

Samudra Prosad Banik

Designation: Assistant Professor (WBES), Department of Microbiology
Maulana Azad College, Kolkata, India



Educational Qualification: M.Sc. Ph.D.
UGC-NET (JRF), 2003

Phone: +91 9874490243

E-mail: samudrapb@gmail.com, samudraprosad.banik@maulanaazadcollegekolkata.ac.in

ORCID ID: <https://orcid.org/0000-0003-0075-7508>

Vidyan ID: <https://vidwan.inflibnet.ac.in/profile/418328>

Google Scholar metrics: h index- 11, i10 index – 13

About: Masters from the Department of Biophysics & Molecular Biology at the University of Calcutta in 2003 and thereafter Ph.D. in fungal biotechnology from CSIR-Indian Institute of Chemical Biology, Kolkata in 2009. The title of thesis was “Regulation of secretion of the sucrase-cellobiase coaggregate in secretory pathway of *Termitomyces clypeatus*. Recipient of travel grant from International Rice Research Institute, Philippines, Teaching specialization is biophysics and molecular biology.

Current Teaching: Course instructor for Biophysics (Thermodynamics and Spectroscopy), Protein chemistry (amino acids and their general reactions, protein structure) Molecular Biology (DNA structure and organization, Central Dogma, Replication and Transcription, Transposons, Phage biology and Phage Genetics, applications of recombinant DNA technology), Microbiology (Evolution of microbial genome, History of development of Microbiology, potability of water) and Immunology (Generation of immune response)

Present Research interests: a) Native and non-native aggregation of proteins in presence of small molecule osmolytes. b) Structural and functional consequences of protein glycation.

Ph.D. students mentored:

- 1) Ahana Das (awarded Ph.D. on the 26th of August, 2022 in Biochemistry from University of Calcutta). Title of thesis: “Studies on the effect of trehalose on secretion and stability of aggregation prone globular proteins”. Shodhganga link: <http://hdl.handle.net/10603/461466>

Research Grants:

2010- 2012: Principal Investigator “Isolation, partial purification, and characterization of cellulolytic enzymes from a lemon isolate of filamentous fungus” UGC (University Grants Commission) Minor Research Project, sanction no F.PSW-054/10-11 dt. 20.10.2010

2015-2018: Principal Investigator “Effect of trehalose on aggregation of fungal glycosidases” UGC Major Research Project F No. 43-69/2014 (SR) dated 23rd July, 2015

Administrative experience:

- Serving as Head, Department of Microbiology, Maulana Azad College from March, 2018 till date.
- Serving as a member of the Internal Quality Assurance Cell, Maulana Azad College since 2017.

Publications:

- 1) Pawan Kumar, **Samudra P. Banik**, Apurva Goel, Sanjoy Chakraborty, Manashi Bagchi & Debasis Bagchi (2023) A critical assessment of the whole plant-based phytotherapeutics from *Withania somnifera*(L.) Dunal with respect to safety and efficacy vis-a-vis leaf or root extract-based formulation, Toxicology Mechanisms and Methods, DOI: [10.1080/15376516.2023.2242933](https://doi.org/10.1080/15376516.2023.2242933)
- 2) Debasish Hota, Biswa M. Padhy, Rituparna Maiti, Debasis Bisoi, Jyoti Prakash Sahoo, Binod K. Patro, Pawan Kumar, Apurva Goel, **Samudra P. Banik**, Sanjoy Chakraborty, Mehul Rungta, Manashi Bagchi & Debasis Bagchi (2023) A Placebo-Controlled, Double-Blind Clinical Investigation to Evaluate the Efficacy of a Patented *Trigonella foenum-graecum* Seed Extract “Fenfuro®” in Type 2 Diabetics, Journal of the American Nutrition Association, DOI: [10.1080/27697061.2023.2233008](https://doi.org/10.1080/27697061.2023.2233008)
- 3) Pawan Kumar, **Samudra P. Banik**, Apurva Goel, Sanjoy Chakraborty, Manashi Bagchi & Debasis Bagchi (2023) Revisiting the Multifaceted Therapeutic Potential of Withaferin A (WA), a Novel Steroidal Lactone, W-ferinAmax (Ashwagandha), from *Withania Somnifera* (L) Dunal, Journal of the American Nutrition Association, DOI: [10.1080/27697061.2023.2228863](https://doi.org/10.1080/27697061.2023.2228863)
- 4) **Banik SP** Glycation-induced Amyloid Formation in Proteins: An Emerging Perspective to Explore Diabetes Associated Onset of Neurodegenerative Symptoms, Current Nutrition & Food Science 2023; 19(). <https://dx.doi.org/10.2174/1573401319666230224094812>
- 5) Kumar P., **Banik S. P.**, Goel A., Chakraborty S., Bagchi M. Bagchi D. Chemical, microbial and safety profiling of a standardized *Withania somnifera* (Ashwagandha) extract and Withaferin A, a potent novel phytotherapeutic of the millennium. Functional Foods in Health and Disease 2023; 13(2): 36-51. DOI: <https://www.doi.org/10.31989/ffhd.v13i2.1071>
- 6) Bagchi D, Downs BW, **Banik SP**, Chakraborty TR, Chakraborty S, Kushner S. Inflammatory responses and obesity: Nutrition as an epigenetic modulator. Am J Biopharm Pharm Sci 2022;2:9. doi: [10.25259/AJBPS_14_2022](https://doi.org/10.25259/AJBPS_14_2022)
- 7) Downs BW, **Banik SP**, Bagchi M, Morrison BS, Piacentino M, Kushner SW, et al. Assessment of a Novel Bioflavonoids and Phytonutrient Formulation in Enhancing Cellular Aerobic Glycolysis, Immunity, Sports Performance, and Mitigating Inflammation. Am J Biopharm Pharm Sci 2021;1:4.
- 8) Downs BW, **Banik SP**, Bagchi M, Morrison BS, Piacentino M, Kushner SW, et al. Design of a Novel Bioflavonoid and Phytonutrient Enriched Formulation in Boosting Immune

