

## **Sandipan Ray M.Sc., Ph.D., MRSB**

### **Assistant Professor and Group Leader**

Circadian Rhythms and Disease Biology Laboratory

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Date of Birth: 5<sup>th</sup> January 1987

Nationality: Indian

## **EDUCATION**

- **Doctor of Philosophy (Ph. D.) – Biosciences** [Proteomics and infectious diseases] (2009-2014)
  - Institute: Department of Biosciences and Bioengineering, Indian Institute of Technology (IIT) Bombay, Mumbai, India
  - Date of Ph.D. defense: 18<sup>th</sup> November, 2014
  - Received the “Excellence in Ph.D. Research” award
- **Master of Science (M. Sc.) – Biotechnology** (2007-2009)
  - Institute: Dr. Guha Centre for Genetic Engineering and Biotechnology (GCGB), University of Calcutta, Kolkata, India
  - Obtained First class – Second rank
- **Bachelor of Science (B. Sc., Hons.) – Microbiology** (2004-2007)
  - Institute: University of Calcutta, Kolkata, India
  - Obtained First class – First rank

## **RESEARCH EXPERIENCE**

- Nov 2020 – **Assistant Professor and Group Leader - Department of Biotechnology, Indian Institute of Technology Hyderabad, India**  
Present  
Research area: Circadian clocks and sleep, Host and parasite circadian rhythms in infectious diseases, Mechanism of pharmacological modulators of circadian clocks, Systems biology, Clinical proteomics and mass spectrometry
- Dec 2018 – **Senior Postdoctoral Fellow - Perelman School of Medicine, University of Pennsylvania, USA**  
Oct 2020  
Research topic: Non-canonical circadian rhythms in the absence of the core clock genes
- Dec 2016 – **Research Associate - Institute of Neurology, University College London, UK**  
Dec 2018  
Research topic: Quantitative proteomics to study mechanisms of action and cellular targets for circadian clock-modulating compounds
- Dec 2016 – **Visiting Scientist - The Francis Crick Institute, UK**

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|--------------------------|---|
| Dec 2018                 | Research topic: Multiplexed quantitative mass spectrometry to understand the underlying mechanisms of circadian rhythmicity and sleep-wake cycles   |
| Dec 2016-<br>April 2017  | <b>Visiting Scientist - University of Cambridge, UK</b><br>Research topic: Systems biology approaches to understand the cross-talk among circadian clocks, sleep wake cycles, and metabolic networks  |
| Feb 2015 -<br>Dec 2016   | <b>Postdoctoral Research Associate - University of Cambridge, UK</b><br>Research topic: Systems biology approaches to understand the cross-talk among circadian clocks, sleep wake cycles, and metabolic networks                                     |
| June - Dec<br>2014       | <b>Research Associate - IIT Bombay, India</b><br>Research topic: Proteomics and metabolomics analysis of <i>Plasmodium vivax</i> induced alterations in humans from different endemic regions of India  |
| July 2009 -<br>June 2014 | <b>Doctoral Research Fellow (Ph.D. Student) - IIT Bombay, India</b><br>Research topic: Proteomics analysis of serum in vivax and falciparum malaria patients to investigate pathogenesis and identify surrogate protein markers of infection          |
| May - July<br>2008       | <b>Summer Research Fellow - Centre for Cellular and Molecular Biology, India</b><br>Research topic: Characterization of the genes of recFOR and recBCD DNA repair pathways in the Antarctic psychrotrophic bacterium <i>Pseudomonas syringae</i> Lz4W |

