Curriculum Vitae

Name: Dr. Anindya Sundar Ghosh
Designation: Professor
Institution: Department of Biosciences and Biotechnology, Indian Institute of Technology Kharagpur, Kharagpur-721302, WB, INDIA
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➢ Education:

Sl.#	Institution	Degree Awarded/ training	Year	Award/Prize/Certificate
1.	Bose Institute under Calcutta University	Ph. D. in Science in Physiology and Thesis was in antimicrobial chemotherapy entitled ***"Beta-lactam antibiotic resistance in Shigella"***	1999	NA
2.	Calcutta University	M. Sc. in Physiology with specialization in Immunology and Microbiology	1992	First Class
3.	Calcutta University	B. Sc. (Hons.) in Physiology with Chemistry, Zoology and English as subsidiary subjects	1990	First Class [Received National Scholarship from Govt. of India-1990]

➢ Position and Honors

Sl No.	Institution Place	Position	From (Date)	To (date)
1.	Dept. of Biotechnology, IIT Kharagpur, WB, INDIA	Professor	Feb.2018	continuing
2.	Dept. of Biotechnology, IIT Kharagpur, WB, INDIA	Associate Professor	Nov. 2011	Feb. 2018
3.	Dept. of Biotechnology, IIT Kharagpur, WB, INDIA	Assistant Professor	Oct. 2004	Nov. 2011
4.	Department of Microbiology and Immunology, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND-58202-9037, USA	Postdoctoral Research Associate	May 2001	Oct. 2004
5.	Institute of Environmental studies and Wetland Management	Microbiologist (R & D)	Dec. 2000	Apr. 2001
6.	Department of Physiology, Universal College of Medical Sciences, Bharahawa, Nepal.	Tutor and Assistant Professor	Feb. 1998	Mar. 2000

- **Honours/Awards:**

  - **Fellow (Elected): Royal Society of Biology, UK (2024)**
  - **Fellow (Elected): West Bengal Academy of Science and Technology (2019) - *Medical & Veterinary sciences* [Field: Antimicrobial Chemotherapy & Molecular Microbiology]**
  - **Awards:**

1)National Scholarship: Scholarship for securing high position in the list of meritorious candidates under the **National Scholarship** Scheme of Govt. of India for the Bachelor's Degree (Honours) Examination from the Calcutta University in the year **1990**.
2) **UNESCO-ASM Travel Award - 2006** from American Society for Microbiology.
3) **Visiting faculty (June- July, 2006)** at the University Of North Dakota School Of Medical Sciences, Grand Forks, ND, USA.
4) **IUMS Fellowship award-2009**fromInternational Unions of Microbiological Societies (IUMS)
5) **Visiting Faculty:** (May-June, 2010), Indiana University, Bloomington, IN, USA
6) **S. Mukherjee Memorial Oration Award (2013)** from Physiological Society of India (PSI))
7) **Fellowship Award:** DUO-INDIA-2020 (Professors), **(2019)** ASEM and SPARC (MHRD, Ind)
8) **Honorary Research Fellow:** Birkbeck University of London, London, UK **(2022)**

- **Broad areas of research interest:**

  I. ***Physiology of DD-carboxypeptidases***
  II. ***Antibiotic resistance (beta-lactamases & efflux-pump proteins)***
  III. ***Biofilm formation***

- **Research statement:** *Penicillin-interactive enzymes (PIEs) include penicillin-binding proteins (PBPs) and beta-lactamases (BLAs). PBPs catalyze the synthesis and remodeling of peptidoglycan (PG). We focus on PG-remodeling enzymes, DD-carboxypeptidases (DD-CPases), encoded by dacA, dacC, dacD and ampH. The characteristic features of DD-CPases are maintaining cell shape and intrinsic beta-lactam resistance, though there are inter and intra species variations in their physiological activities. Therefore, we intend to categorize DD-CPases thoroughly based on their physiological and biochemical functions in Escherichia coli, Klebsiella pneumoniae, Acinetobacter baumannii, Mycobaterium smegmatis and Mycobaterium tuberculosis. Moreover, we intend to find whether these DD-CPases have any other roles, namely, in evading immunological response, biofilm formation, antibiotic resistance, etc. As PBPs and BLA share common ancestry, through specific mutational analyses, we aim to know whether their activities are linked and identify the exact point of divergence of these two enzymes. Furthermore, we intend to probe the physiology of BLAs in bacterial cells apart from their roles in cleaving beta-lactams. Various types of BLAs, like TEM1, OXA, ESBL, Metallo-beta lactamases (MBL) and AmpC have a different spectrum of activity. Some of them are intrinsically expressed while the others need induction for proper expression. We are involved in studying the pathway of induction of these enzymes, which can be exploited to design future antimicrobial agents. We are also involved in identifying the genes related to biofilm formation in E. coli, K. pneumoniae, A. baumannii and M. smegmatis using molecular genetics techniques. Furthermore, we are engaged in characterizing several putative efflux-pump proteins in search of efflux–pump inhibitors for designing combination therapy and intend to correlate biofilm formation with efflux-pump proteins, or BLAs or any other factors, which can lead to multi-drug resistance phenotypes. In addition, we design and validate effective antibiotic combinations and diagnostic tools for BLA detection.*

