Dr. AMRITA BANERJEE
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+91-7872168400

Official Address
Department of Biotechnology and Biochemistry
Oriental Institute of Science and Technology
Midnapore, Paschim Medinipur,
West Bengal -721102, India.

Permanent Address
Rabindrapally, Inda, Kharagpur
Paschim Medinipur
West Bengal 721305, India

CURRENT POSITION from 11th October 2017-till date

Assistant Professor (Contract) and U.G. Head
Dept. of Biotechnology
Oriental Institute of Science and Technology, Midnapore – 721 102

EDUCATION

Vidyasagar University 2012-2018
Ph.D. in Microbiology
Title: Relationships of Multiple Tannase Sequences and Structures through Bioinformatics

Vidyasagar University 2009-2012
Trainee Fellow and Student Fellow
DBT Sponsored Bioinformatics Infrastructure Facility Center, Dept. of Microbiology

Vidyasagar University 2006-2008
M.Sc., Microbiology with 69.83 % Marks

Vidyasagar University, Panskura Banamali College 2003-2006
B.Sc., Microbiology with 61.25 % Marks

RESEARCH EXPERIENCE

Oriental Institute of Science and Technology **2017-Present**
Different research activities during project supervision of B.Sc. and M.Sc. students.

Vidyasagar University **2012-2018**
PhD: Relationships of Multiple Tannase Sequences and Structures through Bioinformatics

Vidyasagar University **2009-2012**

"Student Fellow" and "Trainee Fellow"; Bioinformatics Infrastructure Facility (BIF) Centre, Department of Microbiology, Vidyasagar University, India

Indian Institute of Technology, Kharagpur, India **2008**

Summer training fellow on "**Bioavailability of Nutrient in Organic Amended Soil grown with Pea nut and Potato**" Under the guidance of Dr. Dillip Kumar Swain, Assistant Professor, Agriculture and Food Engineering Department, Indian Institute of Technology (IIT), Kharagpur, India.

HONOURS AND AWARDS

2014 Awarded **Senior Research Fellowship**, UGC-RFSMS (Research Fellowship in Science for Meritorious Students) Fellowship, University Grants Commission, New Delhi, India.

2012 Awarded **Junior Research Fellowship**, UGC-RFSMS (Research Fellowship in Science for Meritorious Students) Fellowship, University Grants Commission, New Delhi, India.

PUBLICATIONS

2020

- **Amrita Banerjee**, Dipannita Santra, Smarajit Maiti. "Energetics and IC50 based epitope screening in SARS CoV‑2 (COVID 19) spike protein by immunoinformatic analysis implicating for a suitable vaccine development". Journal of Translational Medicine. 2020.18:281-294.
- Smarajit Maiti, **Amrita Banerjee**. Epigallocatechin-Gallate and Theaflavin-Gallate Interaction in SARS CoV-2 Spike-Protein Central-Channel with Reference to the Hydroxychloroquine Interaction: Bioinformatics and Molecular Docking Study. Drug Development Research. 2020:1-11.

- Smarajit Maiti, **Amrita Banerjee**, Aarifa Nazmeen, Mehak Kanwar, Shilpa Das. Active-site Molecular docking of Nigellidine to nucleocapsid/Nsp2/Nsp3/MPro of COVID-19 and to human IL1R and TNFR1/2 may stop viral-growth/cytokine-flood, and the drug source Nigella sativa (black cumin) seeds show potent antioxidant role in experimental rats. Preprint. 2020. DOI: 10.21203/rs.3.rs-26464/v1.

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- Smarajit Maiti, **Amrita Banerjee**, Mehak Kanwar. In silico Nigellidine (N. sativa) bind to viral spike/active-sites of ACE1/2, AT1/2 to prevent COVID-19 induced vaso-tumult/vascular-damage/comorbidity. DOI: 10.22541/au.159421867.79066783.

