotechnology, Council of Scientific and Industrial Research, Indo-French Centre for the Promotion of Advanced Research, Indo-US Science and Technology Forum
- Member, Project Monitoring Expert Committee, Department of Biotechnology, Government of India
- Joint organizer, IX National Symposium of the Indian Photobiology Society, Centre for Cellular & Molecular Biology, Hyderabad, 4-5 March, 1994
- Ph.D. and M.Phil thesis examiner for Indian Institute of Science (Bangalore), Tata Institute of Fundamental Research (Mumbai), National Centre for Biological Sciences (Bangalore), University of Melbourne (Australia), Aarhus University (Denmark), Indian Institute of Science Education and Research (Mohali), Raman Research Institute (Bangalore), Indian Institute of Technology (Kanpur), Indian Institute of Technology (Mumbai), Indian Institute of Technology (Guwahati), Bose Institute (Kolkata), Saha Institute of Nuclear Physics (Kolkata), National Institute of Mental Health and Neuro Sciences (Bangalore), University of Hyderabad, Advance Centre for Treatment, National Institute of Science Education and Research (Bhubaneswar), Research and Education in Cancer (Mumbai), and Indian Association for the Cultivation of Science (Kolkata)
- Co-convenor, Indo-U.S. workshop on "***Membrane Structure and Function: The State of***

the Art", held at Indian Institute of Science, Bangalore, and Centre for Cellular & Molecular Biology, Hyderabad, 7-18 January, 1991

- Member, Faculty Selection Committee, School of Life Sciences, Jawaharlal Nehru University, and School of Life Sciences, University of Hyderabad
- Member, Academic Committee, JNU-CCMB Ph.D. program
- Member, Advisory Group, for preparation of CSIR 2021: Vision & Strategy
- Member, CSIR Working Group for 12th Five Year Plan Preparation
- Member, Working Group on PAN India Science and Technology Mission
- Member, Scientific Advisory Committee, National Brain Research Centre, Manesar, Haryana
- Member, Selection Committee for Faculty Recruitment, Saha Institute of Nuclear Physics, Kolkata
- Member, Scientific Advisory Committee, Apollo Stem Cell Therapy Unit, Apollo Hospitals, Hyderabad
- Member, Selection Committee for Prof. B.K. Bachhawat International Travel Grant for young scientists.
- Adviser, Agricultural Scientists Recruitment Board, Indian Council of Agricultural Research
- Member, panel of judges, Dr. K. V. Rao Scientific Society, 2002
- Member, Sub-committee on Structure and Function of Biomembranes of the Technical Advisory Board (Biological Sciences) of CSIR laboratories, 1990-1991

Professional Positions:

2021-present	CSIR Bhatnagar Fellow, Centre for Cellular & Molecular Biology, Hyderabad, India Professor and Founding Dean, Biological Sciences Academy of Scientific and Innovative Research
2018-2021	SERB Distinguished Fellow, Centre for Cellular & Molecular Biology, Hyderabad, India
2019 (May)	Visiting Professor, Paul Sabatier Universite Toulouse III and the Institut de Pharmacologie et Biologie Structurale (IPBS-UPS/CNRS), France
2016-2018	J.C. Bose Fellow, Centre for Cellular & Molecular Biology, Hyderabad, India
2016	Acting Director, Centre for Cellular & Molecular Biology, Hyderabad, India
2010-2016	Outstanding Scientist (Director Level), Centre for Cellular & Molecular Biology, Hyderabad, India

2010-2016	Dean, Biological Sciences, Academy of Scientific and Innovative Research
2014 (April)	Visiting Professor, Swinburne University, Melbourne, Australia
2004-2010	Deputy Director (Scientist F), Centre for Cellular & Molecular Biology, Hyderabad, India
2007 (March)	Dozor Visiting Professor, Ben-Gurion University of the Negev, Israel
1993-2016	Group Leader, Centre for Cellular & Molecular Biology, Hyderabad, India
1999-2004	Principal Scientist II (Scientist E II), Centre for Cellular & Molecular Biology, Hyderabad, India
2003 (October)	Visiting Professor, Department of Chemistry, University of Melbourne, Australia
2003 (November) 1999 (June)	Visiting Professor, Department of Chemistry, University of Kaiserslautern, Germany
1997 (April-June)	Visiting Faculty, Department of Biology, The Johns Hopkins University, Baltimore, U.S.A.
1994-1999	Principal Scientist I (Scientist E I), Centre for Cellular & Molecular Biology, Hyderabad, India
1992 (Sept-Dec)	Visiting Associate, Department of Biology, University of California, Santa Cruz, U.S.A.
1989-1994	Senior Scientist (Scientist C), Centre for Cellular & Molecular Biology, Hyderabad, India
1987-1989	Postdoctoral Fellow, Department of Biochemistry & Biophysics, University of California, Davis, U.S.A.