- **Research Guidance:**

- **I. Ph.D. thesis (total-20): Degree Awarded: 15** & ongoing supervision**: 07**
- **II. M. Tech. thesis (total - 43): Degree Awarded: 46** & ongoing supervision: **02**
- **III. B. Tech. Thesis (total -52): Degree Awarded: 51**
  - **Details of the Ph.D. thesis awarded:**

Sl	Level	Title of Thesis	Name of Students	Co-Guide	Year of Award
1	**Ph.D.**	Understanding the behaviours of soluble penicillin-binding proteins 5 and 6 in *Escherichia coli*	**Chiranjit Chowdhury**	None	**2010**
2	**Ph.D.**	Role of auxiliary membrane components in beta-lactam antibiotic sensitivity of *E. coli*	**Sujoy K. Sarkar**	None	**2011**
3	**Ph.D.**	Effects of auxiliary membrane components on biofilm formation in *Escherichia coli*	**Akash Kumar**	None	**2014**
4	**Ph.D.**	Molecular characterization of D, D-carboxypeptidase homologues of *Klebsiella pneumoniae*	**Mouparna Dutta**	None	**2015**
5	**Ph.D.**	Physiological characterization of Low-molecular-mass penicillin interactive enzymes of *Mycobacteria*	**Ankita Bansal**	None	**2016**
6	**Ph.D.**	An insight into antibacterial resistance emphasizing beta-lactamase induction and its physiological impact in *Escherichia coli*	**Dhriti Mallik**	None	**2017**
7	**Ph.D.**	Molecular characterization of DD-carboxypeptidases of *Escherichia coli* and *Klebsiella pneumoniae* through mutation analysis	**Debasish Kar**	None	**2017**
8	**Ph.D.**	Molecular characterization of beta-lactamases in *Klebsiella pneumoniae*	**Gaurav Kumar**	None	**2018**
9	**Ph.D.**	Role of low molecular mass (LMM) penicillin-binding proteins (PBP) in modulating immunogenic response and biofilm formation of *Escherichia coli*	**Sathi Mallick**	Prof. T. K. Maiti	**2018**
10	**Ph.D.**	Understanding the mechanistic basis of thiol stabilized copper nanoparticles and biosurfactant stabilized silver nanoparticles in exerting the antimicrobial activity	**Ganesh Kumar**	Prof. Sudip K Ghosh	**2019**
11	**Ph.D.**	Effect of alterations in the bacterial cell surface on the physiology of opportunistic Gram-negative pathogens	**Shilpa Pal**	None	**2019**
12	**Ph.D.**	Functional validation of the non-active site residues affecting the performance of class a and class B beta-lactamases	**Jyoti Verma**	None	**2022**

13	**Ph.D.**	Molecular analysis of efflux pump-mediated antibiotic resistance, metal-antibiotic cross-resistance, and the role of efflux pumps in biofilm formation	**Anwesha Adhikary**	None	**2023**
14	**Ph.D.**	Deciphering the role of omega-loop in penicillin-interactive enzymes and evaluation of peptides designed against it to counter β-lactam antibiotic resistance	**Sarmistha Biswal**	None	**2023**
15	**Ph.D.**	Physiological assessment of the roles of non-active site residues on the performance of carbapenemases of gram-negative bacteria	**Diamond Jain**	None	**2023**

- **Research Funding received for sponsored projects and consultancy:**

Total number of grants obtained: 24 (As PI- 19) Completed: 20: Ongoing: 04
Total value ~INR ~ 14, 50, 00, 000.00 (approx. USD 2. 00 Millions since 2005)

- Extramural Project: Department of Biotechnology (DBT), GOI
  [Role] ([Duration]): **Principal Investigator** [06-09-2023 to 05-09-2026]
  - [Description]: Search for antibiotic-consuming bacteria for reduction of persistent antibiotic residues in the environment with a target to design and establish on-site beta-lactam bioremediation strategy **[74.776 Lakhs]**

- Extramural Project: Department of Biotechnology (DBT-NE), GOI
  [Role] ([Duration]): **Principal Investigator** [21-09-2023 to 20-09-2026]
  - [Description]: Designing a secondary resistance based biomarker for detection of antimicrobial resistance (AMR) in multi-drug resistant bacteria **[84.906 Lakhs]**

- Extramural Project: Albert David Limited, Kolkata
  [Role] ([Duration]): **Principal Investigator** [01-04-2023 to 31-03-2026]
  - [Description]; Exploring the possible mechanisms of Placentrex in the inhibition of bacterial growth by assessing its effect on antimicrobial susceptibility and biofilm formation **[26.55 Lakhs]**