- Krishanu Singha, Subhrajeet Sahoo, Arindam Roy, **Amrita Banerjee**, Keshab Chandra Mondal, Bikas Ranjan Pati and Pradeep Kumar Das Mohapatra. "Contributions of wild mushrooms in livelihood management of ethnic tribes in gurguripal, west bengal, india". International Journal of Pharmaceutical Sciences and Research. 2020. 11(7): 3160-3171.

2019

- Arindam Ganguly, **Amrita Banerjee (Equal First authorship),** Asish Mandal and Pradeep Kumar Das Mohapatra. Study of bile salt hydrolase in *Lysinibacillus sphaericus:* A potent fish probiotic and its *in silico* structure prediction for catalytic interaction. Romanian Archives of Microbiology and Immunology. 2019. 78(2): 81-90.
- Jyoti Prakash Soren, Tanmay Paul, **Amrita Banerjee**, Keshab Chandra Mondal, Pradeep Kumar Das Mohapatra. "Exploitation of Agricultural Waste as Sole Substrate for Production of Bacterial L-Glutaminase Under Submerged Fermentation and the Proficient Application of Fermented Hydrolysate as Growth Promoting Agent for Probiotic Organisms". Waste and Biomass Valorization. 2019. https://doi.org/10.1007/s12649-019-00761-3.

2018

- Arindam Ganguly, **Amrita Banerjee**, Asish Mandaland Pradeep K. Das Mohapatra**.** "Probiotic-based cultivation of *Clariasbatrachus*: importance and future perspective". **Acta Biologica Szegediensis**. 2018. 62(2):158-168.

- Arindam Ganguly, **Amrita Banerjee,** Asish Mandal, Tapas Kumar Dutta, Pradeep Kumar Das Mohapatra. Study of indigenous freshwater fish diversity of Bankura (West Bengal), India with special reference to *Clariasbatrachus.* **Journal of Applied and Natural Science**. 2018. 10(4): 1162-1172.

- Arindam Ganguly, **Amrita Banerjee,** Asish Mandal, Pradeep Kumar Das Mohapatra. "Optimization of effective dose of a newly isolated probiotic bacteria for growth and disease resistance of *Clariasbatrachus* (LINN.)". **Research journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences.** 2018**.** 4(4): 344-354.

- Riddha Mukherjee, Tanmay Paul, Suman Kumar Halder, Jyoti Prakash Soren, **Amrita Banerjee**, Keshab Chandra Mondal, Bikash Ranjan Pati, Pradeep Kumar Das Mohapatra. "Characterization of an acidophilic α-amylase from *Aspergillus niger*RBP7 and study of catalytic potential in response to nutritionally important heterogeneous compound". **Acta Biologica Szegediensis.** 2018. 62(1): 113-119.

- Arindam Ganguly, **Amrita Banerjee,** Asish Mandal, Mohammad Ali Khan, Pradeep Kumar Das Mohapatra. "Isolation and Characterization of Bacteria from the Intestine of Clariasbatrachus for Probiotic Organism". **Proc Zool Soc**. 2018. https://doi.org/10.1007/s12595-018-0283-x.

2017

- **Amrita Banerjee**, Krishanu Singha, Jyoti Prakash Soren, Arnab Sen, Keshab Chandra Mondal, Pradeep Kumar Das Mohapatra. "Evolutionary study and sequence structure relationship of fungal tannase and its subcellular localization through Bioinformatics". **Research journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences.** 2017. 3(2):71-83.
- Krishanu Singha, **Amrita Banerjee**, Bikas Ranjan Pati, Pradeep Kumar Das Mohapatra. "Eco-diversity, productivityand distribution frequency of mushroomsinGurguripalEco-forest,PaschimMedinipur,West Bengal,India". **Current Research in Environmental & Applied Mycology**. 2017.7(1):8-18.

