

## Curriculum vitae

**Name: Budhaditya Mukherjee**

### Independent group leader position(s)

Dates (mm/yyyy)	Details
10/2019	PI of Infectious Diseases and Immunology Lab (IDI), School of Medical Science and Technology, IIT Kharagpur. Primary interest of IDI lab is to work on several aspects of intracellular protozoan pathogens interaction with their hosts using <i>Leishmania</i> , <i>Toxoplasma</i> as model system. IDI lab focuses to decipher cellular, immunological aspects of infected host which might be utilized by intracellular pathogens leading to emergence of drug resistance. IDI lab analyses genome architecture of clinical isolates and utilizes genome-based modifications to characterize parasite derived factors contributing in their intracellular survival.

### Post-doctoral research

Dates (mm/yyyy)	Details
06/2017-06/2019	Post-Doctoral associate, Department of Microbiology & Molecular Medicine, University of Geneva. Responsibility: Project management, Fund raising/Research grant, proposal submission, Training and Supervision of Master students, Lab management. PI: Dominique Soldati Favre. Research: Apicomplexan biology. PI: Dominique Soldati Favre. Research: Apicomplexan biology.
06/2015-06/2017	EMBO Post-Doctoral Fellow, Department of Microbiology & Molecular Medicine, University of Geneva. Responsibility: Project management, Fund raising/Research grant proposal submission, Lab management. PI: Dominique Soldati Favre. Research: Apicomplexan biology.
10/2014-03/2015	Post-Doctoral Associate, Department of Molecular Microbiology & Immunology, Johns Hopkins Bloomberg School of Public Health. Responsibility: Project Management, Experimental Research. PI: Jay Bream. Research: Immunoregulation in colitis.

### Research training (PhD or equivalent)

Dates (mm/yyyy)	Details
06/2009-07/2014	CSIR-Indian Institute of Chemical Biology (IICB), Department of Infectious Diseases. Supervisor: Syamal Roy. <i>Leishmania</i> drug resistance and Immunology.

### Education

Dates (mm/yyyy)	Details
08/2006-08/2008	MSc in Genetics, University of Calcutta. 1 <sup>st</sup> Class.
08/2003-08/2006	BSc in Zoology, University of Calcutta, 1 <sup>st</sup> Class.
08/2001-07/2003	12 <sup>th</sup> Standard. 1 <sup>st</sup> Class.
05/2001	10 <sup>th</sup> Standard. 1 <sup>st</sup> Class.

### Other relevant information

#### Mentorship:

- 2019- **Ph.D. supervisor**, the current strength of the lab, 5 Ph.D. students
- Undergraduate and Master's Thesis guided**  
IIT Kharagpur: Completed 7, Ongoing 2  
External (6/4 Months): Completed 8 External Universities across India. Details can be provided on request.
- Ph.D. scholar Supratim Pradhan was selected for prestigious Prime Minister Fellowship (PMRF) for his PhD Thesis.

4. Ph.D. scholar Shatarupa Bhattacharya received Best Poster Award in the 45th edition of the All-India Cell Biology Conference (AICBC), 2023, held in Banaras Hindu University (BHU), India.
5. Ph.D. scholar Souradeepa Ghosh received received MPM2023 Travel Award.
6. July 21<sup>st</sup>-July 28<sup>th</sup>, 2018: Module Instructor for Middle Eastern Biology of Parasitism (MeBOP), Bern, Switzerland.
7. 2017-2019: Master student mentoring for 2 months' internship and 1-year Master's project, University of Geneva, Switzerland.

#### Teaching Responsibility:

1. Vaccines and Immunity. Teaching Rating (TR): 4.8 out of 5
2. Fundamentals of biochemistry and cell biology. TR: 4.6 out of 5
3. Advanced immunology and immunotherapeutic. TR: 4.85 out of 5
4. Microbial genetics and genetic engineering. TR: 4.72 out of 5
5. Advances in genome engineering technologies (Designed and delivered). TR: 4.6 out of 5
6. Academic Advisor (2020-till date): Molecular Medical Microbiology (Master Course).

**Funding:** Total funding secured till date as independent PI: INR 37599715.4/-

**PI:** Identification and Characterization of Proteins Involved in Transmission Machinery of Protozoan Pathogens (IIT/SRIC/MM/CPI/2019-20/166, Rs **2800000**(04-11-2019 to 04-11-2022).

**PI:** Production of SARS-COV-2 c-DNA library with specific genome architecture of Indian Isolates for subsequent development of centralized In-House Repository of Recombinant Antigen and Antibody for COVID-19 related research, Instituted-OTG Project, Rs **600000** (30.07.20-30.04.21).