Research Experience:

Postdoctoral research with Prof. Mark G. McNamee, Department of Biochemistry & Biophysics, University of California, Davis, 1987-1989.
Topic: Structural and functional studies of the reconstituted nicotinic acetylcholine receptor from *Torpedo californica*

Doctoral thesis with Prof. Erwin London, Department of Biochemistry, SUNY at Stony Brook,

1983-1987.
Topic: New spectroscopic approaches to biological membrane structure

Graduate research with Prof. Charles S. Springer, Jr., Department of Chemistry, SUNY at Stony Brook, 1981-1983.
Topic: Activation volumes for cation transport across model membranes by high pressure ESR spectroscopy

Masters project with Prof. S. Sarkar, Department of Chemistry, Indian Institute of Technology, Kanpur, 1980.
Topic: Stereochemical complexities in some cyano complexes of unusual coordination

Publications (Total citations > 16,800, *h-index* 69, *i-10* index 249, source: Google Scholar) (*full listing and texts of papers available in pdf format at http://e-portal.ccmb.res.in/e-space/amit/Pages/Index.htm*):

(a) **Peer-reviewed Articles in Journals**: 298 (*first and/or corresponding author in most;* ***16 articles featured on the journal cover***)
(b) **Books**: 3
(c) **Articles in Books and Proceedings**: 22
(d) **Invited Book Reviews**: 2
(e) **Others**: 8 *(Guest Editor of special issues of journals and monographs)*
(f) **Popular Article**: 1
(g) **Abstracts**: 298

Patents: 1 U.S. patent granted, 1 Indian patent granted

Invited Seminars and Presentations: 646 (including Keynote/Plenary/Colloquium/ Award/Mentor Lectures)

Teaching Experience:

"*Biomembranes*" *(renamed as Self Organization in Biology*; part of a Graduate level course in Molecular and Cell Biology), Centre for Cellular & Molecular Biology, Hyderabad, 1990, 1993-1998, 2002-2021

"*Research Problem: Identification, Design/Plan and Observation*" (a Graduate level course in Molecular and Cell Biology), Centre for Cellular & Molecular Biology, Hyderabad, 2022

"*Biomembranes*" (a short 12 lecture course for advanced undergraduate and graduate students), Indian Institute of Science Education and Research, Kolkata, 2020

"*Application of Fluorescence Spectroscopy to Problems in Modern Biology*" invited lecture delivered at the UGC Refresher Course, Department of Biochemistry, Panjab University, 19th

December, 2019

"*Membrane Proteins: Excitements and Challenges*" invited lecture delivered at the UGC Refresher Course, Department of Biochemistry, Panjab University, 19th December, 2019

"*Excitements and Challenges in Biomembranes: Where Physics, Chemistry, Biology and Medicine Meet"*, invited lectures (2) delivered, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE-SUPAERO), University of Toulouse, France, 2019

"*Excitements and Challenges in Biomembranes: Where Physics, Chemistry, Biology and Medicine Meet"*, invited lectures (2) delivered, Paul Sabatier Universite Toulouse III, France, 2019

"Biomembranes" (a graduate course module), Department of Chemistry, Indian Institute of Technology Bombay, Mumbai, 2018

"*Membrane Biophysics*", (lectures as part of a Graduate level course), Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai, 2017

"*How to Write a Scientific Manuscript: Excitements, Challenges and Reality*", (part of a Graduate level course), Centre for Cellular & Molecular Biology, Hyderabad, 2016, 2017

"*Ion Channels: A Biophysical Perspective*", invited lectures delivered at the GIAN course on Ionic Signaling and Human Disease, University of Hyderabad, July, 2016

"*Cellular Membranes: Uniqueness, Excitement and Challenges*", invited lectures delivered at a Graduate level course, Indian Institute of Science Education & Research, Mohali, February, 2015