## RESEARCH INTERESTS

Circadian clocks and sleep  
Neuropharmacology

Infectious diseases  
Systems biology

Neurological and metabolic disorders  
Clinical proteomics and mass spectrometry

## FELLOWSHIPS AND AWARDS (SELECTED)

- 2020: **Elected to the Royal Society of Biology, UK**
- 2018: **Postdoctoral Research Fellowship** (2 years) - University of Pennsylvania, USA
- 2018: **Thermo Scientific Annual Tandem Mass Tag Research Award** (Research grant award - USD 7500)
- 2015: **Postdoctoral Research Fellowship** (3 years) - University of Cambridge, UK
- 2015: **Excellence in Ph.D. Research Award 2014-2015** - IIT Bombay, Mumbai, India
- 2015: **Industrial Research and Consultancy Centre (IRCC) - IIT Bombay Best Review Paper Award** for the Year 2014-2015
- 2012: **Congress Student Travel Stipend Award** - Human Proteome Organization (HUPO) 11<sup>th</sup> Annual World Congress, Boston, USA
- 2012: **International Travel Support Award** - Science and Engineering Research Board, Department of Science & Technology (DST), Government of India
- 2012: **Student Travel Support Award** - US Human Proteome Organization (US HUPO) 8<sup>th</sup> Annual Conference, San Francisco, USA
- 2012: **Best Oral Presentation Award** - In-House Symposium, Dept. of Biosciences and Bioengineering, IIT Bombay, Mumbai, India
- 2009: **Doctoral (Ph.D.) Research Fellowship** (5 years) - IIT Bombay, Mumbai, India
- 2009: **CSIR-UGC Eligibility for Lectureship** (All India Rank-71)

- 2009: **Graduate Aptitude Test in Engineering (GATE)** qualification- [98.56 percentile (All India Rank-186)]
- 2008: **Summer Training Project fellowship** - Centre for Cellular and Molecular Biology, Hyderabad, India

## ACADEMIC ACTIVITIES AND OUTREACH

- Invited resource person in the Proteomics Advanced Winter School (PAWS)-2021 organized by IIT Bombay and Department of Science & Technology (DST) – Nov 2021
- Instructor in the Continuing Education Program on Proteomics organized by IIT Bombay – Nov 2021
- Participated in the UK-India Programme on Precision Medicine as a delegate from the UK (organized by the UK Science & Innovation Network, GOV.UK) – Nov 2017
- Served as a course instructor for the “Gel-based Proteomics” workshop organized during 6<sup>th</sup> Annual Meeting of Proteomics Society, India (PSI) - Dec 2014
- Served as an organizing committee member of the 6<sup>th</sup> Annual Meeting of Proteomics Society, India (PSI) and International Conference on "Proteomics from Discovery to Function" - Dec 2014
- Served as an organizing committee member of an Indo-US bilateral workshop entitled "Proteomics for Translational Research" supported by Indo-US Science & Technology Forum (IUSSTF) - Dec 2014
- Served as a Teaching Assistant for (i) Genetic Engineering and (ii) Molecular biophysics courses at IIT Bombay (2009-2010; During Ph.D. Program)
- Served as a PhD intermediate at IIT Bombay for the dissertation/project work of eight undergraduate and post-graduate students and was involved in their day-to-day supervision
- Actively involved in the development of various e-Learning & Open-Learning curriculums and Virtual Lab initiatives -
  - “Sakshat” Virtual Biotechnology Engineering Labs: <http://www.vlab.co.in/>
  - Technology Enhanced Learning (NPTEL): <http://nptel.iitm.ac.in/>
  - Open-Source Courseware Animations Repository (OSCAR): <http://oscar.iitb.ac.in/oscarHome.do>
- Conducted hands-on trainings and crash-courses on proteomics at IIT Bombay and many other institutes including the Continuing Education Programme (CEP), IIT Bombay workshops