**PI:** Molecular & biochemical characterization of amastigote specific proteases involved in late-stage infection & dissemination of drug resistant & sensitive clinical *Leishmania donovani* isolates. **Start-up Research Grant (SRG), SERB, DST, Rs 2700000** (27.01.2021-26.03.2023).

**PI:** CRISPR-Cas based rapid diagnostics of Miltefosine susceptible and resistant strains of *Leishmania donovani* from asymptomatic and post kala azar dermal leishmaniasis using invasive and non-invasive approach. **ICMR, Rs 3100000** (25.02.22-24.02.24).

**Co-PI:** Comparative assessment of the neutralization efficacy of Indigenous vaccines against prevailing variants of concerns of SARS-CoV-2 circulating in India. **ICMR, Rs 4996307** (15.02.22-14.02.24)

**PI:** Unravelling differential metabolic regulation in drug-resistant and sensitive clinical *Leishmania donovani* (LD) isolates as a possible cause of altered immune metabolic phenotype in the infected host" approved under the extramural scheme of **ICMR-2021 Funding approved Rs 6440950** (2023-2026).

**Co-PI:** Community-Based Intervention to Address Antibiotic Resistance: An Embedded Mixed-Methods Interventional Study. **ICMR Rs 4516480** (2023-2026).

**Co-PI:** Mechanistic investigation of the complex inter-relationship between HbE/Betathalassemia and protozoan parasite infections with HLA association. **ICMR Rs 4654478.40** (2023-2026)

**PI:** Investigating a possible role of higher iron acquisition with rapid emergence of drug resistance in clinical isolates of *Leishmania donovani*. Scheme for Transformational and Advanced Research in Sciences (STARS), **Ministry of Education- Govt of India. Rs 7791500** (2023-2026)

#### Industrial Collaboration:

Working in collaboration with UCB Celltech (UK), a branch of UCB Pharma S.A & Medicines for Malaria. Funding secured 40,000 USD, from March 2017-December, 2018. PI: Dominique Soldati-Favre.

#### Scientific Outreach Activity:

1. Co-organised 2 days' workshop 'Basic Training on Molecular Biology Techniques under Rural Science Education Training Utility Program for College Teachers from Rural India, October 6<sup>th</sup>-7<sup>th</sup>, 2023.
2. Co-organised Rural Science Education Training Utility Program for school teachers from rural areas of West Bengal 2<sup>nd</sup> July, 2022.
3. Served as question paper setter and interview board member for Senior Science Talent Search Test (STST) for 12<sup>th</sup> Slandered students conducted by Jagadish Bose National Science Talent Search (JBNSTS) on 2022.
4. Served as Subject Expert Member of the interview board for selecting PGT-Biology for Kendriya Vidyalaya, Kharagpur Campus.
5. Delivered several scientific and popular lectures for School and University students from 2020 to popularize scientific research among them.
6. Member of The Society of Biological Chemists, India

#### Awards.

2022-2025-Selected Member of the Indian Young National Science Academy (INYNAS)

2022: Recipient of SERB International Research Experience (SIRE) fellowship by Science and Engineering Board, Govt of India.  
2018: Pfizer Research Award in the area of infectious diseases, rheumatology & immunology.  
2018: INSA Medal for Young Scientist.  
2015/2016: Swiss Government Excellence Scholarship (not obtained).  
2014/2015: EMBO Long Term European Fellowship.  
2014: Para Frap International Fellowship (not obtained).  
2009/2014: CSIR, India, National Eligibility Test (NET) PhD Fellowship

## Publications

### Primary research publications

#### Manuscripts in submission

1. Achinta Sannigrahi, *Souradeepa Ghosh*#, *Supratim Pradhan*#, Pulak Jana, Junaid Jibrán Jawed, Subrata Majumdar, Syamal Roy, Sanat Karmakar, ***Budhaditya Mukherjee***#, and Krishnananda Chattopadhyay\*. KMP-11 Facilitates Host Cell Invasion Through Cholesterol Transport and Membrane Phase Transition (under review).
2. Ghosh S#, Chigicherla KV#, Dasgupta S#, Goto Y and **Mukherjee B**#. (2024). Oxidative stress-driven enhanced iron production and scavenging through Ferroportin reorientation worsens anemia in antimony-resistant *Leishmania donovani* infection. bioRxiv.583250; doi: <https://doi.org/10.1101/2024.03.04.583250>