2014

- **Amrita Banerjee**, Shilpee Pal, Tanmay Paul, Keshab C. Mondal, Bikas R. Pati, Arnab Sen and Pradeep K. Das Mohapatra. "Characterization of Bacillus anthracis Proteases through Protein-Protein Interaction: An In Silico Study of Anthrax Pathogenicity". TANG Humanitas Medicine.2014. 4(1):6.1-6.12.

- **Amrita Banerjee**, Dipak K. Sahoo, HrudayanathThatai, Bikas R. Pati, Keshab C. Mondal,Arnab Sen and Pradeep K. Das Mohapatra. "Structural Characterization and Active Site Predictionof Bacterial Keratinase through Molecular Docking". Journal of Bioinformatics. 2014. 1(4): 67-82.

- Arijit Jana, Suman Kumar Halder, **Amrita Banerjee**, Tanmay Paul, Bikas R. Pati, Keshab C.Mondal and Pradeep K. Das Mohapatra. "Biosynthesis, structural architecture and biotechnologicalpotential of bacterial tannase: A molecular advancement". Bioresource Technology. 2014.157:327-340.

- Shilpee Pal, **Amrita Banerjee**, Partha S. Das, Bikas R. Pati, Keshab C. Mondal, Biplab Chakraborty, Arnab Sen and Pradeep K. Das Mohapatra. "Dangue virus type-4 evolution andgenomics: A bioinformatics approach". Indian Journal of Biotechnology.2014.13:330-

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336.

2012

- **Amrita Banerjee**, Arijit Jana, Bikas R. Pati, Keshab C. Mondal and Pradeep K. Das Mohapatra."Characterization of Tannase Protein Sequences of Bacteria and Fungi: An In Silico Study". Protein Journal. 2012. 31: 306-327.

2011

- Prasenjit Barman, **Amrita Banerjee**, ParthaBandyopadhyay,Keshab Chandra Mondal, PradeepKumar Das Mohapatra. "Isolation, identification and molecular characterization of potentialprobiotic bacterium, Bacillus subtilis PPP 13 from Penaeus monodon". 2011. 1(4): 473-482.

** Another 7 paper has already been communicated in reputed journals. Among them one is **Corresponding Authorship**.

BOOK CHAPTER

- **Amrita Banerjee**, Krishanu Singha, Arnab Sen,Keshab Chandra Mondal, Pradeep Kumar Das Mohapatra. **2017**. "Studies on Diversity of Protein Sequence and Structure through Bioinformatics with Special Reference to Tannase". North Orissa University, Sriram Chandra Vihar,Takatpur, Baripada-757003. ISBN No.: 2319-5142.

- Krishanu Singha, **Amrita Banerjee,** Bikas Ranjan Pati, Pradeep Kumar Das Mohapatra**. 2017. "**Medicinal Potentials of Wild Mushrooms and Its Impact on Ethnic Tribes of Jungalmahal, Paschim Medinipur, West Bengal, India". North Orissa University, Sriram Chandra Vihar,Takatpur, Baripada-757003. ISBN No.: 2319-5142.

- *Krishanu Singha, Dipak Kumar Sahoo,* ***Amrita Banerjee*** *and Pradeep Kumar Das Mohapatra.* **2019***. "*Termitomyces Mushrooms: A Natural Resource of Biomolecules with Enormous Bioactive Potentials for Biotechnological Exploitation". Daya Publishing House®, A Division of Astral International Pvt. Ltd., New Delhi – 110 002. ISBN: 978-93-88982-00-9 (HB).

CONFERENCE PRESENTATION

Oral Presentations

- **"Study of Interrelationship between amino-acid sequence based and phylogeny and protein structure-based phylogeny of tannase for more detailed insight into tannin-tannase catalytic Interactions".** National Seminar on Biotechnology for sustainable utilisation of bioresources. 17th- 19thFebruary, 2017. Department of Biotechnology, North Orissa University.

