

Dipasree Hajra

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LANGUAGE

English

Bengali

Hindi

EDUCATION

Qualification	Name of Institution	Date/Year	Marks Obtained (%)
X Standard	Vivekananda Mission School, Joka, Kolkata, West Bengal.	2011	93.4
XII Standard	Vivekananda Mission School, Joka, Kolkata, West Bengal.	2013	96.25
B.Sc in Life Sciences (Hons.)	Presidency University, Kolkata, West Bengal, India.	2016	89.2% (CGPA-9.63 out of 10) Gold Medalist
M.Sc in Biotechnology	University of Hyderabad, India.	2018	CGPA-9.6 (out of 10) Gold Medalist
PhD (2018 batch)	Indian Institute of Science, Bengaluru, India.	2024	Course Work CGPA-9.1 (Highest)

AWARDS AND ACHIEVEMENTS

- Received the prestigious **Saroj Chandrasekhar Memorial Award** 2024 for excellence in bioscience and biotechnology research.
- Nominated candidate from the Indian Institute of Science, Bangalore for the Schmidt Fellowship Programme, 2023.**
- Presented my thesis research work at EMBO-EMBL Symposia on “The Human Microbiome” held at EMBL Advanced Training Center, Heidelberg, Germany on September 20-23, 2023.**
- Received Travel Grant from Science and Engineering Research Board (Statutory Body Established Through an Act of Parliament: SERB Act 2008) Department of Science and Technology, Government of India for presenting a part of my thesis research work (Poster) in Cell Symposia: Infection in the age of the microbiome in Institute Pasteur, Paris, France.**
- Presented **oral talk at IUMS 2022 Conference, Rotterdam, Netherlands** entitled “The extracellular loops of *Salmonella* Typhimurium outer membrane protein A (OmpA) maintain the stability of *Salmonella* containing vacuole (SCV) in macrophages and protect the bacteria from autophagy-dependent lysosomal degradation” held on July 20-22,2022.

6. Awarded with the Most Popular Blot Award in the **The Better Scientist - Battle of the Blots** program organized by BioRad.
7. Recipient of the prestigious **Shyama Prasad Mukherjee (SPM) Fellowship**.
8. Received **Gold Medal for securing first position in Department of Biotechnology, University of Hyderabad** and received **Gold medal for securing highest mark from Faculty of Sciences, School of Life Sciences, University of Hyderabad**.
9. Qualified as Junior Research Fellow (JRF) in **National Eligibility Test conducted by Council of Scientific and Industrial Research (CSIR) in June,2017** and secured **all India rank of 3 in it**.
10. Cleared CSIR NET at B.Sc level in June,2016 with 62% marks but was not eligible due to age criteria.
11. Received **gold medal from President of India, Mr. Pranab Mukherjee, for securing highest score in sciences from Presidency University in Bachelors of Sciences in the bicentennial year**.
12. Secured Rank 32 in JNU CEEB Entrance Test.
13. Qualified JGEEBILS Entrance Examination and ranked 86 in Joint Entrance Examination (JAM) ,2016, Biotechnology.
14. Presented poster in National Symposium entitled “Molecules to Systems” organised by Presidency University.
15. Received **Gold Medal for securing the first rank in Bachelor of Sciences in Life Sciences from Presidency University**.
16. Received **Aparajita Memorial Award, Prof. Sachidananda Banerjee Book Prize, Prof. SC Mahalanabish Memorial Prize, Dharendra Nath Chatterjee Memorial Prize, Aparajita Chattopadhyay Memorial Prize, Prof. Sivatosh Mookherjee Memorial Prize** for securing **first position in B.Sc. in Life Sciences** from Presidency University, Kolkata.
17. Recipient of **Prof. Anil Kumar Bhattacharya Memorial Prize, Dr. Shyama Prasad Mookherjee Gold Medal, Nirode Baran Bakshi Memorial Prize, Scindia Silver Medal and Gwalior Book Prize** for securing **First position in the Faculty of Science (UG), 2016**.
18. 3. Selected Summer Research Fellow of **Indian Academy of Sciences for the year 2015 and 2017**.
19. Summer Research Fellow of 2015 at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore and worked under the guidance of Prof. Kaustuv Sanyal in the project entitled “Construction of adenine auxotrophic mutants in *Candida tropicalis* “. My fellowship got renewed for the following year,2016.
20. DST INSPIRE-sponsored internship at Jagadish Bose
National Science Talent Search (JBNSTS), Kolkata in the year 2011.

