

## 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 (GCGEB), 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**  
 Dec 2018 Research topic: Multiplexed quantitative mass spectrometry to understand the underlying mechanisms of circadian rhythmicity and sleep-wake cycles

Dec 2016- **Visiting Scientist - University of Cambridge, UK**  
 April 2017 Research topic: Systems biology approaches to understanding the cross-talk among circadian clocks, sleep-wake cycles, and metabolic networks

Feb 2015 - **Postdoctoral Research Associate - University of Cambridge, UK**  
 Dec 2016 Research topic: Systems biology approaches to understanding the cross-talk among circadian clocks, sleep-wake cycles, and metabolic networks

June - Dec **Research Associate - IIT Bombay, India**  
 2014 Research topic: Proteomics and metabolomics analysis of *Plasmodium vivax* induced alterations in humans from different endemic regions of India

July 2009 - **Doctoral Research Fellow (Ph.D. Student) - IIT Bombay, India**  
 June 2014 Research topic: Proteomics analysis of serum in vivax and falciparum malaria patients to investigate the pathogenesis and identify surrogate protein markers of infection

May - July **Summer Research Fellow - Centre for Cellular and Molecular Biology, India**  
 2008 Research topic: Characterization of the genes of recFOR and recBCD DNA repair pathways in the Antarctic psychrotrophic bacterium *Pseudomonas syringae* Lz4W

## RESEARCH INTERESTS

Circadian clocks and sleep  
 Neuropharmacology  
 Systems biology

Infectious diseases  
 Aging  
 Clinical proteomics and mass spectrometry

Neurological and metabolic disorders  
 Mental health

## FELLOWSHIPS, AWARDS, AND HONOURS (SELECTED)

- 2024: **Faculty Research Excellence Award 2024, IIT Hyderabad**
- 2023: Invited member of **Board of Studies (BoS), Department of Biotechnology, Woxsen University**
- 2023: Elected as an **Executive Committee member of the Indian Society for Chronobiology (InSC)**
- 2021: Selected for Affiliate Membership of the **Institute for Translational Medicine and Therapeutics, USA**
- 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 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, TEACHING, AND OUTREACH

- Acting as the thesis supervisor and mentor for 7 Ph.D. (2 PMRFs). and 3 M.Tech students
- Teaching courses for UG (B.Tech) and PG (M.Tech and Ph.D.) students at IIT Hyderabad
  - Proteomics: Techniques and Applications (BT6303)
  - Circadian Clocks: Mechanisms and Functions (BT6050)
  - Medical Microbiology and Infectious Diseases (BT5050)
  - Microbiology (BT2040)
  - Genomics, Transcriptomics, Proteomics (BT3050)
- Invited faculty mentor in the "Winter School on Application of Mass Spectrometry in Biomedical Research" at GITAM Deemed to be University, Visakhapatnam - March 2024.
- Invited faculty mentor in the School in Chronobiology and Chronomedicine 2023, King George Medical University (KGMU), Lucknow– organized by the Indian Society for Chronobiology and the Indian Society for Chronomedicine – January 2023
- Invited resource person in the Monsoon Advanced Proteomics School (MAPS) – 2022 organized by IIT Bombay and Department of Science & Technology (DST) – July 2022
- 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 the 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 Ph.D. 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 training 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: 2444; h-index = 27; i10-index = 44 (Source – Google Scholar)**