- **"Comparative proteomics of tannase and feruloyl esterase: with special reference to enzyme catalysis",** in three days national level seminar on **Perspectives of Human Health, Microbial Biotechnology & Innovation.** 27th – 29th March, **2018**.Organized by Department of Microbiology, Vidyasagar University. (SELF)

- "**Microbial Tannase: Its biological effects on colorectal cancer",** inthenational seminaron Microbial Biotechnology (NSMB-2017). 10th and 11th March, **2017**. Organized by Dept. of Microbiology, Vidyasagar University. (SELF)

- "**Evolutionary study of fungal tannase and its subcellular localization through Bioinformatics"**, in the national seminar on **Microbiology in 21st Century.** 29th February–1st March, **2016**. Organized by Dept. of Microbiology, Vidyasagar University. (SELF)

- "**Prevention of Aquatic Vibriosis by probiotic *Lysinibacillus sphaericus:* A Bioinformatics Insight**", in International Research Conference on Recent Trends in Life Sciences. 28th - 29th November **2019**. Hosted and Organized by Department of Botany, Sidho Kanho Birsha University (SKBU), Purulia, West Bengal in association with International Academy of Science and Research (IASR), Kolkata.

Poster presentations

- "**Characterization of Tannase Protein Sequences of Bacteria and Fungi – an *In Silico* Study**", in the **International Conference on Frontiers in Biological Researches**. 26th and 27th Feb. 2012. Organized byDepartment of Human Physiology with Community Health, Vidyasagar University,Midnapore – 721 102.

- Presented a poster on **"Amino Acid Sequence Based PCR Strategy Development for Tannase Gene Identification from Different Source Organisms",** in the **International Conference on Current Trends in Biotechnology 2016.** 8th – 10thDec., 2016. Organized by The Biotech Research Society, India, at Vellore Institute ofTechnology.

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- Poster on "**Dengue Virus Type4 Evolution & Genomics: A Bioinformatics Approach**", in the **International Conference on Advances in Biotechnology and Bioinformatics.** 25th – 27th Nov., 2013. Organized by Biotech Research Society,India, at Pune.

- Poster on "***Corynebacterium urealyticum* DSM 7109 in renal disease: an *In Silico* evolutionary genomic analysis**", in the **International Conference on Emerging Trends in Biotechnology.** 6th – 9th Nov., 2014. Organized by Biotech ResearchSociety, India, at JNU, New Delhi.

- Poster on **"Enhanced production of alkaline protease by immobilized cells of *Bacillus anthracis* PTB12",** in the **International Conference on Emerging Trends in Biotechnology.** 6th – 9th Nov., 2014. Organized by Biotech ResearchSociety, India, at JNU, New Delhi.

- Presented a poster on **"Structure Validation and Active Site Prediction of Bacterial Keratinase through Molecular Docking**", in the DST sponsored nationalseminar on **New Horizons in Biotechnology.** 30th & 31st Aug., 2013. Organized byDept. of Biotechnology, Haldia Institute of Technology, Haldia, West Bengal.

- **Poster on "Enhanced production of alkaline protease by immobilized cells of *Bacillus anthracis* PTB12"** in International Conference on Emerging Trends in Biotechnology, XI Convention of The Biotech Research Society, India and Indo-Italian Workshop on Industrial Pharmaceutical Biotechnology - 2014. 6^{th} – 9^{th} November, 2014. Organised and Hosted by School of Environmental Sciences, Jawaharlal Nehru University, New Delhi and Biotech Research Society, India.

- Presented a poster on **"Protein sequence diversity study of Tannase through Bioinformatics",** in the national seminar on **Biodiversity Assessment and Wildlife Management.** 18th & 19th Mar., 2016. Organized by School of Wildlife and Remote Sensing, North Orissa University, Baripada, Orissa.

- Poster on "**A comparative production of L-glutaminase by *Acinetobacters* sp. PJB1 through submerged and solid state fermentation**", in the **International Conference on Current Trends in Biotechnology 2016.** 8th – 10^{th} Dec., 2016. Organized by The Biotech Research Society, India, at Vellore Institute of Technology.