- Extramural Project: Indian council of Medical Research [ICMR]
  [Role] ([Duration]): **Co-Principal Investigator** [20-02-2023 to 19-02-2026]
  - [Description]; Investigating the role of Eut microcompartment in competitive fitness of *Salmonella enterica* in intramacrophagic environment **[51.74 Lakhs]**

- Extramural Project: Indian council of Medical Research [ICMR]
  [Role] ([Duration]): **Principal Investigator** [15-02-2021 to 14-02-2024]
  - [Description]; Identification and Characterization of putative metallo-beta-lactamases of *Mycobacterium smegmatis* **[18.60 Lakhs]**

- Extramural Project: Council of Scientific and Industrial Research [CSIR]
  [Role] ([Duration]): **Principal Investigator** [01-08-2020 to 31-07-2023]
  - [Description]; Physiology of a putative DD-CPase (Rv3330) of *Mycobacterium tuberculosis* [34.65 Lakhs]

- Extramural Project SERB, DST, GOI
  [Role] ([Duration]): **Co-Principal Investigator** [19-03-2020 to 18-09-2023]
    - [Description]: "Potential utility of bacterial microcompartments at harsh reaction conditions employed in biocatalytic industries" [46.21 Lakhs]

- Extramural Project: Department of Biotechnology (DBT-NE), GOI
  [Role] ([Duration]): **Principal Investigator** [28-09-2018 to 27-09-2022]
    - [Description]: Molecular Analysis of Emerging Carbapenem Hydrolysing ClassD Beta-Lactamases (CHDLs) in Gram Negative Bacteria and theirControl using Anti Plasmid Compounds [107.30 Lakhs]

- Extramural Project: Ministry of Health and Family Welfare, GOI
  [Role] ([Duration]): **Co-Principal Investigator** [08-02-2017 to 31-03-2022]
  [Description]; Development of Indigenous Detection Tool for *Entamoeba histolytica* from Stool Sample [243.0 Lakhs]

- Institute Challenge Grant [SGDRI, SRIC-IIT Kharagpur]
  [Role] ([Duration]) **Co-Principal Investigator** [11/2015 to 11/2018]
  [Description]: Development of infrastructure for germ-free/gnotobiotic mice for screening of psychobiotics strains [250.0 Lakhs]

- Extramural Project (NPDF] SERB, GOI
  [Role] ([Duration]): **Principal Investigator** [26-04-2016 to 25-04-2018]
    - [Description] : Physiological characterization of msmeg_2432, a putative D, D-carboxypeptidase of *Mycobacterium smegmatis* [19.20 Lakhs]

- Extramural Project from Department of Biotechnology (DBT), GOI
  [Role] ([Duration]): **Principal Investigator** [28-05-2015 to 27-05-2018]
    - [Description]: Physiological characterization of AmpH protein of *Escherichia coli* [36.866 Lakhs]

- Institute Challenge grant [SGIRG: SRIC-IIT Kharagpur]
  [Role] ([Duration]):**Principal Investigator** [27-04-2014 to 26-04-2017]
  [Description]: Molecular Characterization of Putative DD-Carboxypeptidase
    - of*Klebsiellapneumoniae* [25.0 Lkhs]

- Extramural Project From Department of Biotechnology (DBT-NE), GOI
  [Role] ([Duration]): **Principal Investigator** [19-02-2014 to 18-02-2017]
    - [Description]: Molecular analysis of efflux pump mediated antibiotic resistance in Gram negative bacilli [87.65 Lakhs]

- Consultancy Project from Global Exim, Mumbai, India
  [Role] ([Duration]): **Co-Principal Investigator** [15-05-2016 to 14-07-2016]
    - [Description]: Study for determining efficiency of sodium saccharin on hypobromous acid aided treatment of aqueous systems/process water for bio-fouling control [1.21 lakhs]

- Extramural Project: Council of Scientific and Industrial Research [CSIR]

[Role] ([Duration]): **Principal Investigator** [21-10-2013 to 31-10-2016]
- [Description]; Molecular characterization of penicillin-interactive enzymes (Low Molecular Mass) of *Mycobaceriumsmegmatis* [29.92 Lakhs]

- Extramural Project From Department of Biotechnology (DBT-NE), GOI
  [Role] ([Duration]): **Principal Investigator** [15-12-2011 to 15-05-2015]
  - [Description]: Molecular characterization of the emerging beta-lactamases
  - in Gram-negative bacilli [100.51 Lakhs]

- Extramural Project From Department of Biotechnology (DBT), GOI
  [Role] ([Duration]) **Principal Investigator** [29-11-2010 to 28-11-2013]
  - [Description]: Molecular characterization of DacD (a putative DD-carboxypeptidase) of

  Escherichia coli [21.97 Lakhs]

