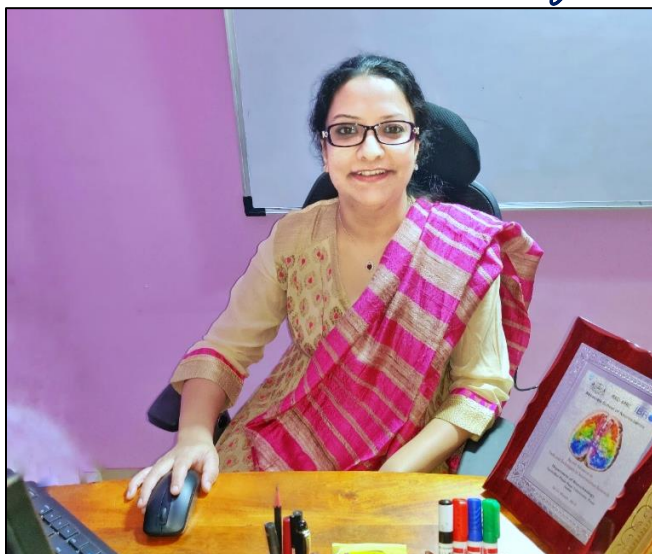


Dr. Tanushree Banerjee



Designation: Associate Professor,
Molecular Neuroscience Research Laboratory
Dr. D.Y. Patil Biotechnology & Bioinformatics Institute,
Dr. D.Y. Patil Vidyapeeth, Pune
Former DST-INSPIRE Faculty,
Department of Biotechnology, Savitribai Phule Pune University,
Pune

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Phone Number: 020-67919452

EDUCATIONAL QUALIFICATIONS:

Ph.D. in Biochemistry (2012) – National Institute of Immunology, Delhi
M.Sc. in Zoology (2006) – Hindu College, Delhi University – **First class with Distinction, ranked First (College topper)**
B.Sc. (Hons.) in Zoology (2004) – Hindu College, Delhi University – **First class, ranked Second (in College)**
Higher Secondary in Science (2001) – C.B.S.E board, Delhi Public School, Dhanbad – **First Class with Distinction**

POSTDOCTORAL TRAINING:

Research Associate (University of Pune) – 2011-2013

EMPLOYMENT EXPERIENCE:

DST-INSPIRE Faculty, Department of Biotechnology, Savitribai Phule Pune University, Pune (2013-2019)

Associate Professor, Dr. D.Y. Patil Biotechnology & Bioinformatics Institute, Dr. D.Y. Patil Vidyapeeth, Tathawade, Pune -411033 (2019 - Present)

FIELD OF SPECIALIZATION: Cell and Molecular Biology/Animal Tissue Culture/Molecular Neuroscience

Specific Areas of Research Interest:

1. Study on regulation of glucose metabolism in brain cells and its crosstalk with various factors
2. Interactome analysis of insulin regulation based on *in silico* modeling and microarray data analysis
3. Role of insulin resistance in neurodegenerative diseases
4. Development of rapid diagnostic kit for COVID-19 detection

AWARDS/HONOURS/MEMBERSHIP OF VARIOUS ACADEMIC BODIES:

Distinctions & Awards:

1. **Conferred “DST-INSPIRE Faculty” award in the year 2013 by Department of Science and Technology, Government of India**
2. **Innovation Ambassador of Ministry of Education’s Innovation Cell**, Expert Area: Design Thinking and Innovations
3. Life member of Indian Academy of Neurosciences
4. Life member of Indian Immunology Society
5. Qualified All India CSIR-UGC Junior Research Fellowship Examination, 2005 (Council for Scientific and Industrial Research, Ministry of Human Resource Development, Government of India)
6. M.Sc. final: Rank **1st** in Hindu College and **2nd** in Delhi University, India
7. M.Sc. previous: Rank **1st** in Delhi University, India
8. B.Sc: Rank **2nd** in Hindu College, Delhi University, India

Fellowships:

1. CSIR Junior & Senior Research Fellowships (2006-2011)
2. DST-INSPIRE Faculty Award (2013-2019)

Membership in Scientific Societies:

1. Life member of Indian Academy of Neurosciences, India
2. Life member of Indian Immunology Society, India

ACADEMIC ACTIVITIES:

Teaching & Research Experience:

1. **Teaching Research Associate** in Biotechnology, Department of Biotechnology, University of Pune (2 yrs.)
2. **DST-INSPIRE Faculty**, Department of Biotechnology, Savitribai Phule Pune University (> 5 yrs.)
3. **Associate Professor**, Dr. D.Y. Patil Biotechnology & Bioinformatics Institute, Dr. D.Y. Patil Vidyapeeth, Pune (> 2 yr.)
4. **Recognized Ph.D. Research Guide** in Biotechnology, at University of Pune till 2022 (>4 yrs.) and in Biotechnology at Dr. D.Y Patil Vidyapeeth, Pune
5. **Paper-setter and/or Examiner (B. Tech. & M. Tech. Integrated.)** for various graduate and post-graduate courses at Institute of Bioinformatics and Biotechnology, Savitribai Phule Pune University.