Competence and Sports Performance: A product Development Investigation. Am J Biopharm Pharm Sci 2021;1:2.

- 9) Sankhwar P, Jaiswar SP, Yadav S, Awasthi V, Goel A, Kumar P, **Banik SP**, Bagchi M, Bagchi D. Beneficial Effects of a Novel Fenugreek Seed Extract (*Trigonella foenum-graecum*, Furocyst®) in Women with Polycystic Ovary Syndrome (PCOS): A Follow-up Compliance Clinical Investigation. J Am Nutr Assoc. 2022 Nov 28;1-9. doi: 10.1080/27697061.2022.2145526.
- 10) Singh A., Gainer S., Banerjee P., Goel A., Kumar P., Mondal, B., **Banik S.P.** & Bagchi D. (2022) Efficacy of a Proprietary Fenugreek Seed Extract (*Trigonella foenum-graecum*, Furocyst®) in Women with Polycystic Ovary Syndrome (PCOS): a Randomized, Double-Blind, Placebo-Controlled Study, Journal of the American Nutrition Association, DOI: 10.1080/27697061.2022.2126410
- 11) Bagchi D., Downs B.W., **Banik S.P.**, Bagchi M., Kushner S., Chakraborty S., Morrison B.S., Hesson S. Effective Body Recomposition vs. Misconceptions of the Traditional Weight Loss Strategies: TRCAP21 -A Novel Technological Breakthrough in Body Recomposition. Functional Foods in Health and Disease 2022; 12(4): 134-150.
- 12) Ghosh R, **Banik SP.** (2022) Protective effect of Indomethacin on Vanadium-Induced Adrenocortical and Testicular damages in Rat. Toxicol Mech Methods. 32(2):114-122 doi: 10.1080/15376516.2021.1973169. Epub ahead of print. PMID: 34431458.
- 13) **Banik, S. P.**, Ghosh, R. B., Downs, B. W., Chakraborty, S., Chakraborty, S., Bagchi, M., Chakraborty, T. R., & Bagchi, D. (2021). Functional Foods Beyond Nutrition: Therapeutic Interventions to Combat COVID-19 and Other Viral Diseases. Journal of Food Bioactives, 15.
- 14) Das, A., Basak, P., Pramanik, A., Majumder, R., Ghosh, A., Hazra, S., Guria, M., Bhattacharyya, M., & **Banik SP.** (2020). Ribosylation induced structural changes in Bovine Serum Albumin: understanding high dietary sugar induced protein aggregation and amyloid formation. *Heliyon*, 6(9), e05053.
- 15) Das A, Basak P, Pramanick A, Majumder R, Pal D, Ghosh A, Guria M, Bhattacharyya M, **Banik SP.** (2019) Trehalose mediated stabilization of cellobiase aggregates from the filamentous fungus *Penicillium chrysogenum*, International Journal of Biological Macromolecules, 127: 365-375.
- 16) Das A, Basak P, Pattanayak R, Kar,T, Majumder, R., Pal, D, Bhattacharya A, Bhattacharyya, M., **Banik SP.** (2017) Trehalose induced structural modulation of Bovine Serum Albumin at ambient temperature, International Journal of Biological Macromolecules 105(1): 645-655.
- 17) Chowdhury S, **Banik SP**, Majumder R, Ghorai S, Pal S, Basak P, Khowala S (2017) Prevention of protein aggregation by extracellular fungal sucrase of *Termitomyces clypeatus* Turkish Journal of Biochemistry 42(3), pp. 355-364.
- 18) Majumder R, **Banik, SP**, Khowala, S. (2016) AkP from mushroom *Termitomyces clypeatus* is a proteoglycan specific protease with apoptotic effect on HepG2. International Journal of Biological Macromolecules. 91:198-207.
- 19) Majumder R, **Banik SP**, Khowala S (2015) Purification and characterization of a novel k-casein specific milk-clotting metalloprotease from *Termitomyces clypeatus* MTCC 5091. Food Chemistry 173: 441-448.