- Extramural Project: Council of Scientific and Industrial Research [CSIR]
  [Role] ([Duration]): **Principal Investigator** [01-07-2010 to 31-12-2013]
  - [Description]: Effects of auxiliary membrane components on biofilm formation in *Escherichia coli* [26.765 lakhs]

- Extramural Project: Indian Council of Medical Research [ICMR]
  [Role] ([Duration]): **Principal Investigator** [01-10-2008 to 30-09-2011]
  [Description]: Role of PBP and O-antigens in the development of beta-lactam antibiotic resistance in Gram-negative bacteria [15.44 Lakhs]

- Extramural Project: Department of Science and Technology (DST), GOI
  [Role] ([Duration]): **Principal Investigator** [01-08-2007 to 31-01-2011]
  - [Description]: Functional charaterization of soluble penicillin-binding protein 6 of *Escherichia coli* [22.864 Lakhs]

- Extramural Project From Department of Biotechnology (DBT), GOI
  - [Role] ([Duration]): **Principal Investigator** [27-01-2006 to 26-07-2009]
  - [Description]: Establishment of an in vivo method for detection of O-antigens in Gram-negative bacteria [21.9 Lakhs]

- ISIRD Grant from SRIC-IIT Kharagpur
  - [Role] ([Duration]): **Principal Investigator** [28-12-2005 to 31-12-2008]
  - [Description]; Expression optimization and partial purification of soluble PBP 6 and fusion proteins of PBP 5 [3.00 Lakhs]

➢ **Publications**:

Journal Publications: **60** (peer-reviewed Intl./ Natl. journal), **Corresponding author[¶]**: **46**

***h*-index: 20, *i*10-index-32, Total citation: 1454;** Citation: ~**24.23 /publ.**, JIF~**4.15/ publ.**

1. Chatterjee D., Daya Manasi A. R., Rastogi SK., Panda AP., Biju B , Bhattacharyya D , **Ghosh AS [¶] (2024),** Involvement of CorA of *Mycobacterium smegmatis* in exerting intrinsic resistance towards structurally unrelated antibiotics. ***J. APPL. MICROBIOL.*** 135 (12), lxae298. doi: 10.1093/jambio/lxae298

2. Pal S, Jain D, Biswal S, Rastogi SK, Kumar G, **Ghosh AS¶ (2024),** The physiological role of *Acinetobacter baumannii* DacC is exerted through influencing cell shape, biofilm formation, the fitness of survival and manifesting DD-carboxypeptidase and beta-lactamase dual-enzyme activities. ***FEMS MICROBIOL LETT.*:371**, fnae079. doi: 10.1093/femsle/fnae079.

3. Chatterjee D, Panda AP, Daya Manasi AR and **Ghosh AS¶ (2024)**, P-type ATPase zinc transporter Rv3270 of *Mycobacterium tuberculosis* enhances multi-drug efflux activity, ***MICROBIOL.*, 170 (2),** 001441. doi 10.1099/mic.0.001441

4. Panda AP, Pandey SD, Jain D**, Ghosh AS¶ (2024),** The MSMEG_1586 of *M. smegmatis* Is a Penicillin-Interactive Enzyme That Can Potentially Hydrolyse Aztreonam and Cephalosporins, ***CURR. MICROBIOL*., 81:26**, doi: 10.1007/s00284-023-03545-0

5. Adhikary A, Chatterjee D, **Ghosh AS ¶ (2023),** ABC superfamily transporter Rv1273c of *Mycobacterium tuberculosis* acts as a multidrug efflux pump, ***FEMS MICROBIOL LETTS,* 370, 1-8, fnad114,** doi: 10.1093/femsle/fnad114

6. Verma J, Jain D, Panda AP, Kant S, **Ghosh AS ¶ (2023)**, Involvement of the non-active site residues in the catalytic activity of NDM-4 metallo beta-lactamase, ***PROTEIN J, 42:316–326. doi:*** 10.1007/s10930-023-10124-6.

7. Jain, D, Verma, J, Ajith, T, Bhattacharjee, A, **Ghosh AS ¶ (2023),** Two non-active site residues W165 and L166 prominently influence the beta-lactam hydrolytic ability of OXA-23 beta-lactamase, ***J. ANTIBIOTICS***, 76(8):489-498. doi: 10.1038/s41429-023-00624-z [**Front Page Citation]**

8. Biswal, S.; Caetano, K.; Jain, D.; Sarrila, A.; Munshi, T.; Dickman, R.; Tabor, A.B.; Rath, S.N.; Bhakta, S¶.; **Ghosh AS ¶ (2023),** Antimicrobial Peptides Designed against the Ω-Loop of Class A β-Lactamases to Potentiate the Efficacy of β-Lactam Antibiotics. ***ANTIBIOTICS***, 12(3):553.