No. of Ph.D., Postdoctoral, M.Phil. /M.Sc. students Guided:

1. Ph. D. : 1 (in process)
2. M.Sc. (Project) : 9

No. of Funded Research Projects Completed and in Hand:

Sr. No.	Funding Agency	Duration
1.	DPU	2020-2022
2.	DST	2013-2019
3.	UGC ((Univ. of Pune; Co-PI)	2016-2018
4.	BCUD (Univ. of Pune)	2016-2018

RESEARCH PAPERS IN PEER REVIEWED JOURNALS:

1. Deshpande, M. and Banerjee, T*. A decoy strategy to activate the immune system (2021) *IUBMB life*, Accepted, Impact Factor: **3.244** * **Co-Corresponding Author**
2. Lokhande K. B., Banerjee, T. Swamy K. V., Ghosh, P and Deshpande, M. An *in silico* scientific basis for LL-37 as a therapeutic for Covid-19 (2021) *Proteins: Structure, Function, and Bioinformatics*, DOI: 10.1002/prot.26198, PMID: 34333809 Impact Factor: **3.756** [\[Pubmed\]](#)
3. Kiran Bharat Lokhande, Tanushree Banerjee, Kakumani Venkateswara Swamy, Payel Ghosh, Manisha Deshpande

4. Banerjee, T.* and Ghosh, A.* Nanotized Curcumin-Benzothioephene Conjugate: A Potential Combination for Treatment of Cerebral Malaria (2020) IUBMB life, **72**, 2637-2650, DOI: 10.1002/iub.2394 PMID: 33037778 Impact Factor: **3.514** *Corresponding Author [\[Pubmed\]](#)
5. Mishra, N., Lata, S., Deshmukh, P., Kamat, K., Surolia, A. & **Banerjee, T.*** Insulin signalling pathway protects neuronal cell lines by Sirt3 mediated IRS2 activation (2018) BioFactors, **44**, 224-236, DOI: 10.1002/biof.1413. PMID: 29411439 Impact Factor 3.236. *Corresponding Author Citations **5** [\[Pubmed\]](#)
6. Ghosh, A., **Banerjee, T.**, Bhandary, S. and Surolia, A. Formulation of nanotized curcumin and demonstration of its anti-malarial efficacy. (2014) International Journal of Nanomedicine, **9**, 5373-5387, DOI: 10.2147/IJN.S62756 PMID: 25484584 Impact Factor:**4.3** Citations **24** [\[Pubmed\]](#)
7. **Banerjee, T.**, Singh, R. R., Gupta, S., Surolia, N. and Surolia, A. 15-Deoxyspergualin Hinders Physical Interaction Between Basic Residues of Transit Peptide in PfENR and Hsp70-1 (2012) IUBMB life, **64**, 99-107, DOI: 10.1002/iub.583 PMID: 22223537 Impact Factor: **3.514** Citations **12** [\[Pubmed\]](#)
8. **Banerjee, T.**, Jaijyan, D. K., Surolia, N., Singh, A. P. and Surolia, A. Apicoplast Triose Phosphate Transporter gene knockout is lethal for *Plasmodium*. (2012) Molecular and Biochemical Parasitology, **186**, 44-50, DOI: 10.1016/j.molbiopara.2012.09.008 PMID: 23041242 Impact Factor: **2.738** Citations **18** [\[Pubmed\]](#)
9. Maity, K., **Banerjee, T.**, Prabakaran, N., Surolia, A. and Suguna, K. Effect of substrate binding loop mutations on the structure, kinetics and inhibition of Enoyl Acyl Carrier Protein Reductase from *Plasmodium falciparum* (2011) IUBMB life **63**, 30-41, DOI: 10.1002/iub.412 PMID: 21280175 Impact factor: **3.514** Citations **7** [\[Pubmed\]](#)
10. **Banerjee, T.**, Kumar, S. K., Kapoor, N., Vishnu, D., Surolia, N., and Surolia, A. Benzothioephene Carboxamides Derivatives as Inhibitors of Plasmodium falciparum Enoyl-ACP Reductase (2011) IUBMB life, **63**, 1101-1110, DOI: 10.1002/iub.553 PMID: 22006792 Impact Factor: **3.514** Citations **19** [\[Pubmed\]](#)
11. **Banerjee, T.**, Kapoor, N., Surolia, N., and Surolia, A. Benzothioephene Carboxamide Derivatives as Novel Anti-malarials (2011) IUBMB life **63**, 1111-1115, DOI: 10.1002/iub.543 PMID: 22038932 Impact Factor: **3.514** Citations **7** [\[Pubmed\]](#)
12. Kumar, G*, **Banerjee, T*.**, Kapoor, N., Surolia, N., and Surolia, A. SAR and Pharmacophore Models for the Rhodanine Inhibitors of *Plasmodium falciparum* Enoyl-Acyl Carrier Protein Reductase (2010) IUBMB life **62**, 203-210, DOI: 10.1002/iub.306 PMID: 20131353 Impact factor: **3.514** *Co-First Authors Citations **23** [\[Pubmed\]](#)
13. Kapoor, N., **Banerjee, T.**, Babu, P., Surolia, N., and Surolia, A. Design, Development, Docking Studies and Synthesis of 2'-Substituted Triclosan Analogs as Inhibitors for *Plasmodium*