2015 (May-July)

I worked on the construction of ADE2 auxotrophic mutant of *Candida tropicalis* by creating ADE2 deletion cassette with NAT (NourseothricinAcetylTransferase) marker during the summer research programme of JNCASR, 2015 in the laboratory of Prof. Kaustuv Sanyal in second year of my bachelor using FLP recombinase mediated gene deletion technique. Homozygous auxotrophic mutants for ADE2 were obtained after two rounds of insertion and excision of the cassette by FLP-mediated excision. These mutants showed pink coloration compared to their wild type counterparts. This would serve as a phenotypic marker for visualization and understanding of different genetic events in *C.tropicalis* which is a potent pathogen responsible for skin diseases in immunocompromised patients.

2015-2016

I have also worked on a project during my bachelor's involved in identifying the mechanism of TRAIL-mediated evasion of apoptosis by tumor cells in the laboratory of Dr. Ranjana Pal, Presidency University, Kolkata. I primarily worked in the curation of COSMIC database to find out mutation rates, the relative distribution of different mutations in different tumor samples, copy number variation, and differential protein expression in different tumor samples of TRAIL and its receptors. I found that there is a correlation between copy number variation (CNV) and protein expression with the exception of decoy receptor 2 (DcR2) in breast cancer. DcR2 showed overexpression of protein in spite of CNV loss. The study showed the evasive mechanism of various tumor samples in spite of the higher expression of TRAIL. Numerous tumor samples showed lower expression of death receptors DR4 and DR5 and higher expression of decoy receptors and OPG. Moreover, various mutations in domains of TRAIL or its receptors can prevent the death receptor pathway activation.

2017-2018

During my Master's dissertation, I investigated the effect of glutamate and aspartate on the stability and fibrillation propensity of Lysozyme under the guidance of Dr. N Prakash Prabhu, University of Hyderabad, India. The study depicted the ability of glutamate and aspartate to increase the stability of lysozyme against thermal denaturation and to retard fibril formation kinetics.

TECHNICAL EXPERTISE AND VISION

My tenure as a doctoral student not only sharpened my technical capabilities, and scientific insight and helped me acquire critical analytical thinking but has also fostered my passion for unraveling the mechanism underlying the complex interplay between host and pathogens. With a strong foundation in infection disease biology research, honed through my doctoral research and subsequent experience, I possess a comprehensive skill set vital for investigating and understanding infectious agents, immune modulation, and their mechanisms of pathogenesis. Throughout my academic journey, I have developed proficiency in conceptualization, experimental design, and its execution, complex problem-solving abilities, critical analysis of datasets, and deriving research findings. I have learned, standardized, and introduced techniques such as nanostring gene profiling, flow cytometric studies, metabolic assays, *in vivo* shRNA-mediated knockdown in mice, and protein immunoprecipitation in the laboratory. My technical expertise includes mice infection experimentations, flow cytometric experiments in mice tissues and cell culture models, immunoblotting, protein-protein interactions, mitophagy studies, estimation of cellular and

mitochondrial ROS, mitochondrial function assays, quantitative gene profiling, ELISA, metabolic assays such as lactate and ATP production, Seahorse experiments, TEM, immunohistochemistry, immunofluorescence imaging and *in vitro* and *in vivo* biofilm formation assays facilitating detailed characterization of host-pathogen interactions. My strength lies in my ability to overcome any challenges that our day-to-day research work throws at us by coming up with a plausible solution to address the question with my earned perseverance. Though I have been an independent thinker and researcher, however, I have nurtured the ability to be a great team player as evidenced by several collaborative projects that I have been part of. I have a strong track record of leading multi-authored projects, and collaborations as evidenced by my collaboration in intradepartmental (Prof. Amit Singh, IISc Bangalore), interdepartmental (Prof. Utpal Tatu (Department of Biochemistry, IISc), Prof. Mahipal Ganji (Department of Biochemistry, IISc), Prof. Saptarshi Basu (Department of Mechanical Engineering, IISc)), and interinstitutional (Prof. Anirban Banerjee, IIT Bombay, Prof. Shashi K Gupta CDRI, Lucknow) collaborative projects.

Leveraging these skills, my vision is to advance our understanding of infectious diseases, particularly in elucidating novel therapeutic targets and developing innovative intervention strategies. I am committed to interdisciplinary collaboration and translational research, aiming to bridge the gap between basic science discoveries and clinical applications to combat infectious diseases effectively in the future. I am immensely excited to bring my skill set to your lab and contribute to the collective pursuit of science.

MENTORING EXPERIENCE

I have a proven track record of mentoring and supervising over 19 trainees and junior students, of various age groups (ranging from high school students to doctoral students), providing guidance in experimental design, data analysis, and data presentation. Many of them are continuing their doctoral research in eminent universities in India and abroad. Through this mentoring experience, I have cultivated leadership and a collaborative and supportive research environment, fostered the professional development of emerging scientists while advancing our current understanding of infectious diseases.