#### Publications arising from independent laboratory

1. *Pradhan S*#, *Snehlata*#, *Manna D*#, Karmakar S, Singh MK, Bhattacharya A, ***Mukherjee B***#, Paul J\*. (2022). Activation of TLR-pathway to induce host Th1 immune response against visceral leishmaniasis: Involvement of galactosylated-flavonoids. *Heliyon*, 8(7): e09868. DOI: 10.1016/j.heliyon.2022.e09868
2. *Ghosh S*#, *Biswas S*#, Mukherjee S, *Pal A*#, *Saxena A*#, Sundar S, Dujardin JC, Das S, Roy S, Mukhopadhyay R\*, ***Mukherjee B***#. (2021) A novel bioimpedance based detection of Miltefosine susceptibility among clinical *Leishmania donovani* isolates of the Indian subcontinent exhibiting resistance to multiple drugs. *Front Cell Infect Microbiol* 2021; 11: 768830. doi: 10.3389/fcimb.2021.768830.
3. Mukherjee S, *Pradhan S*#, *Ghosh S*#, Sundar S, Das S, ***Mukherjee B***#, Roy S\*. (2020). Short-Course Treatment with Imipramine Entrapped in Squalene Liposomes Results in Sterile Cure of Experimental Visceral Leishmaniasis Induced by Antimony Resistant *Leishmania donovani* with Increased Efficacy. *Front Cell Infect Microbiol* 10:595415. doi: 10.3389/fcimb.2020.595415

#### Publications arising from post-doctoral work

1. Gaëlle Lentini G, Ben Chaabene R, Vadas O, Ramakrishnan C, **Mukherjee B**, Mehta V, Lunghi M, Grossmann J, Maco B, Visentin R, Hehl AB, Korkhov VM, Soldati-Favre D. (2021) Structural insights into an atypical secretory pathway kinase crucial for *Toxoplasma gondii* invasion. *Nat Commun* 12(1):3788. doi: 10.1038/s41467-021-24083-y
2. **Budhaditya Mukherjee**, Francesca Tessaro, Juha Vahokoski, Inari Kursula, Jean-Baptiste Marq, Leonardo Scapozza and Dominique Soldati-Favre. (2018). Modeling and resistant alleles explain the selectivity of antimalarial compound 49c towards apicomplexan aspartyl proteases. *EMBO J*, doi: 10.15252/embj.201798047 37(7), e98047
3. Paco Pino, Reto Caldelari, **Budhaditya Mukherjee**, Juha Vahokoski, Natacha Klages, Bohumil Maco, Christine R. Collins, Michael J. Blackman, Inari Kursula, Volker Heussler, Mathieu Brochet and Dominique Soldati-Favre. (2017). A multi-stage antimalarial targets the plasmepsins IX and X essential for invasion and egress. *Science*, doi: 10.1126/science.aaf8675. 358(6362), 522-528.
4. Dogga SK, **Mukherjee B**, Jacot D, Kockmann T, Molino L, Hammoudi PM, Hartkoorn RC, Hehl AB, Soldati-Favre D. (2017). A drugable secretory protein maturase of *Toxoplasma* essential for invasion and egress. *Elife*, doi:10.7554/eLife.27480. 6. pii: e27480.

#### Publications arising from PhD work

1. **Mukherjee B**, Paul J, Mukherjee S, Mukhopadhyay R, Das S, Naskar K, Dujardin JC, Saha B, Roy S. (2015). Antimony-Resistant *Leishmania donovani* Exploits miR-466i To Deactivate Host MyD88 for Regulating IL-10/IL-12 Levels during Early Hours of Infection. *J. Immunol*, 195(6):2731-42.
2. Mukherjee S, **Mukherjee B**, Mukhopadhyay R, Naskar K, Sundar S, Jean C. Dujardin JC, Roy S. (2014). Imipramine exploits Histone deacetylase 11 to increase IL-12/IL-10 ratio in macrophages

infected with antimony resistant *Leishmania donovani* and clears organ parasite in experimental infection. *J. Immunol*, 193(8):4083-94.

3. **Mukherjee B**, Mukhopadhyay R, Bannerjee B, Chowdhury S, Mukherjee S, Naskar K, Allam US, Chakravorty D, Sundar S, Dujardin JC, Roy S. (2013). Antimony resistant *Leishmania donovani* upregulates IL-10 to overexpress host multi drug resistant protein1. *PNAS*, 110(7): E575-82.

4. Mukherjee S, **Mukherjee B**, Mukhopadhyay R, Naskar K, Sundar S, Dujardin JC, Das AK, Roy S. (2012). Imipramine is an Orally Active Drug against Both Antimony Sensitive and Antimony Resistant *Leishmania donovani* Clinical Isolates in Experimental Infection. *PLoS Negl Trop Dis*, 6(12): e1987.

5. Chowdhury S, Mukherjee T, Mukhopadhyay R, **Mukherjee B**, Sengupta S, Chattopadhyay S, Jaisankar P, Roy S, Majumder HK. (2012). The lignan niranthin poisons *Leishmania donovani* topoisomerase IB and favours a Th1 immune response in mice. *EMBO Mol Med*, 4(10): 1126-43.