9. Adhikary A , Biswal S , Chatterjee D , **Ghosh AS ¶ (2022**), A NiCoT family metal transporter of Mycobacterium tuberculosis (Rv2856/NicT) behaves as a drug efflux pump that facilitates cross-resistance to antibiotics, ***MICROBIOL***. 168 (10), 001260. 10.1099/mic.0.001260.

10. Adhikary A, Biswal S, **Ghosh AS ¶ (2022)**, The putative major facilitator superfamily (MFS) protein named Rv1877 in *Mycobacterium tuberculosis* behaves as a multidrug efflux pump, ***CURR. MICROBIOL***., 79, 384. doi.org/10.1007/s00284-022-03021-1

11. Jain D, Verma J, **Ghosh AS ¶ (2022),** Deciphering the role of residues in the loops nearing the active site of OXA-58 in imparting beta-lactamase activity, ***MICROBIOL*.** 168 (5), 001203. doi:10.1099/mic.0.001203.

12. Verma J , Jain D, Mallik D, **Ghosh AS ¶ (2022),** Comparative insight into the roles of the non active-site residues E169 and N173 in imparting the beta-lactamase activity of CTX-M-15. ***FEMS MICROBIOL LETT.*** 369 (1); pii. fnac018. doi: 10.1093/femsle/fnac018.

13. Mallik D, Jain D, Bhakta S, **Ghosh AS ¶ (2022),** Role of AmpC-inducing genes in modulating other serine beta-lactamases in *Escherichia coli*. ***ANTIBIOTICS,*** 11 (1), 67. https://doi.org/10.3390/antibiotics11010067

14. Mallick S , Kiran S , Maiti TK, **Ghosh AS ¶ (2021),** PBP4 and PBP5 are involved in regulating exopolysaccharide synthesis during *Escherichia coli* biofilm formation. ***MICROBIOL***, 167(3):001031 doi: 10.1099/mic.0.001031.

15. Pandey SD, Jain D, Kumar N, Adhikary A, Kumar NG and **Ghosh AS ¶, (2020),** MSMEG_2432 of Mycobacterium smegmatis mc2155 is a dual function enzyme that exhibits DD-carboxypeptidase and β-lactamase activities, ***MICROBIOL.*** 166(6):546-553.

16. Kumar GN, Pandey SD, Mallick S, Ghosh SK, Pramanik P, **Ghosh AS ¶ (2020)**, Thiol stabilized copper nanoparticles exert antimicrobial properties by preventing cell division in *Escherichia coli*, **IND. J. BIOCHEM. BIOPHYS. [Special issue in "Molecular Diagnostics & Therapeutics"]*IND. J. BIOCHEM. & BIOPHYS.***, 57, 151-157 (Highlighted in the Front page).

17. Kumar G, Issa B, Biswal S., Jain D, Bhattacharjee A. and **Ghosh AS ¶, (2020)**, Glutamic acid at position 152 and Serine at position 191 are the key residues required for the metallo-beta-lactamase activity of NDM-7, ***INTL. J. ANTIMICROB. AGENTS****, 55 (1), 105824.*

18. Pal S, Verma J, Mallick S, Rastogi SK, Kumar A and **Ghosh AS ¶, (2019),** Absence of the glycosyltransferaseWcaJ in *Klebsiella pneumoniae* ATCC13883 affects biofilm formation, increases polymyxin resistance & reduces murine macrophage activation. ***MICROBIOL.***,165(8):891-904.

19. Mallick S, Das J, Verma J, Mathew S, Maiti TK and **Ghosh AS¶** , **(2019),** Role of *Escherichia coli* endopeptidases and DD-carboxypeptidases in infection and regulation of innate immune response. ***MICROBES INFECT.*** 21(10):464-474.pii: S1286-4579(19)30055-3. [**Highlighted article of June 2019**]

20. Singha M, Kumar G, Jain D, Kumar N G, Ray D, **Ghosh AS ¶,** and Basak A**¶, (2019**), Rapid Fluorescent-Based Detection of New Delhi Metallo-β-Lactamases by Photo-Cross-Linking Using Conjugates of 3 Azidonaphthalimide and Zinc(II)-Chelating Motifs. ***ACS OMEGA***, 4, 10891−10898.

21. Kumar NG, Kumar G, Mallick S, Ghosh SK, Pramanick P and **Ghosh AS¶ (2019),** Bio-surfactin stabilised silver nanoparticles exert inhibitory effect over New-Delhi metallo-beta-lactamases (NDMs) and the cells harbouring NDMs, ***FEMS MICROBIOL LETT.*** 366(10). pii: fnz118.

22. Pal S,**Ghosh AS ¶**,**(2019),** PBP Isolation and DD-Carboxypeptidase Assay**.** ***Acinetobacter baumannii, METHODS MOL BIOL.***2019; 1946:207-225.

23. Pandey SD, Pal S, Kumar NG, Bansal A, Mallick S and **Ghosh AS¶, (2018),** Two DD-carboxypeptidases from *Mycobacterium smegmatis* affect cell surface properties through regulation of peptidoglycan cross-linking and glycopeptidolipids, ***J BACTERIOL.***, 200(14). pii: e00760-17.