## PUBLICATIONS

**ORCID ID: 0000-0002-9960-5768**

**Scopus Author Identifier: 35975419900**

**Total Citation: 1778; h-index = 23; i10-index = 38 (Source – Google Scholar)**

**\* Equal contribution; † Corresponding author**

### **A. Journal Publications [47]**

## 2019-2021

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1. Puppala A, Rankawat S, **Ray S**<sup>ψ</sup>. Circadian Timekeeping in Anticancer Therapeutics: An Emerging Vista of Chronopharmacology Research. *Curr Drug Metab.* 2021, 22, 998-1008.
2. Rando HM, MacLean AL, Lee AJ, Lordan R, **Ray S**, et al., Pathogenesis, Symptomatology, and Transmission of SARS-CoV-2 through analysis of Viral Genomics and Structure. *mSystems* 2021, 6 (5), e00095-21.
3. Lordan R, Rando HM, ..., **Ray S** (as a part of COVID-19 Review Consortium) Casey S Greene. Dietary Supplements and Nutraceuticals under Investigation for COVID-19 Prevention and Treatment. *mSystems* 2021, 6 (3), e00122-21.
4. Rando HM, Wellhausen W, Ghosh S, ....., **Ray S**. (as a part of COVID-19 Review Consortium) Casey S Greene. Identification and Development of Therapeutics for COVID-19. *mSystems*. 2021, 6(6), e0023321.
5. Ch R, Rey G, **Ray S**, Jha P, et al., Rhythmic glucose metabolism regulates the redox circadian clockwork in human red blood cells. *Nat Commun.* 2021, 12, 377.
6. Rajarshi K, Khan R, Singh MK, Ranjan T, **Ray S**<sup>ψ</sup>, Ray S. Essential functional molecules associated with SARS-CoV-2 infection: Potential therapeutic targets for COVID-19. *Gene.* 2021, 768,145313.
7. **Ray S**<sup>ψ</sup>, Reddy AB. COVID-19 management in light of the circadian clock. *Nat Rev Mol Cell Biol.* 2020, 21(9), 494-495.
8. Kumar V, **Ray S**, Aggarwal S, Biswas D, et al., Multiplexed quantitative proteomics provides mechanistic cues for malaria severity and complexity. *Commun Biol. Nature* 2020, 3(1), 683.
9. **Ray S**<sup>ψ</sup>, Srivastava S. Virtualization of Science Education: A Lesson from the COVID-19 Pandemic. *J Proteins Proteom.* 2020, 11, 77-80.
10. **Ray S**, Srivastava S. COVID-19 Pandemic: Hopes from Proteomics and Multi-Omics Research. *OMICS* 2020. 24(8), 457-459.
11. Kumar V, **Ray S**, Ghantasala S, Srivastava S. An integrated quantitative proteomics workflow for cancer biomarker discovery and validation in plasma. *Front Oncol.* 2020,10, 543997.
12. **Ray S**, Valekunja UK, Stangherlin A, Howell SA, et al., Circadian rhythms in the absence of the clock gene *Bmal1*. *Science.* 2020, 367(6479), 800-806 [Featured in *Science.* 2020, 367(6479), 740-741].
13. **Ray S**<sup>ψ</sup>, Lach R, Heesom KJ, Valekunja UK, et al., Phenotypic proteomic profiling identifies a landscape of targets for circadian clock-modulating compounds. *Life Sci Alliance.* 2019, 2(6), e201900603.

## 2016-2018

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14. Rey G, Milev NB, Valekunja UK, Ch R, **Ray S**, et al., Metabolic oscillations on the circadian time scale in *Drosophila* cells lacking clock genes. *Mol Syst Biol.* 2018, 14(8), e8376 [Featured on journal cover page, and in *Mol Syst Biol.* 2018,14(9), e8567].
15. **Ray S**, Patel SK, Venkatesh A, Chatterjee G, et al., Quantitative proteomics analysis of plasmodium vivax induced alterations in human serum during the acute and convalescent phases of infection. *Nature Sci Rep.* 2017, 7(1), 4400.

16. **Ray S**, Patel SK, Venkatesh A, Bhawe A, et al., Clinicopathological analysis and multipronged quantitative proteomics reveal oxidative stress and cytoskeletal proteins as possible markers for severe vivax malaria. *Nature Sci Rep.* 2016, 6, 24557.
17. **Ray S**, Reddy AB. Cross-talk between circadian clocks, sleep-wake cycles, and metabolic networks: Dispelling the darkness. *Bioessays.* 2016, 38(4), 394-405.
18. Venkatesh A, Patel SK, **Ray S**, Chatterjee G, et al., Proteomics of *Plasmodium vivax* malaria: progress and potential. *Expert Rev Proteomics.* 2016, 13(8), 771-782.