"*Fluorescence in Biology*", invited lectures delivered at a Graduate level course, Indian Institute of Technology, Kanpur, November, 2014

"*Fluorescence in Biology: From Solvent Relaxation to Drug Discovery*", invited lectures delivered at a Graduate level course, Indian Institute of Science Education & Research, Mohali, October, 2011

Designed graduate level courses, curricula and examinations for the Academy of Scientific and Innovative Research (AcSIR) as Dean, Biological Sciences (2011)

"*Biomembranes: Organization, Dynamics and Function*", invited lectures (graduate level mini course: total 6 lectures) delivered, Institute of Life Sciences, Hyderabad, August, 2011

"*Fluorescence in Biology*", invited lectures delivered at a Graduate level course, Indian Institute of Science Education & Research, Mohali, October, 2010

"*Fluorescence and its Application in Biology*", invited lectures delivered at a Graduate level course, Indian Institute of Science Education & Research, Mohali, March, 2010

"*Molecular Spectroscopy: Fluorescence in Biology*", invited lectures delivered at the Refresher Course on Advances in Biophysics, Centre for Cellular and Molecular Biology, 2007

"*Biomembranes*" a Graduate level course at the Department of Chemistry, Ben-Gurion University at the Negev, Israel, 2007

"*Biological Membranes: What is Unique about Them ?*" invited special lectures at the Department of Biotechnology, West Bengal University of Technology, 2006

"*Biomembranes: What is Unique about Them ?*", Summer Science and Research Awareness Series, SUNY Medical Center, Stony Brook, New York, 2005

"*Biophysics of Lipids: Application of Fluorescence Approaches to Membrane Biology*", guest lectures delivered at the Graduate Course on *Biophysical Methods in Life Sciences*, National University of Singapore, 2005

"*Biomembranes: What is Unique about Them ?*" invited lecture delivered at the UGC Refresher Course in Life Science, University of Kerala, Trivandrum, 2005

"*Approaches to Monitor Membrane Dynamics*" invited lecture delivered at the UGC Refresher Course on *Chemistry of Biomolecules*, Department of Chemistry, University of Hyderabad, 2005

"*Biomembranes: What is Unique about Them ?*" invited lecture delivered at the UGC Refresher Course on *Chemistry of Biomolecules*, Department of Chemistry, University of Hyderabad, 2005

"*Biomembranes*" invited lectures delivered at a Graduate level course in Bioinformatics Program, International Institute of Information Technology, Hyderabad, 2005

"*Application of Fluorescence in Membrane Biology*" a Graduate level course in Graduate Research School, University of Kaiserslautern, Germany, 2003

"*Application of Fluorescence Spectroscopy to Problems in Modern Biology*" invited lectures delivered at the UGC Refresher Course, Department of Physics, Kumaun University, Nainital, 2003

"*Biomembrane Structure and Dynamics*" invited lectures delivered at the Mahabaleshwar Seminar 2002 in Modern Biology on "*Cellular Traffic*", Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai, 2003

"*Fluorescence in Biology*" (part of a Graduate level course in Molecular and Cell Biology), Centre for Cellular & Molecular Biology, Hyderabad, 2001

"*Membrane Organization and Dynamics*", lectures delivered as part of a Graduate level course, School of Life Sciences, Jawaharlal Nehru University, New Delhi, 2001

"*Membrane Dynamics*" (part of a Graduate level course in Molecular and Cell Biology), Centre for Cellular & Molecular Biology, Hyderabad, 2000

"*Membrane Structure and Function*" (a Graduate level course in Biotechnology Graduate Group), Department of Chemistry, University of Kaiserslautern, Germany, 1999

"*Cell Membranes*" (part of a Graduate level course in Cell Biology), Centre for Cellular & Molecular Biology, Hyderabad, 1997, 1999

"*Fluorescence in Biophysics*" workshop conducted at the National Symposium on Cellular and Molecular Biophysics, organized by the Indian Biophysical Society, at the Centre for Cellular and Molecular Biology, Hyderabad, 1995

"*Membrane Proteins*" (part of a Graduate level course in Molecular Biology), Centre for Cellular & Molecular Biology, Hyderabad, 1991

"*Undergraduate Seminar in Biochemistry*", University of California, Davis, Spring 1988 and Spring 1989

Teaching Assistant, General Chemistry, SUNY at Stony Brook, 1980-1983

Coordinator of the General Chemistry study groups organized by the Learning Skills Center, SUNY at Stony Brook, 1981-1983