6. Mukhopadhyay R, Mukherjee S, **Mukherjee B**, Naskar K, Mondal D, Decuypere S, Ostyn B, Prajapati VK, Sundar S, Dujardin JC, Roy S. (2011). Characterisation of antimony-resistant *Leishmania donovani* isolates: biochemical and biophysical studies and interaction with host cells. *Int J Parasitol*, 41(13-14):1311-21.

### Publications arising from other work

1. *Banerjee S#*, Majumder R, **Mukherjee B#**, Mandal M. Selective ADA2 inhibition for enhancing anti-tumor immune response in glioma: Insights from computational screening of flavonoid compounds. (2023) *Int J Biol Macromol*. 253(Pt 7):127453. doi: 10.1016/j.ijbiomac.2023.127453. Online ahead of print.

2. Rahaman M, *Bhattacharya S#*, Mukherjee G, **Mukherjee B#**, Chakravorty N. (2023). Full genomic sequence of the HLA-A\*02:01:01:241 allele identified by next-generation sequencing. *HLA*, 102(1):66-68. doi: 10.1111/tan.15004.

3. Das O, Kundu J, Ghosh A, Gautam A, *Ghosh S#*, Chakravorty M, Masid A, Gauri SS, Mitra D, Dutta M, **Mukherjee B#**, Sinha S, Bhaumik M. (2022). AUF-1 knockdown in mice undermines gut microbial butyrate-driven hypocholesterolemia through AUF-1-Dicer-1-mir-122 hierarchy. *Front Cell Infect Microbiol*. 12:1011386. doi: 10.3389/fcimb.2022.1011386.

4. Sharma N, Kashif M, Vigyasa Singh, Fontinha D, **Mukherjee B**, Kumar D, Singh S, Prudencio M, Agam P Singh AP, Rathi B. (2021). Novel Antiplasmodial Compounds Leveraged with Multistage Potency against the Parasite *Plasmodium falciparum*: In Vitro and In Vivo Evaluations and Pharmacokinetic Studies. *J Med Chem* 64(12):8666-8683. doi: 10.1021/acs.jmedchem.1c00659

5. Upadhyay C, Sharma N, Kumar S, Sharma PP, Fontinha D, Bhupender C, **Mukherjee B**, Kumar D, Miguel P, Singh A, Singh P. (2022). Synthesis of new analogs of morpholine and their antiplasmodial evaluation against human malaria parasite *Plasmodium falciparum*. *New J. Chem.*, 2022, 46, 250

### Other publications

Reviews, book chapters, non-scientific articles etc.

### Reviews

1. Goto Y, Ito T, *Ghosh S#*, **Mukherjee B#**. (2023). Access and utilization of host-derived iron by *Leishmania* parasites. *J Biochem*. mvad082. doi: 10.1093/jb/mvad082. Online ahead of print.

2. Susanta Kar, Albert Descoteaux, **Budhaditya Mukherjee**, Leonardo Nimrichter. (2022). Editorial: Emerging roles of extracellular vesicles in immunomodulation during host-pathogen interactions. DOI: 10.3389/fimmu.2022.958179

3. *Deepak K#*, Roy PK, Kola P, **Mukherjee B#**, Mandal M. (2022). An overview of kinin mediated events in cancer progression and therapeutic applications. *Biochim Biophys Acta Rev Cancer*, 1877(6):188807. doi: 10.1016/j.bbcan.2022.188807.

4. *Pradhan S#*, *Ghosh S#*, *Hussain S#*, Paul J, **Mukherjee B#** (2021). Linking membrane fluidity with defective antigen presentation in leishmaniasis. *Parasite Immunol* 43(7): e12835 doi: 10.1111/pim.12835.

5. **Mukherjee B#**, Mukherjee K, *Nanda P#*, Mukhopadhyay R, Ravichandiran V, Bhattacharyya SN, Roy S (2020). Probing the molecular mechanism of aggressive infection by antimony resistant *Leishmania donovani*. *Cytokine*.145:155245 doi: 10.1016/j.cyto.2020.155245.

### Book Chapter

COVID-19: Tackling Global Pandemic through Scientific and Social Tools, edited by Saptarshi Chatterjee, ELSEVIER, Contributed Chapter: Application of CRISPR based diagnostic tools in detecting SARS-CoV-2 infection by *Snehlata#*, *Korra Bhanu Teja#*, and **Budhaditya Mukherjee**. (2021)

**Book Edited**

Pathobiology of Parasitic Protozoa: Dynamics and Dimensions. Springer Nature, 2023.

Contributed Chapter: Elaborating the Role of Aspartyl Protease in Host Modulation and Invasion in Apicomplexan Parasites Plasmodium and Toxoplasma. *Shatarupa Bhattacharya*#, *Shazia Parveen*# and **Budhaditya Mukherjee**.

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