24. Mallik D, Pal S, **Ghosh AS¶, (2018**), Involvement of AmpG in mediating a dynamic relationship between serine beta-lactamase induction and biofilm forming ability of *Escherichia coli*. ***FEMS MICROBIOL LETT.*** 365(8), fny065.

25. Kar D, Pandey SD, Mallick S, Dutta M , **Ghosh AS¶**,**(2018**), Substitution of Alanine at Position 184 with Glutamic Acid in *Escherichia coli* PBP5 Ω-Like Loop Introduces a Moderate Cephalosporinase Activity. ***PROTEIN J.***, 37(2):122-131.

26. Kumar G, Biswal S, Nathan S, **Ghosh AS¶**,**(2018**), Glutamate residues at positions 162 and 164 influence the beta-lactamase activity of SHV-14 obtained from *Klebsiella pneumoniae*. ***FEMS MICROBIOL LETT.***, 365(2) fnx259.

27. Singha M, Roy S, Pandey SD, Bag SS, Bhattacharya P, Das M, **Ghosh AS¶**, Ray D, Basak A**¶**,**(2017),** Use of azidonaphthalimide carboxylic acids as fluorescent templates with a built-in photo reactive group and a flexible linker simplifies protein labeling studies: applications in selective tagging of HCAII and penicillin binding proteins. ***CHEM COMMUN (CAMB)***. 53(97): 13015-13018. **[Front Page article]**

28. Bansal A, Kar D, Pandey SD, Matcha A, Kumar NG, Nathan S, **Ghosh AS**[¶] ,**(2017)**, A Tyrosine Residue Along with a Glutamic Acid of the Omega-Like Loop Governs the Beta-lactamase Activity of MSMEG_4455 in *Mycobacterium smegmatis.* ***PROTEIN J.*** 36(3):220-227.

29. Kumar G, Issa B, Kar D, Biswal S, **Ghosh AS**[¶], **(2017),** E152A substitution drastically affects NDM-5 activity. ***FEMS MICROBIOL LETT.***, 364(3) fnx008.

30. Choudhury D, Paul D, Ghosh AS, Talukdar A D, Choudhury M D, Maurya AP, Chanda D D, Chakravarty A, Bhattacharjee A, **(2016),** Effect of single-dose carbapenem exposure on transcriptional expression of blaNDM-1 and mexA in *Pseudomonas aeruginosa.* ***J GLOB ANTIMICROB RESIST.*** 7: 72-77.

31. Bansal A, Mallik D, Kar D, **Ghosh AS**[¶,] (2016), Identification of a multidrug efflux pump in *Mycobacterium smegmatis,* ***FEMS MICROBIOL LETT.*** 363(13) fnw128.

32. Sharma S, Bano S, **Ghosh AS**, Mandal M, Kim HW, Dey T, Kundu SC **(2016)**, Silk fibroin nanoparticles support in vitro sustained antibiotic release and osteogenesis on titanium surface, ***NANOMED-NBM***. 12(5):1193-204.

33. Kumar A, Mallik D, Pal S, Mallick S, Sarkar S, Chanda A, **Ghosh AS**[¶], **(2015)**, Escherichia coli O8-antigen enhances biofilm formation under agitated conditions. ***FEMS MICROBIOL LETT.***, 362(15):fnv112.

34. Bansal A, Kar D, Murugan RA, Mallick S, Dutta M, Pandey SD, Chowdhury C and **Ghosh AS**[¶], (**2015),** A putative low-molecular mass (LMM) penicillin-binding protein (PBP) of Mycobacterium smegmatis exhibits prominent physiological characteristics of DD-Carboxypeptidase and beta-lactamase. ***MICROBIOL.,*** 161 (6), 1081-1091

35. Dutta M, Kar D, Bansal A, Chakraborty S, **Ghosh AS**[¶]**,(2015**), A single amino acid substitution in the OMEGA-like loop of *E. coli* PBP5 disrupts its ability to maintain cell-shape and intrinsic beta-lactam resistance. ***MICROBIOL.,*** 161 (4), 895-902

36. Halder PK, Naskar D, Kumar A, Yao J, Kundu SC [¶] and **Ghosh AS** [¶],**(2015)**, Potential mode of protection of silkworm pupae from environmental stress by harboring the bacterial biofilm on the surfaces of silk cocoons. ***CURR. MICROBIOL.,*** 70: 228-234

37. Chakraborty S, Ramírez AR, Ásgeirsson B, Dutta M, Ghosh AS, Oda M, Venkatramani R, Rao BJ, Dandekar AM , Goñi FM, **(2015),** Dipeptidyl peptidase-IV inhibitors used in type-2 diabetes inhibit a phospholipase C: a case of promiscuous scaffolds in proteins, ***F1000-RESE*****ARCH,**2:286.