Coordinator of the General Chemistry tutorial sessions organized by the Counselling Service, Indian Institute of Technology, Kanpur, 1979

Research Personnel Mentored:

(a) *Ph.D. Student*: 19 (Ph.D. completed; *two students were awarded INSA Young Scientist Medal for Ph.D. thesis; one student awarded Sun Pharma Science Scholar Award-2018 and NASI Young Scientist Platinum Jubilee award-2021 in Biomedical Sciences for Ph.D. work*), 3 (current Ph.D. students)
(b) *Staff Technician/Technical Officer*: 4
(c) *Senior Research Associate*: 1
(d) *Visiting Scientist*: 2
(e) *Postdoctoral Fellow*: 19
(f) *Project Assistant*: 15
(g) *Guest Student Worker*: 1
(h) *M.Sc. Project Student*: 6
(i) *Summer Student*: 31

Society Memberships:

American Association for the Advancement of Science
Biophysical Society, U.S.A.
American Chemical Society
International Society for Neurochemistry
British Biophysical Society
Society of Biological Chemists, India (Life Member)
Indian Society of Cell Biology (Life Member)
Indian Biophysical Society (Life Member)
Indian Photobiology Society (Life Member)
Indian Academy of Neurosciences (Life Member)
Society for Neurochemistry, India (Life Member)
Indian Peptide Society (Life Member)
ARC/NHMRC Network for Fluorescence Applications in Biotechnology and Life Sciences
Association of British Scholars, Hyderabad Chapter (Life Member)
Chemical Research Society of India (Life Member)
Indian Science Congress Association (Life Member)
Indian Society for Radiation and Photochemical Sciences (Life Member)
Fluorescence Society (Life Member)
Chemical Biology Society (Life Member)

Research Interests:

- Membrane structure, function and dynamics
- Application of spectroscopic techniques to biological problems
- Organization and dynamics of molecular assemblies such as micelles and reverse micelles
- Membrane hydration with special reference to the interface
- Fluorescence probes for membrane structure and dynamics
- Organization, dynamics, and function of ion carriers and ion channels
- Lipid-protein interactions in membranes and its relevance in health and disease
- Membrane domains especially in neuronal membranes
- Transbilayer organization of membrane cholesterol
- Localization, photophysics and function of membrane-bound tryptophans
- Organization, dynamics, and function of membrane lytic peptides
- Solvent relaxation dynamics in membranes and proteins
- Fluorescence microscopy
- Fluorescence recovery after photobleaching (FRAP)
- Fluorescence Correlation Spectroscopy (FCS)
- Membrane receptor dynamics and signaling: testing the 'mobile receptor hypothesis'
- Interactions of anesthetics and alcohols with membrane lipids and receptors
- Membrane organization, dynamics and function of the serotonin$_{1A}$ receptor: interaction with membrane lipids
- Interaction of the serotonin$_{1A}$ receptor with membrane sterols: cholesterol modulation in neuronal membranes and its relevance in health and disease
- Application of fluorescence in studying receptor-ligand interactions
- Role of membrane lipids in the entry of pathogens into host cells

- Pathogenicity involving defective cholesterol biosynthesis
- Effect of cholesterol and its evolutionary precursors on the structure and function of membranes

Major Scientific Achievements:

- First comprehensive demonstration of the ***role of cholesterol*** in maintaining the function of G protein-coupled receptors (Pucadyil & Chattopadhyay (2004) ***Biochim. Biophys. Acta (Biomembranes)*** 1663: 188-200; reviewed in Pucadyil & Chattopadhyay (2006) ***Prog. Lipid Res.*** 45: 295-333, Paila & Chattopadhyay (2010) ***Subcell. Biochem.*** 51: 439-466, Jafurulla and Chattopadhyay (2013) ***Curr. Med. Chem.*** 20: 47-55, Sengupta and Chattopadhyay (2015) ***Biochim. Biophys. Acta (Biomembranes)*** 1848: 1775-1782, Sengupta *et al.* (2019) ***J. Phys. Chem. B*** 122: 5727-5737). This discovery had a huge impact in the field and within a few years results from our and other groups showed that membrane cholesterol has crucial implications in GPCR function, oligonerzation and endocytosis. This was accompanied by advances in GPCR strucrutal biology resulting in bound cholesterol molecules in GPCR structures. Subsequently, this has become a hot field in contemporary GPCR biology.