**‡ Equal contribution; \* Corresponding author**

### **A. Journal Publications [56]**

#### **2022-2024**

1. Das S, Khan R, Banerjee S, Ray S, **Ray S\***. Alterations in circadian rhythms, sleep, and physical activity in COVID-19: mechanisms, interventions, and lessons for the future. *Mol Neurobiol.* 2024 (In press).
2. Ghosh PK, Rao JM, Putta LC, **Ray S\***, Rengan AK\*. Telomerase: A nexus between cancer nano therapy and circadian rhythm. *Biomater Sci.* 2024 (In press).
3. Kunjulakshmi R, Kumar A, et al., **Ray S**, Tiwari B, Kumar R. AagingBase: A Comprehensive Database of Anti-aging Peptides. *Database* 2024, doi: 10.1093/database/baae016.
4. Bhatnagar A, Murray G, **Ray S\***. Circadian biology to advance therapeutics for mood disorders. *Trends Pharmacol Sci.* 2023, 44(10), 689-704.
5. Rankawat S, Kundal K, Chakraborty S, Kumar R, **Ray S\***. A comprehensive rhythmicity analysis of host proteins and immune factors involved in malaria pathogenesis to decipher the importance of the host circadian clock in malaria. *Front Immunol.* 2023, 14, 1210299.
6. Chakraborty S, Kannihalli A, Mohanty A, **Ray S\***. The promise of proteomics and metabolomics for unraveling the mechanism and side effect landscape of beta-adrenoreceptor antagonists in cardiovascular therapeutics. *OMICS* 2023, 27(3), 87–92.
7. Banerjee S, **Ray S\***. Circadian medicine for aging attenuation and sleep disorders: Prospects and challenges. *Prog Neurobiol.* 2023, 220, 102387.

8. Banerjee S, Chakraborty S, **Ray S\***. Systems biology of Covid-19 and human diseases: beyond a bird's eye view, and toward One Health. *OMICS* 2023, 27(1), 2-5.
9. Jha PK, Valekunja UK, **Ray S**, Nollet M, Reddy AB. Single-cell transcriptomics and cell-specific proteomics reveal molecular signatures of sleep. *Commun Biol. Nature* 2022, 5(1), 846.

## 2019-2021

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10. Puppala A, Rankawat S, **Ray S\***. Circadian Timekeeping in Anticancer Therapeutics: An Emerging Vista of Chronopharmacology Research. *Curr Drug Metab.* 2021, 22, 998-1008.
11. 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.
12. 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.
13. 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.
14. 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.
15. Rajarshi K, Khan R, Singh MK, Ranjan T, **Ray S\***, Ray S. Essential functional molecules associated with SARS-CoV-2 infection: Potential therapeutic targets for COVID-19. *Gene.* 2021, 768,145313.
16. **Ray S\***, Reddy AB. COVID-19 management in light of the circadian clock. *Nat Rev Mol Cell Biol.* 2020, 21(9), 494-495.
17. 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.
18. **Ray S\***, Srivastava S. Virtualization of Science Education: A Lesson from the COVID-19 Pandemic. *J Proteins Proteom.* 2020, 11, 77-80.
19. **Ray S**, Srivastava S. COVID-19 Pandemic: Hopes from Proteomics and Multi-Omics Research. *OMICS* 2020. 24(8), 457-459.
20. 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.
21. **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].
22. **Ray S\***, 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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23. 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].

24. **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.
25. **Ray S**, Patel SK, Venkatesh A, Bhave 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.
26. **Ray S**, Reddy AB. Cross-talk between circadian clocks, sleep-wake cycles, and metabolic networks: Dispelling the darkness. *Bioessays.* 2016, 38(4), 394-405.
27. 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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28. 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.
29. **Ray S**, Kumar V, Bhave 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. Reddy PJ<sup>ψ</sup>, **Ray S**<sup>ψ</sup>, Srivastava S. The quest of the human proteome and the missing proteins: digging deeper. *OMICS* 2015, 19(5), 276-282.
36. **Ray S**, Bhave A, Srivastava S. Brainstorming the new avenues for translational proteomics research: first Indo-US bilateral proteomics workshop. *Current Proteomics* 2015, 12, 75-79.
37. Gupta S<sup>ψ</sup>, Reddy JP<sup>ψ</sup>, **Ray S**<sup>ψ</sup>, 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.
38. Gupta S<sup>ψ</sup>, Venkatesh A<sup>ψ</sup>, **Ray S**<sup>ψ</sup>, Srivastava S. Challenges and prospects for biomarker research: a current perspective from biomarker research. *Biochim Biophys Acta.* 2014, 1844(5), 899-908.
39. **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.
40. Sharma S<sup>ψ</sup>, **Ray S**<sup>ψ</sup>, Moiyadi A, Sridhar E, Srivastava S. Quantitative proteomic analysis of meningiomas for the identification of surrogate protein markers. *Nature Sci Rep.* 2014, 4, 7140.