falciparum Enoyl-ACP Reductase (2009) IUBMB life **61**, 1083-1091, DOI: 10.1002/iub.258 PMID: 19859979 Impact factor: **3.514** Citations **11** [\[Pubmed\]](#)

- 14. Banerjee, T.,** Sharma, S. K., Surolia, N., and Surolia, A. Epigallocatechin gallate is a slow-tight binding inhibitor of Enoyl-ACP Reductase from *Plasmodium falciparum* (2008) Biochem. Biophys. Res. Commun. **277**, 1238-1242, DOI: 10.1016/j.bbrc.2008.10.135 PMID: 18992222 Impact Factor: **2.523** Citations **12** [\[Pubmed\]](#)
- 15.** Kumar, G., Parasuraman, P., Sharma, S. K., **Banerjee, T.**, Karmodiya, K., Surolia, N., and Surolia, A. Discovery of Rhodanine class of compounds as inhibitors of *Plasmodium falciparum* Enoyl-ACP Reductase (2007) J. Med. Chem., **50**, 2665-2675, PMID: 17477517 DOI: 10.1021/jm061257w Impact Factor: **5.248**. Citations **95** [\[Pubmed\]](#)
- 16.** Pal, J.K. and **Banerjee, T.** (2012) Book review: Annual Review of Cell and Developmental Biology, 2011. Randy Schekman, Larry Goldstein and Ruth Lehman (eds). Annual Reviews Vol. 27. pp. xiii + 816. Curr. Sci. **102**, 1318-1319 [\[Current Science\]](#)
- 17.** Lokhande, K.B., **Banerjee T.**, Swamy, K.V., and Deshpande, M. An *in silico* scientific basis for LL-37 as a therapeutic and Vitamin D as preventive for Covid-19. 9th Sep 2020, Weblink: [\[ChemRxiv\]](#)

Patent:

- 1.Surolia A, **Banerjee T**, Surolia N, Kapoor N. Benzothiophene carboxamide compounds, composition and applications thereof. US 2012/0016014 A1; Jan 19, 2012

INVITED TALKS AT NATIONAL AND INTERNATIONAL CONFERENCES

- Chairperson of Scientific Session on Interdisciplinary Research at the conference conducted from 27th-29th October 2020, organized by Dr. D. Y. Patil Vidyapeeth.
- Invited symposium speaker in an International Neuroscience Conference “NEUROCON 2017” held on 19th -22nd January 2017, in Department of Biochemistry, ICARE Institute of Medical Science and Research (IIMSAR), Haldia, West Bengal, organized by IIMSAR.
- Invited symposium speaker in IBRO (International Brain Research Organization)-APRC School of Neuroscience on Recent Advances in Tools and Techniques in Neuroscience Research 26th – 31st March, 2018.

MEMBERS OF ORGANIZING COMMITTEE OF CONFERENCES

- Member of organizing committee of Dissertation Projects Webinar Series 2021, 2nd-5th December 2020 at Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Pune.