- First demonstration of change in endocytic pathway and intracellular trafficking pattern of a G protein-coupled receptor upon chronic cholesterol depletion by statin (Kumar & Chattopadhyay (2020) ***ACS Chem. Neurosci.*** 11: 453-4659)

- First report of CRAC motifs in G-protein coupled receptors ((Jafurulla *et al.* (2011) ***Biochem. Biophys. Res. Commun.*** 404: 569-573). The discovery of CRAC motifs, indicative of cholesterol inreraction sites, had major impact in the area of GPCR-cholesterol interaction.

- First demonstration of membrane cholesterol sensitivity of *taste receptor function* (in collaboration with Prof. Prashen Chelikani's group) (Pydi et al. (2016) ***Biochim. Biophys. Acta (Biomembranes)*** 1858: 2081-2087)

- First demonstration of the *role of sphingolipids* in maintaining the function of G protein-coupled receptors (Jafurulla *et al*. (2008) ***Biochim. Biophys. Act (Biomembranes)*** 1778: 2022-2025, Paila *et al*. (2010) ***Biochemistry*** 49: 2389-2397, Singh *et al.* (2012) ***J. Neurochem.*** 123: 716-724)

- First report of an assay capable of quantitatively estimating the changes in the actin cytoskeleton upon GPCR activation by quantitatively estimating F-actin in cells by high magnification imaginging, followed by image reconstruction (Ganguly et al. (2011) ***Biochim. Biophys. Acta (Biomembranes)*** 1808: 1921–1929)

- Pioneered the development and application of ***wavelength-selective fluorescence*** as a novel approach to monitor organization and dynamics of probes and proteins in organized molecular assemblies such as biomembranes, micelles, and reverse micelles (Chattopadhyay & Mukherjee (1993) ***Biochemistry*** 32: 3804-3811; comprehensively reviewed in Haldar *et*

al. (2011) ***J. Phys. Chem. B*** 115: 5693-5706, Haldar & Chattopadhyay (2014) ***Acc. Chem. Res.*** 47: 12-19). A unique feature of this approach is its ability to monitor dynamics of membrane-associated water molecules. Important applications include monitoring the environment of the functionally important tryptophans in the ion channel gramicidin (Mukherjee & Chattopadhyay (1994) ***Biochemistry*** 33: 5089-5097; Rawat *et al.* (2004) ***Biophys. J.*** 87: 831-843) and in the lytic peptide melittin (Ghosh *et al.* (1997) ***Biochemistry*** 36: 14291-14305; Raghuraman & Chattopadhyay (2004) ***Biophys. J.*** 87: 2419-243; Raghuraman & Chattopadhyay (2007) ***Biophys. J.*** 92: 1271-1283). Interesting applications include probing defined depths in the membrane utilizing depth-dependent solvent relaxation as a *membrane dipstick* (Chattopadhyay & Mukherjee (1999) ***Langmuir*** 15: 2142-2148) and fluorophore dynamics in the Green Fluorescent Protein (GFP) (Haldar & Chattopadhyay (2007) ***J. Phys. Chem. B*** 111: 14436-14439).

- First experimental demonstration on the modulation of dielectric relaxation response of membrane interfacial water by membrane lipid composition in a concentration-dependent manner using Terahertz spectroscopy (in collaboration wth Prof. Rajib Mitra's group) (Pal *et al*. (2018) ***J. Phys. Chem. B*** 122: 5066-5074). This work represents *one of the early applications* of time-resolved Terahertz spectroscopy in membranes.

- Development and application of a novel approach (now widely known as the '***Parallax***' method), suitable for determining depths of a wide variety of membrane-bound probes and proteins. This method enjoys considerable popularity in contemporary membrane biology for localization of membrane-bound molecules and the paper describing this approach (Chattopadhyay & London (1987) ***Biochemistry*** 26: 39-45) enjoys a citation of ~700.

- First identification of the route of phagocytosis of *Leishmania donovani* into host cells utilizing caveolin-mediated endocytosis (Kumar *et al*. (2019) ***Sci. Rep.*** 9: 12636)

- First measurement of rotational dynamics in Golgi membranes (in collaboration with Prof. Andrew Claytons's group) (Lajevardipour *et al.* (2016) ***Sci. Rep.*** 6: 37038)

- First demonstration of the impairment of signaling by the serotonin$_{1A}$ receptor under conditions **mimicking the Smith-Lemli-Opitz syndrome** (Paila *et al*. (2008) ***Biochim. Biophys. Acta (Biomembranes)*** 1778: 1508-1516).