## 2013-2015

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19. Shah V, **Ray S**, Srivastava S. Calibration-free concentration analysis of protein biomarkers in human serum using surface plasmon resonance. *Talanta* 2015, 144, 801-808.
20. **Ray S**, Kumar V, Bhawe A, Singh V, et al., Proteomic analysis of *Plasmodium falciparum* induced alterations in humans from different endemic regions of India to decipher malaria pathogenesis and identify surrogate markers of severity. *J Proteomics.* 2015, 127(Pt A):103-13.
21. Reddy JP, Sinha S, **Ray S**, Sathe GJ, et al., Comprehensive analysis of temporal alterations in cellular proteome of *Bacillus subtilis* under curcumin treatment. *PLoS One.* 2015, 10(4), e0120620.
22. Reddy JP, **Ray S**, Sathe GJ, Gajbhiye A, et al., Comprehensive proteomic analysis of totarol induced alterations in *Bacillus subtilis* by multipronged quantitative proteomics. *J Proteomics.* 2015, 114, 247-262.
23. Sharma S, **Ray S**, Mukherjee S, Moiyadi A, Sridhar E, Srivastava S. Multipronged quantitative proteomic analyses indicate modulation of various signal transduction pathways in human meningiomas. *Proteomics.* 2015, 15(2-3), 394-407.
24. Reddy JP, **Ray S**, Sathe GJ, Keshava Prasad TS, et al., Proteomics analyses of *Bacillus subtilis* after treatment with plumbagin, a plant-derived naphthoquinone. *OMICS.* 2015, 19(1), 12-23.
25. Gahoi N, **Ray S**, Srivastava S. Array-based proteomic approaches to study signal transduction pathways: prospects, merits and challenges. *Proteomics.* 2015, 15(2-3), 218-231.
26. Reddy PJ\*, **Ray S\***, Srivastava S. The quest of the human proteome and the missing proteins: digging deeper. *OMICS* 2015, 19(5), 276-282.
27. **Ray S**, Bhawe A, Srivastava S. Brainstorming the new avenues for translational proteomics research: first Indo-US bilateral proteomics workshop. *Current Proteomics* 2015, 12, 75-79.
28. Gupta S\*, Reddy JP\*, **Ray S\***, Atak A, et al., Meeting Report: "Proteomics from Discovery to Function:" 6th Annual Meeting of Proteomics Society, India and International Conference-A Milestone for the Indian Proteomics Community. *OMICS* 2015, 19(6): 329-331.
29. Gupta S\*, Venkatesh A\*, **Ray S\***, Srivastava S. Challenges and prospects for biomarker research: a current perspective from biomarker research. *Biochim Biophys Acta.* 2014, 1844(5), 899-908.
30. **Ray S**, Patel S, Kumar V, Damahe J. Srivastava S. Differential expression of serum/plasma proteins in various infectious diseases: overlapping and inimitable signatures. *Proteomics Clin. Appl.* 2014, 8, 53-72.
31. Sharma S, **Ray S\***, Moiyadi A, Sridhar E, Srivastava S. Quantitative proteomic analysis of meningiomas for the identification of surrogate protein markers. *Nature Sci Rep.* 2014, 4, 7140.
32. **Ray S**, Moiyadi A, Srivastava S. Biorepositories for cancer research in developing countries. *Nat Rev Clin Oncol.* 2013, 10, 434-436.