- 20) **Banik SP**, Mukherjee S, Pal S, Ghorai S, Majumder R, Khowala S (2015) Enhancement of extracellular cellobiase activity by reducing agents in the filamentous fungus *Termitomyces clypeatus*. *Biotechnology Letters* 37:175-181.
- 21) Majumder R, **Banik SP**, Khowala S (2014) Bioremediation by alkaline protease (AkP) from edible mushroom *Termitomyces clypeatus*: Optimization approach based on statistical design and characterization for diverse applications. *Journal of Chemical Technology and Biotechnology* 90: 1886-1896.
- 22) **Banik SP**, Bhattacharyya S, Ghorai S (2014) Isolation of a new *Penicillium chrysogenum* strain BF02 from agricultural soil of rural India producing a thermostable low Km cellobiase. *Journal of Microbiology, Biotechnology and Food Sciences* 3: 322-328.
- 23) Pal S, **Banik SP**, Khowala S. (2013) Mustard stalk and straw: a new source for production of lignocellulolytic enzymes by the fungus *Termitomyces clypeatus* and as a substrate for saccharification. *Industrial Crops and Products* 41: 283– 288.
- 24) **Banik SP**, Pal S, Ghorai S, Chowdhury S, Majumder R, Mukherjee S, Khowala S. (2012) *In situ* reversible aggregation of extracellular cellobiase in the filamentous fungus *Termitomyces clypeatus* *Biotechnology and Bioprocess Engineering* 17: 925-936. IF 1.278 (2012).
- 25) **Banik SP**, Pal S, Chowdhury S, Ghorai S, Khowala S. (2011) Evidence of an Alternative Route of Cellobiase Secretion in the Presence of Brefeldin A in the Filamentous Fungus *Termitomyces clypeatus* *Journal of Microbiology and Biotechnology* 21: 392–400.
- 26) Pal S, **Banik SP**, Ghorai S, Chowdhury S, Khowala S. (2011) Increased enzyme secretion by 2-deoxy-D-glucose in presence of succinate by suppression of metabolic enzymes in *Termitomyces clypeatus* *Carbohydrate Research*, 346: 2426-2431.
- 27) **Banik SP**, Pal S, Ghorai S, Majumder R, Mukherjee S, Chowdhury S Khowala (2011) Comparative elucidation of properties of sucrase-cellobiase co-aggregate produced in media containing sucrose by *Termitomyces clypeatus* *Indian Journal of Biotechnology* 10: 468-479.
- 28) Ghorai S, Pal S, Chowdhury S, **Banik SP**, Khowala S. (2010) Enhanced activity and stability of cellobiase (β -glucosidase:EC 3.2.1.21) produced in presence of 2-deoxy D-glucose from the fungus *Termitomyces clypeatus*, *Carbohydrate Research* 345: 1015-1022.
- 29) Pal S, **Banik SP**, Ghorai S, Chowdhury S, Khowala S. (2010) Purification and characterization of a thermostable intra-cellular β -glucosidase with transglycosylation properties from filamentous fungus *Termitomyces clypeatus* *Bioresource Technology* 101: 2412–2420.
- 30) **Banik SP**, Pal S, Ghorai S, Chowdhury S, Khowala S. (2009). Interference of sugars in the Coomassie blue G dye binding assay of proteins. *Analytical Biochemistry* 386: 113–115.
- 31) Ghorai S, **Banik SP**, Verma D, Chowdhury S, Mukherjee S, Khowala S. (2009) Fungal biotechnology in food and feed processing. *Food Research International* 42: 577-587.
- 32) Chowdhury S, Ghorai S, **Banik SP**, Pal S, Basak S, Khowala S. (2009) Characterization of a novel low molecular weight sucrase from filamentous fungus *Termitomyces clypeatus* *Process Biochemistry* 44: 1075-1082.