- Member of organizing committee of UNMESH 2020, Science Day, 27th-28th February 2020, Dr. D. Y. Patil Vidyapeeth, Pune
- Member of organizing committee of IBRO (International Brain Research Organization)-APRC School of Neuroscience on Recent Advances in Tools and Techniques in Neuroscience Research 26th – 31st March 2018.
- Part of Organizing Committee of National seminar on Current trends in Epigenetics organized by Department of Biotechnology, Savitribai Phule Pune University, Pune on 5th and 6th February 2016.
- Resource person for One Day National Seminar on Industry Academia Meet conducted by Department of Biotechnology, 14th May 2017

FACULTY DEVELOPMENT PROGRAMMES

- Undergone **Innovation Ambassador** training (Advanced Level) conducted by **MoE's Innovation Cell & AICTE** during the period from 30th June - 30th July 2021 in online mode
- Completed Internship in the area of “Bioinformatics, Genomics, and NGS data Analysis” organised by Nextgenhelper, New Delhi from June 19, 2021, to July 18, 2021.
- Attended 4-Week Induction/Orientation Programme for "Faculty in Universities/Colleges/Institutes of Higher Education organized by Teaching Learning Centre, Ramanujan College University of Delhi under the aegis of MHRD (Ministry of Human Resource Development), from 26th June-24th July 2020, Result: Grade **A+**.
- Attended 1-week International Online Faculty & Student Development Programme on “Translational and Interdisciplinary Research in Human Diseases Management” conducted under the aegis of MHRD-SPARC (Ministry of Human Resource Development- Scheme for Promotion of Academic & Research Collaborations), from 24th July-30th July 2020.
- Attended Science Leadership workshop by **INYAS** (Indian National Young Academy of Sciences) from 22nd June-28th June 2020, organized by Central University of Punjab.
- Attended IIC Online Sessions conducted by Institution's Innovation Council (IIC) of MHRD's Innovation Cell, New Delhi to promote Innovation, IPR, Entrepreneurship, and Start-ups among HEIs from 28th April to 22nd May 2020.

CURRENT RESEARCH

Cellular metabolism regulates both physiological and pathological conditions. Any disruption of metabolic pathway can lead to an imbalance in the physiological status of the cell which may further induce pathological conditions. Therefore, it is not only important to know the fine metabolic changes, but it is also extremely fascinating to understand the maintenance of the mechanism of the metabolic pathways. The metabolic pathways are

coexisting and codependent on each other. Therefore, a holistic approach to develop complete understanding of cellular metabolism is required.

During my PhD, I was trying to understand the significance of fatty acid biosynthesis in the malarial parasite, *Plasmodium falciparum*. Our group was working towards developing anti-malarials by targeting the fatty acid synthase pathway of the parasite. We realized that just by blocking this pathway we can prevent the growth of the parasite. Hence, the study on fatty acid synthesis of *Plasmodium* enthused me to understand the significance of metabolic pathways in other biological systems as well.

One of the most highly metabolically active cells of our body are the neurons. Neurons are constantly firing, transmitting signals and controlling all other functions of our body. They need constant supply of energy as well as need to synthesize proteins and fatty acids. Another, important aspect of neuronal metabolism is its need to modulate its signal transmission rate depending on body's state and requirement. These modulations happen at a tightly regulated mechanism and speed. Therefore, neurons depend on different metabolic pathways at different points of time for the same outcome, that is energy generation, synthesis of neuropeptides and fatty acids. It is extremely interesting to understand how neurons control these frequent switching of one metabolic pathway to another. Our laboratory is focusing on mechanisms which regulate these metabolic switches.

One major difference between neurons and any other cells of the body is that they rarely divide. Hence, they are called post-mitotic cells. This makes them unique in terms of metabolism and physiology. Therefore, another point of interest of our research group is to delineate the differences, if any, in metabolism of neurons when compared with other highly metabolically active cells of the body like cardiomyocytes, hepatocytes etc. Understanding these differences will help us to understand the specific points of intervention which are relevant majorly for neurons and will therefore help in neuron targeted therapy and contribute to alleviating neuronal pathologies.

Metabolic pathways are not stand-alone systems. They constantly crosstalk with other metabolic pathways. Any single disruption in a metabolic pathway might percolate its

effects through multiple other pathways. Cells have counterbalance systems which aim towards mitigating the effect of slight disruptions and try to maintain the homeostatic physiological conditions. However, when the disruption levels are high, and cells fail to maintain the physiological conditions and then the pathological conditions ensue. Neurodegenerative conditions are such pathological conditions which are unique to neurons. Most of the neurodegenerative diseases like Alzheimer's, Parkinson's even depression are multi-factorial disorders that are closely regulated by metabolic systems. To understand the pathophysiology associated with the increasing occurrence of neurological disorders is one more aspect where our group is currently focused.