38. Kayet A, Datta D, Kumar G, Ghosh AS[¶] and Pathak T[¶], **(2014),** Templating effect of 1, 5-disubstituted 1,2,3-triazole-linked disaccharides on size, shape and antibacterial activity of silver nanoparticles, ***RSC ADVANCES***4 108(4), 63036 – 63038.

39. Vijayan S, Mallick S, Dutta M, Narayani M and **Ghosh AS**[¶], **(2014),** PBP deletion mutants of *Escherichia coli* exhibit irregular distribution of MreB at the deformed zones, ***CURR MICROBIOL,*** 68:174–179.

40. Chakraborty S, Asgeirsson B, Dutta M, Ghosh AS, Oda M, Rendón A, Goñi F, Frere J M, Venkatramani R, Dandekar A, Rao B, **(2014)**, Promiscuous scaffolds in proteins - non-native, non-additive and non-trivial***, F1000 RESEARCH,*** 2:260.

41. Mallik D, Kumar A, Sarkar SK **Ghosh AS**[¶], **(2013)**, Multiple resistance mechanisms acting in unison in an *Escherichia coli* clinical isolate, ***CURR MICROBIOL,*** 67(6):748-53.

42. Sarkar S, Dutta M, Kumar A, Mallik D and **Ghosh AS¶, (2012),**Sub-inhibitory cefsulodin sensitization of *E. coli* to β-lactams is mediated by PBP1b inhibition, ***PLOS ONE,*** 7(11): e48598.

43. Chowdhury C, Kar D, Dutta M, Kumar A and **Ghosh AS¶, (2012),** Moderate deacylation efficiency of DacD explains its ability to partially restore beta-lactam resistance in *E. coli* PBP5 mutant, ***FEMS MICROBIOL LETT***, 337,73-80**.**

44. Kumar A, Sarkar S, Ghosh D and **Ghosh AS¶, (2012**), Deletion of penicillin-binding protein 1b impairs biofilm formation and motility in *Escherichia coli.* ***RES MICROBIOL,*** 163 (4):254-7.

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50. Sarkar SK and **Ghosh AS¶**, **(2008),** Involvement of O8-antigen in altering β-lactam antibiotic susceptibilities in *Escherichia coli*, ***FEMS MICROBIOL LETT.***282, 59-64

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54. Ghosh AS^, Nilsen T^**,** Goldberg MB and Young KD,**(2004),** Branching sites and morphological abnormalities behave as ectopic poles in shape- defective *Escherichia coli*. [^Co-first authors], ***MOL MICROBIOL,*** 52 (4), 1045-1054.

55. Ghosh AS and Young KD, **(2003),** Sequences near the active site in chimeric penicillin binding protein 5 and 6 affect the uniform morphology of *Escherichia coli*. ***J BACTERIOL,*** 185 (7), 2178-2186.

56. Ghosh AS ^, Nelson DE^, Paulson AL and Young KD**,(2002),** Contribution of membrane-binding and enzymatic domains of penicillin binding protein 5 to maintenance of uniform cellular morphology of *Escherichia coli.* ^Equal contribution .***J BACTERIOL,*** 184(13), 3630-3639.

57. **Ghosh AS,** Kar AK and Kundu M**, (1999),** Impaired Imipenem uptake associated with alteration in the outer membrane proteins *and lipopolysaccharides in Imipenem resistant Shigella dysenteriae.* ***J ANTIMICROB CHEMOTHER.*** 43, 195-201.

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- **Publications/ Talks in the proceedings of Seminars/ Conference [International/ National]: International: [Total # 52]**