Chapters in books:

1. D. Bagchi, B. W. Downs, M. Bagchi, **S. P. Banik**, S. Kushner, B. Morrison, ... S. Hesson, in Dietary Supplements with Antioxidant Activity Understanding Mechanisms and Potential Health Benefits, ed. C. Alasalvar, F. Shahidi, and C. Ho, The Royal Society of Chemistry, <https://doi.org/10.1039/BK9781839166112-00130>
2. Bernard William Downs, **Samudra Prosad Banik**, Manashi Bagchi, Sanjoy Chakraborty, Steve Kushner, Jaclyn M. Downs, Debasis Bagchi, Chapter 6 - Primary factors that determine the severity of various infections and effective nutraceutical intervention strategies, Editor(s): Debasis Bagchi, Amitava Das, Bernard William Downs, Viral, Parasitic, Bacterial, and Fungal Infections, Academic Press, 2023, Pages 63-72, ISBN 9780323857307, <https://doi.org/10.1016/B978-0-323-85730-7.00038-2>
3. **Samudra Prosad Banik**, Maitree Bhattacharyya, Rituparna Ghosh, Tanima Chatterjee, Pijush Basak, Chapter 25 - Unveiling the prevalence and impact of diabetes on COVID-19, Editor(s): Debasis Bagchi, Amitava Das, Bernard William Downs, Viral, Parasitic, Bacterial, and Fungal Infections, Academic Press, 2023, Pages 287-301, ISBN 9780323857307, <https://doi.org/10.1016/B978-0-323-85730-7.00045-X>.
4. **Banik SP**, Sehgal S, Banik Ghosh R, Das A (2022) Impact of the gut microbiome on human health and diseases. In Bagchi D, Downs BW. Microbiome, Immunity, Digestive Health and Nutrition: Epidemiology, Pathophysiology, Prevention and Treatment, Academic Press, Pages 25-40, ISBN 9780128222386
5. Downs BW, **Banik SP**, Bagchi M, Banik Ghosh R, Kushner S and Bagchi D (2022) The microbiome, immunity, anaerobism, and inflammatory conditions: a multifaceted systems biology intervention. In Bagchi D, Downs BW. Microbiome, Immunity, Digestive Health and Nutrition: Epidemiology, Pathophysiology, Prevention and Treatment, Academic Press, Pages 205-216.
6. Bagchi D, **Banik SP** and Downs BW (2022) A treatise on a healthy microbiome: contribution to human health and disease prevention In Bagchi D, Downs BW. Microbiome, Immunity, Digestive Health and Nutrition: Epidemiology, Pathophysiology, Prevention and Treatment, Academic Press, Pages 497-501.
7. Sehgal S, Saji H, **Banik SP**. (2021) Role of food structure in digestion and health, In. Bagchi D, Ohia SE Nutrition and Functional Foods in Boosting Digestion, Metabolism and Immune Health Academic Press, Pages 151-165, ISBN 9780128212325
8. Paul, M. Pandey N., Shroti G., Tomar P., Thatoi H., Bhattacharya D., **Banik SP**, Ghosh D, Hazra S (2021). Enzyme-Nanoparticle Corona: A Novel Approach, Their Plausible Applications and Challenges. In: Thatoi, H., Mohapatra, S., Das, S.K. (eds) Bioprospecting of Enzymes in Industry, Healthcare and Sustainable Environment. Springer, Singapore. https://doi.org/10.1007/978-981-33-4195-1_9
9. Ghosh R, Das A, Bandyopadhyay A, Majumder R, **Banik SP** (2020) Vanadium Toxicity Revisited: Striking the Right Balance between Potential New Generation Therapeutics and