41. **Ray S**, Moiyadi A, Srivastava S. Biorepositories for cancer research in developing countries. *Nat Rev Clin Oncol.* 2013, *10*, 434-436.
42. 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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43. **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.
44. **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.
45. **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.
46. Srivastava R<sup>ψ</sup>, **Ray S**<sup>ψ</sup>, Vaibhav V, Gollapalli K, et al., Serum profiling of leptospirosis patients to investigate proteomic alterations. *J Proteomics.* 2012, *76*, 56-68.
47. 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.
48. **Ray S**, Koshy NR, Diwakar S, Nair B, Srivastava S. Sakshat Labs: India's virtual proteomics initiative. *PLoS Biol.* 2012, *10*(7): e1001353.
49. **Ray S**, Koshy NR, Reddy PJ, Srivastava S. Virtual Labs in Proteomics: New E-Learning Tools. *J Proteomics.* 2012, *75*, 2515-2525.
50. Reddy PJ, Sadhu S, **Ray S**, Srivastava S. Cancer biomarker detection by surface plasmon resonance biosensors. *Clin Lab Med.* 2012, *32*(1), 47-72.
51. **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.
52. 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.
53. **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.
54. **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.
55. **Ray S**, Chandra H, Srivastava S. Nanotechniques in proteomics: current status promises and challenges. *Biosens Bioelectron.* 2010, *25*(11), 2389-2401.
56. **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\*** and Srivastava S\*. 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\***, 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 [6]

1. Banerjee S, Das S, Halder N, Bisht S, Talukdar A, **Ray S\***. Chronobiological Aspects of Aging, Neurodegeneration, and Inflammation, Book chapter in "*Current Topics in Behavioral Neurosciences*" Springer 2024 (In press).
2. Bhatnagar A, Puppala A, Rankawat S, Ray S, **Ray S\***. Role of Circadian Rhythms in Metabolic Syndrome, Book chapter in "*Metabolic Syndrome from Mechanisms to Interventions*" Elsevier 2024, 199-218 (Paperback ISBN: 9780323857321; eBook ISBN: 9780323856584).
3. **Ray S\***, 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).
4. **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).
5. 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).
6. 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, Prof. Swati Patankar, **Dr. Sandipan Ray**, Dr. Urmila Thatte, Dr. Nithya Gogtay, Dr. Durairaj Renu, et al. Protein Biomarkers for *Plasmodium falciparum* Malaria [India-Patent No. 512772; Granted, Award Date: 20/02/2024]



2. 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)].
3. Prof. Sanjeeva Srivastava, Prof. Swati Patankar, **Dr. 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)].
4. Prof. Sanjeeva Srivastava, Prof. Rajneesh Srivastava, **Dr. Sandipan Ray**, Mr. Vineet Vaibhav. Protein Biomarkers for Leptospirosis [India-Patent No. 336123 (Granted, Award Date: 28/04/2020)].
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].

## FUNDED RESEARCH PROJECTS

**(A) International:** Validation of a translatable chronobiological signature of early relapse in bipolar disorder, Wellcome Trust (226945/Z/23/Z, Multinational project), One of the 3 **chief investigators (and the lead investigator/PI from India)**, **5.45 crore INR (1 million AUD)** for Dr. Sandipan Ray (Total grant amount: **AUD 4,275,992, corresponding to 23 Crore INR**, 5 years. 2024-2029).

### **(B) National:**

#### **(B1) As PI:**

1. Comprehensive characterization of the circadian regulations of kinases and diverse signaling pathways, **SERB-SRG** (SRG/2021/000671), 2 years (2021–2023), **28.71 Lakh INR**
2. Investigation on the cross-talk among circadian aberrations, sleep deficiency, aging, and dna damage for potential health and therapeutic benefits, **ICMR** (BMS/Adhoc/184/2022-23), 3 years, (2023–2026), **87.5 Lakh INR**.