- First demonstration of the ***change in dynamics of a G-protein coupled receptor, the serotonin$_{1A}$ receptor, upon G-protein activation,*** using Fluorescence Recovery After Photobleaching (**FRAP**) approach (Pucadyil *et al.* (2004) ***Biochemistry*** 43: 15852-15862. Importantly, the *correlation between signaling and dynamics* was demonstrated for this receptor (Ganguly *et al*. (2008) ***Biophys. J.*** 95: 451-463)

- First report of ***residual structure*** in proteins in ***denatured*** state shown by the wavelength-selective fluorescence approach (Chattopadhyay *et al.* (2003) ***Protein Sci.*** 12: 2389-2403)

- Demonstration of novel cholesterol domains containing ***transbilayer cholesterol dimers*** in membranes of low cholesterol content such as the endoplasmic reticulum and the inner

mitochondrial membrane (Mukherjee & Chattopadhyay (1996) ***Biochemistry*** 35: 1311-1322). These domains, proposed to be inportant for signal transduction, were shown to be modulated by membrane curvature and thickness (Rukmini *et al.* (2001) ***Biophys. J.*** 81: 2122-2134)

- First comprehensive demonstration of the ***intrinsic fluorescence of serotonin***, a neurotransmitter in the central nervous system (Chattopadhyay *et al.* (1996) ***Biophys. J.*** 71: 1952-1960)

- Novel demonstration of ionic strength dependence of the critical micelle concentration of the zwitterionic detergent CHAPS (Chattopadhyay & Harikumar (1996) ***FEBS Lett.*** 391: 199-202), resulting in *functional solubilization* of a membrane-bound neuronal receptor (serotonin$_{1A}$ receptor) using 'pre-micellar' concentration of CHAPS (Chattopadhyay *et al.* (2002) ***Mol. Membr. Biol.*** 19: 211-220)

- First demonstration of ***reduction in leishmanial infection*** upon ***cholesterol depletion*** in host macrophage plasma membranes (in collabotration with Prof. R. Madhubala's group) (Pucadyil *et al.* (2004) ***Mol. Biochem. Parasitol.*** 133: 145-152). This concept has been patented (U.S. patent # 7186702; Indian patent # 242180) with the long-term goal of developing novel therapeutic strategies to tackle leishmaniasis

- First demonstration of an optimum host plasma membrane cholesterol requirement for the entry of mycobacteria into host cells (in collaboration with Dr. Raghunand Tirumalai's group (Viswanathan *et al*. (2015) ***Chem. Phys. Lipids*** 189: 19-27)

- Correlation of ***lipid dynamics*** in the ***pathogenic yeast Candida albicans*** with ***drug resistance***. (in collaboration with Prof. Rajendra Prasad's group) (Mukhopadhyay *et al*. (2004) ***Antimicrob. Agents Chemother.*** 48: 1778-1787). This represents *the first report of analysis of lipid dynamics in Candida albicans using Fluorescence Recovery After Photobleaching (FRAP) approach*.

- First application of the ***wavelength-selective FRAP*** approach to resolve diffusion parameters of individual components in a mixture of two membrane-bound diffusing species (Pucadyil *et al*. (2007) ***J. Phys. Chem. B*** 111: 1975-1983)

- Reevaluation of the mechanism of amphotericin B, the best existing drug against visceral leishmaniasis[1] (Chattopadhyay & Jafurulla (2011) ***Biochem. Biophys. Res. Commun.*** 416: 7-12)

- First application of z-scanning Fluorescence Correlation Spectroscopy (zFCS) in the cellular environment (Ganguly & Chattopadhyay (2010) ***Biophys. J.*** 99: 1397-1407)

- First comprehensive report of nonannular lipid site in G-protein coupled receptors (Paila *et al*. (2009) ***Biochim. Biophys. Acta (Biomembranes)*** 1788: 295-302)

- First demonstration of constitutive oligomers and higher order oligomers of GPCRs (the

serotonin$_{1A}$ receptor) in cells (in collaboration with Prof. Andrew Clayton's group) (Ganguly et al. (2011) ***Biophys. J.*** 100: 361-368)

- First demonstration of looping up of nitrobenzoxadiazol (**NBD**) probes when attached to the fatty acyl chains of phospholipids (Chattopadhyay and London (1988) ***Biochim. Biophys. Acta (Biomembranes)*** 938: 24-34). Since NBD probes are widely used in cell biological, biochemical and biophysical work, many groups have found this information about the orientation of the NBD group in membranes to be very useful.