- Poster on **"Sphingomyelin-based inhibition of Na, K transport protein of pathogen *Vibrio* sp.: A molecular docking study",** in the national symposium on Celebrating International Year of Periodic Table – 2019. 18th – 19th March 2019. Organized by Bankura Sammilani College in collaboration with Bankura University.

- Poster on "**Inhibition of aquaculture pathogen *Vibrio* sp. by signal peptides of probiotic bacteria *Lysinibacillus sphaericus:* A bioinformatics insight**", in the International Symposium on Microbial Technologies in 60th Annual Conference of Association of Microbiologists of India and Sustainable Development of Energy, Environment, Agriculture and Health – 2019. 15th – 18th November 2019. Organized by Central University of Haryana, Mahendergarh – 123031, Haryana, India.

Seminar Attended

- **"Structural Bioinformatics",** 8th & 9th October, 2007, Bioinformatics Infrastructure Facility Centre, Department of Microbiology, Vidyasagar University.

- "**Application of R in Bioinformatics**", 19th & 20th December, 2011. Bioinformatics Infrastructure Facility Centre, Department of Microbiology, Vidyasagar University.

- "**Current Trends of Biological Research at Crossroads of Science**". 17th – 23rd May, 2013. Bioinformatics Infrastructure Facility centre, Department of Microbiology, Vidyasagar University.

- **"Biological Networks & Systems Biology",** 8th & 9th August 2016. Bioinformatics Infrastructure Facility centre, Department of Microbiology, Vidyasagar University.

- National Seminar on **'Role of Microbes in Human Welfare'.** 29th Mar., 2005,Department of Microbiology, Vidyasagar University.

- National Seminar on **'Bio-medical Laboratory Science'** 17-19th Dec. 2005,Vidyasagar University of Health.

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- National Seminar on **'Microbes in Pharmaceuticals, Food &Agriculture'.** 20th &21st Dec., 2006, Organized by Dept. of Microbiology, Vidyasagar University.

- '**National Science Day 2007'. 2nd Mar., 2007.** Organized by **Department ofBiotechnology, IITKharagpur.**

- National Seminar on **'Natural Resources Development Strategies throughBiotechnological Approaches'. 23rd & 24th Mar., 2015.** Organized by Dept. ofAquaculture Management and Technology, Vidyasagar University.

- National Seminar on **'Research Methodology in Higher Education'. 19th Mar.,2013.** Organized by Vidyasagar University Research Scholars' Association,Vidyasagar University.

- UGC Sponsored Conference on '**Save Water and Energy: Save the Society',** 27thMar., 2014. Organized by Vidyasagar University.

- National Seminar on '**Biodiversity conservation and livelihood management in Similipal Biosphere reserve, Odisha'**. 29th-30thMarch, 2017. Centre for Similipal Studies, North Orissa University.

- One day Seminar cum Exhibition on '**Innovative Research in Science, Literature and Culture**'. 24th January, 2017. Vidyasagar University Research Scholar Association.

- One day Seminar and State level Poster Competition on '**Advancement in Biological Sciences'**. 23rd March 2013. Dept. of Microbiology and Dept. of Biotechnology, Panskura Banamali College, Panskura R. S., Purba Medinipur.

- A Special Lecture on '**Next Generation Sequencing: An Advance Technology**'. 26th November, 2012. Vidyasagar University Research Scholar Association.

TEACHING EXPERIENCE

PG in Biotechnology, Biochemistry and UG in Microbiology, Biotechnology from 11th October 2017 to till date

- Bioinformatics
- General Microbiology
- Ecology and Environmental Microbiology
- Food Chemistry, Microbiology and Toxicology
- Fermentation Technology and Rural Biotechnology
- Quality Control, Assurance and IPR
- Biochemistry and Metabolism
- Molecular Biology
- Immunology

At Department of Biotechnology, Oriental Institute of Science and Technology, Midnapore – 721 102

PROJECT GUIDESHIP

More than 8 PG Projects has been conducted.