- Adverse Side Effects. In. Bagchi D, Bagchi M. Metal Toxicology Handbook, CRC Press, pp Boca Raton, Florida
10. **Banik SP**, Bhattacharyya M, Ghosh R, Majumder R (2020) Glycation-induced protein aggregation and cellular toxicity: an insight into the disease realm of high dietary sugar intake, In. Preuss HG, Bagchi D. Dietary Sugar, Salt and Fat in Human Health, pp 251-275 Academic Press, Cambridge
 11. Ghosh R, **Banik SP** (2016) Dual Effects of Vanadium: Toxicity Analysis in Developing Therapeutic Lead-Ups. Food Toxicology In. Bagchi D, Swaroop A & Stohs SJ pp 337-354. CRC Press, Boca Raton, Florida
 12. **Banik SP**, Khowala S, Pal, Mukherjee S. (2015) Proteomic approaches to identify novel therapeutics and nutraceuticals from filamentous fungi: Prospects and Challenges. In: Bagchi D, Swaroop A, Bagchi M editors. Genomics, proteomics and metabolomics in nutraceuticals & functional foods (2nd Edition) pp. 265-295, Wiley Blackwell. New Jersey.
 13. Ghorai S, **Banik SP**, Verma D, Chowdhury S, Mukherjee S, Khowala S (2011) Food Ingredients | Fungal Biotechnology in Food and Feed Processing. In: Murray Moo-Young (ed.), Comprehensive Biotechnology, Second Edition, Vol 3, pp. 603-615. Elsevier.
 14. Khowala S, Verma D, **Banik SP** (2009) Carbohydrates in an e book Biomolecules – Introduction Structure and Function in National Science Digital Library (NSDL) <http://nsdl.niscair.res.in/handle/123456789/802>.

Invited talks:

1. Delivered an invited lecture on “In silico tools to predict structure and function of proteins” in the State Level Seminar organized by the Department of Physiology in Association with IQAC, Raja Peary Mohan College, Uttarpara, Hooghly on 13th May, 2023.
2. Delivered an online lecture as a resource person in the online regional workshop of Erasmus Plus RISHI Project on the topic “Profiles of Global Professionals and citizens” organized by Adamas University, Kolkata on the 10th of May, 2022.
3. Delivered an online lecture as a resource person in DISHA-2021 [an initiative for Awareness, Scope and avenue of Undergraduate General Degree Course for 12(+) students, organized by ABN Seal College, Cooch Behar on 27th June, 2021.
4. A popular lecture on “Fun with Biotechnology: Why on earth should we know and study it?” delivered in the one day State level Biotechnology webinar organized by Jagadis Bose National Science Talent Search, Kolkata on 12th March, 2021.
5. Research work entitled “Trehalose mediated stabilization of cellobiase aggregates from filamentous fungi – A cross-linking independent approach to improve cellulolytic enzyme efficiency” presented at the two day National Conference on Science and Technology: Rural Development organized by ISCA, 2020, Kolkata Chapter, Surendranath College, Kolkata on 20th-21st January, 2020.

6. A popular lecture on “Recombinant DNA Technology: Accelerated Biotechnology” delivered in the one-day Biotechnology workshop at Jagadis Bose National Science Talent Search, Kolkata on 25th September, 2018.

Oral presentations

1. Research work entitled “Advanced glycation end products (AGEs) as harbingers of cellular toxicity: Implications in diabetes, obesity and neurological disorders” presented at the 4 day International conference and exhibition on nutraceuticals and functional foods 2021 organized by International Society of Nutraceuticals and Functional Foods in collaboration with Jiangsu Academy of Agricultural Sciences, China on 17th-20th October, 2021. Session: Obesity and Metabolic Syndrome: Role of Nutraceuticals and Functional Foods
<https://w.jaas.ac.cn/upload/isnff/session-15.mp4>
2. Delivered an oral presentation entitled “Stabilization Of Extracellular Fungal Cellobiase By Trehalose: A Cross-linker Free Approach To Prevent Spontaneous Dissociation Of Big Cellulolytic Enzyme Assemblies” attended the 7th International E-Conference on "Challenges And Opportunities in Medical, Environmental and Biotechnological Research": GenoPro2020 held on 10th -11th December, 2020 at Invertis University, Bareilly.
3. Delivered an oral presentation entitled “Ribosylation induced Non-canonical amyloid formation in Bovine Serum Albumin: Insights into glycation mediated protein aggregation” under the theme “Frontier Area of Research-Life Sciences” in the Young Scientists’ conference organized during 22nd December, 2020 to 24th December, 2020 as a part of India International Science Festival, 2020 organized by Ministry of Science and Technology, Govt. of India.

Other information:

- Life member of Biotech Research Society of India.
- Life Member of Microbiologists Society, India.

I declare that all informations given above are true to the very best of my knowledge.



Samudra Prasad Behera