I have performed a teaching associateship during the second year of my PhD tenure to undergraduate students in Microbiology course which helped me develop teacher-student interaction skills. Additionally, I was a nominated student participating in Teaching workshop for Certified Teacher Education Course organized by Centre of Excellence in Teacher Education (CETE), Tata Institute of Social Sciences on 23rd June, 2022.

LIST OF PUBLICATIONS

1. **Hajra D**, Rajmani RS, Chakravorty D. (2024) Salmonella-induced SIRT1 and SIRT3 are crucial for maintaining the metabolic switch in bacteria and host for successful pathogenesis *eLife***13**: RP93125 (**In press, Elife**)
2. Roy Chowdhury A*, **Hajra D***, Mukherjee D*, Nair AV, Chakravorty D. Functional OmpA of Salmonella Typhimurium provides protection from lysosomal degradation and inhibits autophagic processes in macrophages. *J Infect Dis.* 2024

Jul 30;jiae376. doi: 10.1093/infdis/jiae376. Epub ahead of print. PMID: 39078938.

* Equal contribution.

3. Agharkar N.A*, **Hajra D***, Jaiswal V, Kabi P, Chakravortty D, Basu S. Evaporation of bacteria-laden surrogate respiratory fluid droplets on a hydrophilic substrate versus contact free environment confers differential bacterial infectivity. * Equal contribution. (**Accepted, *Physics of Fluids***, POF-24-AR-000158R)
4. **Hajra D**, Kirthivasan N, Chakravortty D. Symbiotic Synergy from Sponges to Humans: Microflora-host harmony is crucial for ensuring survival and shielding against invading pathogens. ACS Infectious Diseases.2023. <https://doi.org/10.1021/acsinfecdis.3c00554>
5. **Hajra D**, Yadav V, Singh A, Chakravortty D. SIRT1 and SIRT3 impact host mitochondrial function and host-*Salmonella* pH balance during infection. bioRxiv 2023.09.11.557159; doi: <https://doi.org/10.1101/2023.09.11.557159>
(Under Revision)
6. Ghosh S, Roy S, Baid N, Das K U, **Hajra D**, Menon S et al. A host AAA-ATPase exhibits bacteriolytic activity for clearance of microbial infection. bioRxiv 2023.07.18.549519; doi: <https://doi.org/10.1101/2023.07.18.549519>. (**In communication**)
7. **Hajra D**, Mukherjee D, Vij R, Rajmani S, Tatu U, Chakravortty D. *Odoribacter splanchnicus* mitigates *Salmonella*-induced gut inflammation and its associated pathogenesis. (**Under preparation**)
8. **Hajra D**, Nair AV, Chakravortty D. Decoding the invasive nature of a tropical pathogen of concern: The invasive non-Typhoidal *Salmonella* strains causing host-restricted extraintestinal infections worldwide. Microbiol Res. 2023 Dec;277:127488. doi: 10.1016/j.micres.2023.127488. Epub 2023 Sep 12. PMID: 37716125.
9. Chatterjee R, Chowdhury AR, Nair AV#, **Hajra D#**, Kar A, Datey A, Shankar S, Mishra RK, Chandra N, Chakravortty D. *Salmonella* Typhimurium PgtE is an essential arsenal to defend against the host resident antimicrobial peptides. Microbiol Res. 2023 Jun;271:127351. doi: 10.1016/j.micres.2023.127351. Epub 2023 Mar 11.PMID: 36931126 #-Equal contribution.
10. **Hajra D**, Nair AV, Roy Chowdhury A, Mukherjee S, Chatterjee R, Chakravortty D. *Salmonella* Typhimurium U32 peptidase, YdcP, promotes bacterial survival by

conferring protection against in vitro and in vivo oxidative stress. *Microb Pathog.* 2022;173(Pt B):105862. doi:10.1016/j.micpath.2022.105862.

11. **Hajra D**, Nair AV, Chakravorty D. An elegant nano-injection machinery for sabotaging the host: Role of Type III secretion system in virulence of different human and animal pathogenic bacteria. *Phys Life Rev.* 2021 Sep;38:25-54. doi: 10.1016/j.plrev.2021.05.007. Epub 2021 May 26. PMID: 34090822.
12. **Hajra D**, Datey A, Chakravorty D. Attenuation Methods for Live Vaccines. *Methods Mol Biol.* 2021;2183:331-356. doi: 10.1007/978-1-0716-0795-4_17. PMID: 32959252.