TECHNICAL EXPERTISE

Microbiology:

- Bacterial and fungal culture.
- New bacterial strain isolation and characterization.
- Antibiotic sensitivity test through Minimum Inhibitory Concentration (MIC) Test.
- Zymogram.
- DGG
- Isolation and morphological with biochemical identification of new microbial strain from different environmental and enteric samples.
- Microbial identification through 16s and 18s rRNA gene amplification and analysis.
- Isolation of different industrially important enzyme producing microbes through selective medium.
- Production and optimization of different extracellular enzymes.
- Whole cell and enzyme immobilization.
- Antibiotic sensitivity and MIC test.
- Growth optimization
- Microbial consortium analysis

Molecular Biology:

- DNA and RNAisolationfrombacteria and fungi.
- Qualitative and quantitative analysis DNA and RNA.

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- Purification ofmRNAfromtotal RNA.
- PolymeraseChain Reaction (PCR), Reversetranscriptase-PCR(RT-PCR),genomicPCR
- Real-Time PCR.
- Gene cloning(Genomic,cDNA,TAcloningof PCR products and restrictioncloning)
- Rapid Amplification ofcDNA ends (RACE).
- Genome Walking.
- Chemical transformationand electroporation.

Protein biology:

- Protein extractions fromplant and bacterial sources.
- Over expression ofprotein in bacterial cells.
- Native and denaturingPAGE.

Microscopy:

- Bright field microscopy.

Bioinformatics:

- Nucleic acid and protein sequence analysis with Jellyfish version 3.3.1 and Sequencher 4.7 software.
- Pairwise and Multiple sequence analysis using CLUSTAL W2, CLUSTAL X2, MUSCLE, MAFFT, T-COFFEE, CLUSTAL OMEGA.
- Evolutionary phylogenetic analysis using PHYLIP-3.69, MEGA
- Phylogenetic tree representation using Dendroscope 3.5.9, Tree view X.
- Protein classification and physicochemical parameter analysis using Superfamily and Protparam tools
- Conserved domain, BLOCK and motif identification using Pfam, BLOCK-maker and MEME Suite.
- Protein tertiary structure prediction by homology modelling using Modeller -9.14, Swiss-model, Phyre2.
- Protein tertiary structure prediction by threading using I-TASSER server.
- Protein secondary structure prediction using Profunc.
- Protein tertiary structure analysis and alignment using Pymol, Discovery Studio 3.5 Clint visualizer, Rasmol, CN3D.
- Energy minimization of predicted protein structure using SPDBV 4.10 PC.
- Protein structural quality assessment using Profunc, Verify 3D, ERRAT2.

- Hydrophobicity and Surface accessibility to solvent using Discovery Studio 3.5 Clint visualizer
- Protein structure-based phylogeny using SALING server.
- Protein-Ligand and Protein-Protein docking using Autodock 1.5.6, Haddock, Patchdock.
- Protein-protein interaction study using STRING server.
- Simulation using GROMACS
- Genomic data analysis
- Whole genome-based GC, GC3 and Effective Number of Nucleotides (ENc), CAI, RSCU calculation by ACUA and Codon W.

Statistics:

- Simpson's index and Shannon's diversity index calculation.
- Correspondence analysis.
- Correlation coefficient, *t*-test and linear regression.

Others:

- Scientificproject writing and reporting; maintenanceof resources of scientific laboratory.
- Excellent oral & written communication and presentation skills, with ability to communicate confidently and build strong networks across the organization.

Personal Details

Date of Birth: September 27, 1985; **Gender:** Female; **Nationality:** Indian; **Marital status:** Married.

Declaration: I hereby declare that the information stated above is true to the best of my knowledge.

PLACE: KHARAGPUR ----------

DATE: (Dr. Amrita Banerjee)