33. Srivastava S, Özdemir V, **Ray S**, et al., E-learning booster in developing world. *Nature* 2013, 501(7467), 316.

## 2010-2012

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34. **Ray S**, Renu D, Srivastava R, Gollapalli K, et al., Proteomic investigation of *falciparum* and *vivax* malaria for identification of surrogate protein markers. *PLoS One* 2012, 7(8), e41751.
35. **Ray S**, Srivastava R, Tripathi K, Vaibhav V, Patankar S, Srivastava S. Serum proteome changes in dengue virus infected patients from a dengue endemic area of India: Towards new molecular targets? *OMICS* 2012, 16(10), 527-536.
36. **Ray S**, Kamath KS, Srivastava R, Raghu D, et al., Serum proteome analysis of vivax malaria: An insight into the disease pathogenesis and host immune response. *J Proteomics*. 2012, 75, 3063-3080.
37. Srivastava R\*, **Ray S\***, Vaibhav V, Gollapalli K, et al., Serum profiling of leptospirosis patients to investigate proteomic alterations. *J Proteomics*. 2012, 76, 56-68.
38. Gollapalli K, **Ray S**, Srivastava R, Renu D, et al., Investigation of serum proteome alterations in human glioblastoma multiforme. *Proteomics* 2012, 12(14), 2378-2390.
39. **Ray S**, Koshy NR, Diwakar S, Nair B, Srivastava S. Sakshat Labs: India's virtual proteomics initiative. *PLoS Biol.* 2012, 10(7): e1001353.
40. **Ray S**, Koshy NR, Reddy PJ, Srivastava S. Virtual Labs in Proteomics: New E-Learning Tools. *J Proteomics*. 2012, 75, 2515-2525.
41. Reddy PJ, Sadhu S, **Ray S**, Srivastava S. Cancer biomarker detection by surface plasmon resonance biosensors. *Clin Lab Med.* 2012, 32(1), 47-72.
42. **Ray S**, Reddy PJ, Choudhary S, Raghu D, Srivastava S. Emerging nanoproteomics approaches for disease biomarker detection: A current perspective. *J Proteomics*. 2011, 74, 2660-2681.
43. Kamal SM, Warnich L, Ferguson LR, Srivastava S, **Ray S**, et al., Forward Look: Tenth Anniversary of the Human Genome Sequence and 21<sup>st</sup> Century Postgenomics Global Health - A Close Up on Africa and Women's Health. *Curr Pharmacogenomics Person Med.* 2011, 9(3), 148-155.
44. **Ray S**, Ray S, D'souza R, Srivastava S. Nanotechniques and proteomics: An integrated platform for diagnostics, targeted therapeutics and personalized medicine. *Curr Pharmacogenomics Person Med.* 2011, 9(4), 264-285.
45. **Ray S**, Reddy PJ, Jain R, Gollapalli K. Moiyadi A, Srivastava S. Proteomic technologies for the identification of disease biomarkers in serum: advances and challenges ahead. *Proteomics* 2011, 11, 2139-2161.
46. **Ray S**, Chandra H, Srivastava S. Nanotechniques in proteomics: current status promises and challenges. *Biosens Bioelectron.* 2010, 25(11), 2389-2401.
47. **Ray S**, Mehta G, Srivastava S. Label-free detection techniques for protein microarrays: prospects, merits and challenges. *Proteomics* 2010, 10(4), 731-748.

## B. Preprints [2]

1. Jha PK, Valekunja UK, **Ray S**, Nollet M, Reddy AB. Single-cell transcriptomics and cell-specific proteomics reveals molecular signatures of sleep. bioRxiv 2020, DOI: 10.1101/2020.12.18.423331.

2. Rando HM, MacLean AL, Lee AJ, **Ray S**, Bansal V, et al., Pathogenesis, Symptomatology, and Transmission of SARS-CoV-2 through analysis of Viral Genomics and Structure. arXiv.org 2021, Bibcode: 2021arXiv210201521R (PMID: 33594340).

### C. Magazine Editorials [2]

1. **Ray S<sup>ψ</sup>** and Srivastava S<sup>ψ</sup>. Trends and roadblocks in proteomics research in India. *Nature India* (Special Issue: Proteomics Research in India) 2015, 6-8, doi: 10.1038/nindia.2015.111.
2. **Ray S<sup>ψ</sup>**, Srivastava S, Nair B, Diwakar S. E-learning resources and virtual labs. *Nature India* (Special Issue: Proteomics Research in India) 2015, 13-14, doi: 10.1038/nindia.2015.114.