#### **(B2) As Co-PI:**

3. Nano-transformable hydrogel for targeted chemoimmunotherapy of breast cancer, **SERB-SUPRA** (SPR/2022/000230), 3 years (2023 –2026), **79.13 Lakh INR**
4. Understanding the mechanism of degradation of cytoplasmic DNA containing alkyl-adducts. **SERB-CRG** (CRG/2022/000183), 2 years (2023 –2025), **42.10 Lakh INR**
5. In-situ nano-transformable hydrogel for affordable targeted therapy of highly metastatic cancers. **SOCH-IIT Hyderabad**, 2 years (2022 –2024), **100 Lakh INR**.
6. Mechanistic insights into the enhanced permeability and retention, abscopal effect, and circadian timekeeping machinery for improved targeted therapeutics for colorectal cancer. **MoE-STARS** (MoE-STARS/STARS-2/2023-0640), 3 years (2023-2026), **63 Lakh INR**.
7. Role of ALKBH family protein in promoting triple-negative breast cancer. **ICMR**, 3 years (2024-2027), **51.72 Lakh INR**.
8. Neural Structures and mechanisms involved in motor memory reconsolidation. **DBT**. 3 years (2024-2027), **74.10 Lakh INR**.

## CONFERENCE AND INVITED TALKS (SELECTED)

Total Conference/meeting abstracts: 43 [as a presenting author 23; co-author/corresponding author 20].

1. International conference "**Advances in Proteomics Technologies (APT)-2024**", Feb 2024, IIT Bombay (Invited Speaker)
2. **International Symposium on Chronobiology and Mental Health**, March 2023, University of Delhi, (Invited Speaker)
3. **NCBS Annual Talks 2023**, "Patterns in Biology," Jan 2023 (Invited Speaker)
4. **14<sup>th</sup> Annual Meeting of the Proteomics Society of India and International Conference on Proteins & Proteomics (PSI-ICPP 2022)**, Nov 2022, CSIR-IICB (Invited Speaker)
5. **13<sup>th</sup> Annual Meeting of Proteomics Society, India**, Oct 2021, CSIR-CCMB (Invited Speaker)
6. **International Conference on Chronobiology 2021**, July 2021, JNCASR-India, UC Davis- USA (Invited Speaker)
7. **Clock Meeting Series - Chronobiology & Sleep Institute**, September 2019, University of Pennsylvania, USA (Invited Speaker)
8. **Human Proteome Organization 17<sup>th</sup> Annual World Congress**, October 2018, Orlando, Florida, USA (Talk)
9. **EMBO-EMBL Symposium: Biological Oscillators: Design, Mechanism, Function**, June 2018, EMBL Heidelberg, Germany (Talk)
10. **Biomedical Sciences Research Seminar Program**, May 2018, Nottingham Trent University, UK (Invited Speaker)
11. **Indo-UK Symposium on Precision Medicine**, November 2017, IIT Bombay, Mumbai, India (Invited Speaker)
12. **Proteomics Methods Forum Conference**, June 2017, University of Oxford, UK (Talk)
13. **EMBO Young Scientists' Forum 2016**, September 2016, Lisbon, Portugal (Talk)
14. **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)
15. **6<sup>3rd</sup> Annual Meeting of American Society of Tropical Medicine and Hygiene**, November 2014, New Orleans, USA (Talk)
16. **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)
17. **Amrita BioQuest 2013; International Conference on Biotechnology for Innovative Applications**, August 2013, Kerala, India (Talk)
18. **Human Proteome Organization 11<sup>th</sup> Annual World Congress**, September 2012, Boston, USA (Poster)
19. **US Human Proteome Organization (US-HUPO) 8<sup>th</sup> Annual Conference - "The Future of Proteomics"**, March 2012, San Francisco, USA (Poster)
20. **International Scientific Meeting- "Recent Developments in Malaria Research"**, December 2010, ICGEB, 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)
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- Biotech Forum, Guha Centre for Genetic Engineering & Biotechnology, University of Calcutta

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