- Development of a sensitive and widely applicable fluorimetric assay using diphenylhexatriene (DPH) as a probe to determine critical micelle concentrations (CMC) of detergents (Chattopadhyay and London (1984) ***Anal. Biochem.*** 139: 408-412). *This assay is applicable to all types of detergents*, irrespective of their charge. The paper[1] describing this assay enjoys a citation of ~420.

Grant Support:

"*Serotonin Receptor Type 1A: Purification, Characterization, and Lipid-Protein Interactions*", Department of Biotechnology, Government of India, 1994-1997

"*Monitoring Microenvironments in Membrane-Bound Peptides by Novel Fluorescence Approach*", Department of Science and Technology, Government of India, 1995-1998

"*Serotonin Type 1A* (*5-HT$_{1A}$ receptor) Receptors as Drug Targets: Expression of 5-HT$_{1A}$ Receptor in Membrane-Altered Strains of Yeast to Monitor the Role of Lipids in the Receptor Function*" (in collaboration with Dr. Anand K. Bachhawat of the Institute of Microbial Technology, Chandigarh). This constituted a part of the CSIR Inter-Laboratory Coordinated Program on Bioactive Molecules, 1998-2003

"*Interaction of A Cytoskeletal Protein with Membranes*", The Third World Academy of Sciences, 2001-2003

"*New Applications of Flow Cytometry and Cell Sorting in Areas of Biotechnology*", Department of Biotechnology, Government of India (joint grant proposal with six other investigators), 2002-2007

"*Fluorescence and NMR Studies of Membrane Peptides and Proteins*", International Collaborative Research Grant, The University of Melbourne, Australia, 2002-2003

"*Organization of the Serotonin$_{1A}$ Receptor in the Membrane Environment: Exploring Detergent Insolubility of Serotonin$_{1A}$ Receptors at the Cell Surface*", Life Sciences Research Board, Government of India, 2005-2008

"*Exploring the Membrane Organization of the Serotonin-1A Receptor in Living Cells by Fluorescence Lifetime Imaging Microscopy (FLIM) and Fluorescence Resonance Energy*

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"*Nanomaterials and Nanodevices*", CSIR Network project, 2007-2012

"*Dynamics of Serotonin$_{1A}$ Receptors by Single Particle Tracking*", Indo-French Centre for the Promotion of Advanced Research (IFCPAR), 2011-2014

"*Neurodegenerative Diseases: Causes and Corrections*", CSIR Network project, 2012-2017

"*Host Interactome Analysis: Understanding the Role of Host Molecules in Parasitic Infection*", CSIR Network project, 2012-2017

"*Nano-materials: Applications and Impact on Safety, Health and Environment*", CSIR Network project, 2012-2017

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"*Role of Membrane Lipids on GPCR Organization: A Combined Experimental and Simulation Approach*", Science and Engineering Research Board, Department of Science and Technology, Government of India, 2017-2020

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"GPCR Endocytosis in Health and Disease", CSIR Focused Basic Research (FBR) project, 2020-2023

"*Investigating Interactions at the Host-Pathogen Interface in the Pathogenesis of Mycobacterium tuberculosis*", CSIR FBR project, 2020-2025 (jointly with Dr. Raghunand Tirumalai)

"*Molecular Insights into Ligand-selective and Cholesterol-specific Activation of the GPCR Serotonin$_{1A}$ Receptor with GPU-enabled High-performance Computing*", Science and Engineering Research Board, Department of Science and Technology, Government of India, 2021-2024 (jointly with Dr. Sandipan Chakraborty)

"Endocytosis and Trafficking of GPCRs under Conditions of Hypoxia and Senescence: Role of Membrane Cholesterol and Actin Cytoskeleton", CSIR Focused Basic Research (FBR) project, 2024-2025 (submitted)

Structural Insights into Ligand-selective Oligomeric Organization Landscape of the Serotonin$_{1A}$ Receptor using Exascale GPU-enabled High Performance Computing (jointly with Dr. Sandipan Chakraborty, submitted)

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