### D. Book chapters [5]

1. Bhatnagar A, Puppala A, Rankawat S, Ray S, **Ray S<sup>ψ</sup>**. Role of Circadian Rhythms in Metabolic Syndrome, Book chapter in "*Metabolic Syndrome from Mechanisms to Interventions*" Elsevier 2022, ISBN: 9780323857321 (In press).
2. **Ray S<sup>ψ</sup>**, Srivastava S, Diwakar S, Nair B, Özdemir V. Delivering on the Promise of Bioeconomy in Developing World: Link it with Social Innovation and Education. In: "*Biomarker Discovery in the Developing World: Dissecting the Pipeline for Meeting the Challenges*". Springer 2016, DOI: [https://doi.org/10.1007/978-81-322-2837-0\\_6](https://doi.org/10.1007/978-81-322-2837-0_6), pp 73-81 (ISBN: 978-81-322-2835-6).
3. **Ray S** and Özdemir V. Angel Philanthropy and Crowdfunding to Accelerate Cancer Research in Developing World. In: "*Biomarker Discovery in the Developing World: Dissecting the Pipeline for Meeting the Challenges*". Springer 2016, DOI: [https://doi.org/10.1007/978-81-322-2837-0\\_5](https://doi.org/10.1007/978-81-322-2837-0_5), pp 65-71 (ISBN: 978-81-322-2835-6).
4. Gupta S, **Ray S**, Talukdar A, Sehgal K, Moiyadi A, Srivastava S. Geographic pervasiveness of cancer: Prospects of novel biomarker and therapeutic research in developing countries using OMICs approaches. In: "*Biomarker Discovery in the Developing World: Dissecting the Pipeline for Meeting the Challenges*". Springer 2016, DOI: [https://doi.org/10.1007/978-81-322-2837-0\\_2](https://doi.org/10.1007/978-81-322-2837-0_2), pp 9-17 (ISBN: 978-81-322-2835-6).
5. Syed P, **Ray S**, Gollapalli K, Srivastava S. Serum proteomics for studying disease pathogenesis and identification of disease biomarkers. In: *Proteomics: targeted technology, innovations and applications*. Caister Academic Press 2014, ISBN: 978-1-908230-46-1, pp 1-17 (ISBN: 978-1-908230-46-1).

### E. Patents (Granted/filed) [5]

1. Prof. Sanjeeva Srivastava, **Dr. Sandipan Ray**, Dr. Veenita Grover Shah. Label-Free Method for Detection and Quantification of Protein Biomarkers [India-Patent No. 394414 (Granted, Award Date: 07/04/2022)].
2. Prof. Sanjeeva Srivastava, Prof. Swati Patankar, **Mr. Sandipan Ray**, Dr. Urmila Thatte, Dr. Nithya Gogtay, Dr. Durairaj Renu, et al. Protein Biomarkers for *Plasmodium vivax* Malaria [India-Patent No. 336131 (Granted, Award Date: 28/04/2020)].
3. Prof. Sanjeeva Srivastava, Prof. Rajneesh Srivastava, **Mr. Sandipan Ray**, Mr. Vineet Vaibhav. Protein Biomarkers for Leptospirosis [India-Patent No. 336123 (Granted, Award Date: 28/04/2020)].

4. Prof. Sanjeeva Srivastava, Prof. Swati Patankar, **Mr. Sandipan Ray**, Dr. Urmila Thatte, Dr. Nithya Gogtay, Dr. Durairaj Renu, et al. Protein Biomarkers for *Plasmodium falciparum* Malaria [IPA No. 201922050215; Publication Date: 05/12/2019].
5. Prof. Sanjeeva Srivastava, **Dr. Sandipan Ray**, Mr. Vipin Kumar. Method for Detection of Protein Biomarkers for Different Complications of Falciparum Malaria [IPA No. 202021002027; Publication Date: 23/07/2021].

## CONFERENCE AND INVITED TALKS (SELECTED)

Total Conference/meeting abstracts: 36 [as a presenting author 18; as a co-author 18]. A selection is reported here:

1. **13th Annual Meeting of Proteomics Society, India**, Oct 2021, CSIR-CCMB (Invited Speaker)
2. **International Conference on Chronobiology 2021**, July 2021, JNCASR-India, UC Davis- USA (Invited Speaker)
3. **Clock Meeting Series - Chronobiology & Sleep Institute**, September 2019, University of Pennsylvania, USA (Invited Speaker)
4. **Human Proteome Organization 17th Annual World Congress**, October 2018, Orlando, Florida, USA (Talk)
5. **EMBO-EMBL Symposium: Biological Oscillators: Design, Mechanism, Function**, June 2018, EMBL Heidelberg, Germany (Talk)
6. **Biomedical Sciences Research Seminar Program**, May 2018, Nottingham Trent University, UK (Invited Speaker)
7. **Indo-UK Symposium on Precision Medicine**, November 2017, IIT Bombay, Mumbai, India (Invited Speaker)
8. **Proteomics Methods Forum Conference**, June 2017, University of Oxford, UK (Talk)
9. **EMBO Young Scientists' Forum 2016**, September 2016, Lisbon, Portugal (Talk)
10. **6<sup>th</sup> Annual Meeting of Proteomics Society, India and International Proteomics Conference on “Proteomics from Discovery to Function”**, December 2014, IIT Bombay, Mumbai, India (Poster)
11. **6<sup>3rd</sup> Annual Meeting of American Society of Tropical Medicine and Hygiene**, November 2014, New Orleans, USA (Talk)
12. **1<sup>st</sup> Western Chapter Conference of Indian Academy of Tropical Parasitology**, December 2013, TN Medical College and BYL Nair Hospital, Mumbai, India (Invited Speaker)
13. **Amrita BioQuest 2013; International Conference on Biotechnology for Innovative Applications**, August 2013, Kerala, India (Talk)
14. **Human Proteome Organization 11<sup>th</sup> Annual World Congress**, September 2012, Boston, USA (Poster)
15. **US Human Proteome Organization (US-HUPO) 8<sup>th</sup> Annual Conference - “The Future of Proteomics”**, March 2012, San Francisco, USA (Poster)
16. **International Scientific Meeting- “Recent Developments in Malaria Research”**, December 2010, ICGB, New Delhi, India (Poster)



## PROFESSIONAL ASSOCIATIONS

- Royal Society of Biology (RSB), UK [Elected Member, 2020]
- Institute for Translational Medicine and Therapeutics (ITMAT), University of Pennsylvania, USA [Affiliate Member]
- Human Proteome Organization (HUPO) [Annual Membership-Since 2012]
- US- Human Proteome Organization US-HUPO [Membership-Since 2012]
- Society of Biological Chemists, India (SBC) [Life member]
- Indian Society for Chronobiology (InSC) [Life member]
- Proteomics Society, India (PSI) [Life member]
- American Society of Tropical Medicine and Hygiene (ASTMH) [Annual Membership-2014]
- International Society for Infectious Diseases (ISID)
- American Committee of Molecular, Cellular and Immuno-parasitology (ACMCIP)
- Biotech Forum, Guha Centre for Genetic Engineering & Biotechnology, University of Calcutta

## REVIEWER FOR JOURNALS

- World Neurosurgery (ELSEVIER; ISSN: 1878-8750)
- PLOS One (Public Library of Science; eISSN: 1932-6203)
- Frontiers in Cellular and Infection Microbiology (ISSN: 2235-2988)
- Frontiers in Microbiology (ISSN: 1664-302X)
- International Immunopharmacology (ELSEVIER; ISSN: 1567-5769)
- Scientific Reports (Nature Publishing Group; ISSN: 2045-2322)
- Journal of Proteomics (ELSEVIER; ISSN: 1874-3919)
- International Journal of Molecular Sciences (MDPI, ISSN: 1422-0067)
- OMICS: A Journal of Integrative Biology (Mary Ann Liebert, Inc.; ISSN: 1536-2310)
- STAR Protocols (Cell Press, ISSN: 2666-1667)
- International Journal of General Medicine (Dovepress, ISSN: 1178-7074)