1. **Ghosh AS (2024):** Chairing a session on Technical Session –V, Topic- "Action Plan on AMR" on December 09, 2024 in **the International Conference of Contemporary Antimicrobial Research-2024 (ICCAR-2024) held North-Eastern Hill University, Assam, India from December 08-10, 2024.**
2. **Ghosh AS (2024):** Delivered opening plenary lecture on "Involvement of magnesium transporter CorA of Mycobacterium smegmatis in exerting intrinsic resistance towards structurally unrelated antibiotics" on December 08, 2024 in **the International Conference of Contemporary Antimicrobial Research-2024 (ICCAR-2024) held North-Eastern Hill University, Assam, India from December 08-10, 2024.**
3. **Ghosh AS (2024):** Delivered a talk on "Active metal transporters of Mycobacterium tuberculosis facilitate cross-resistance to structurally unrelated antibiotics" **on June 28, 2024 at International Faculty Development Program-2024 organized by Guru Nanak Institute of Pharmaceutical Science and Technology, Kolkata.**
4. Chatterjee, D, Daya Manasi AR and **Ghosh AS *(2024),** "Magnesium transporter CorA of *Mycobacterium smegmatis* influences multi-drug efflux activity" **Poster presentation in ASM Microbes-2024,** held in **Atlanta Georgia, USA** from **June 13-18, 2024.**
5. Panda AP and **Ghosh AS*(2024):** "Substitution of valine to glutamic acid in the omega-like loop of MSMEG_6194 of *Mycobacterium smegmatis* inter-changes its activity from a DD-carboxypeptidase to a beta-lactamase"**, Poster presentation in ASM Microbes-2024,** held in **Atlanta Georgia, USA** from **June 13-18, 2024.**
6. **Ghosh AS (2024):** Plenary lecture on "Non-active site amino acid residues as the potential targets for designing inhibitors against various classes of beta-lactamases" in **Bioradiance-2024 International Conference on May 16, 2024 at Pushpagiri Medical College, Thiruvala, Kerala**
7. **Ghosh AS (2024): Ghosh AS (2023): Chaired a session on AMR in Bioradiance-2024 International Conference on May 16, 2024 at Pushpagiri Medical College, Thiruvala, Kerala**
8. **Ghosh AS (2023):** "Active metal transporters of Mycobacterium tuberculosis facilitate cross-resistance to structurally unrelated antibiotics"**, Delivered an invited talk on Nov. 17, 2023 in the International Conference on Contemporary Antimicrobial Research-2023 (ICCAR-2023), held in Assam University, Silchar, India from Nov. 16-18, 2023.**
9. **Ghosh AS (2023): Chaired a session on "One Health Approach"** on Nov. 17, 2023**, in the International Conference on Contemporary Antimicrobial Research-2023 (ICCAR-2023), held in Assam University, Silchar, India from Nov. 16-18, 2023.**

10. **Ghosh AS**, Verma J, Jain D. (2023), "Non-active site residues D192 and S217 influence the metallo beta-lactamase activity of NDM-4", **presented at FEMS 2023, 10th Congress of European Microbiologists at Hamburg, Germany from July 09-13, 2023.**
11. Jain D and **Ghosh AS** (2023), "The residues N210 and D182 in VIM-2 metallo beta-lactamase influence on substrate specificity and stability of the enzyme", **presented at FEMS 2023, 10th Congress of European Microbiologists at Hamburg, Germany from July 09-13, 2023.**
12. **Ghosh AS: Invited talk on "A Tale of two enzymes- DD-carboxypeptidases and beta-lactamases", June 22nd, 2022 at Birkbeck University of London.**
13. **Ghosh AS: Invited talk on** *"Non-active-site residues E152 and S191 are important for the metallo-beta-lactamase activity of NDM-7"* **Webinar presented for the Antibiotic Awareness Week (AAW) at Birkbeck University, London, UK on November 23, 2021.**
14. **Ghosh AS: Invited talk on** *"Penicillin interactive enzymes and tackling ß-lactam resistance in mycobacteria"***in GCRF International Capacity Building Workshop to Tackle AMR in TB at Birkbeck University, London, UK on July 5th, 2019.**
15. Verma J and Ghosh AS, (2019) E169 in CTX-M-15 plays an imperative role in its physiological activity in Gram negative bacteria, **presented (oral) at FEMS 2019, 8th Congress of European Microbiologists at Glasgow, UK from July 07-11, 2019.**
16. Mallick S, Das J, Verma J, Mathew S, Maiti TK and **Ghosh AS¶ (2019), Role of Escherichia coli endopeptidases and DD-carboxypetidases in infection and regulation of innate immune response, presented at FEMS 2019, 8th Congress of European Microbiologists at Glasgow, UK from July 07-11, 2019.**
17. Jain D and Ghosh AS, (2019), K224A substitution in the loop near to active site of OXA-23 drastically affects its beta-lactamase activity, **presented at FEMS 2019, 8th Congress of European Microbiologists at Glasgow, UK from July 07-11, 2019.**
18. Adhikari A and Ghosh AS (2019), Molecular characterization of a dual activity metal and antibiotic efflux pump from *Mycobacterium tuberculosis,* **resented at FEMS 2019, 8th Congress of European Microbiologists at Glasgow, UK from July 07-11, 2019.**
19. **Ghosh AS¶,** Delivered a talk on "S191A mutation restrict the metallo-betalactamase activity of NDM-7" as an Invited speaker in **"International Conference on Contemporary Antimicrobial Research - 2018 (ICCAR-2018)"** between December 15-17, 2018 at IIT Kharagpur.
20. Mallick S, Verma J, Maiti TK and **Ghosh AS¶**(2018), "Low-molecular-mass penicillin-binding proteins' affect Escherichia coli biofilm formation by regulating the synthesis of its exopolysaccharides" in ICCAR-2018 at IIT Kharagpur, India.
21. Verma J, **Ghosh AS¶** (2018), "Understanding the role of Glu169 present in the omega-loop of CTX-M-15 beta-lactamase", in in ICCAR-2018 at IIT Kharagpur, India.
22. Kumar NG, Kumar G, Mallick S, Ghosh SK, Pramanick P, **Ghosh AS¶** (2018), "Bio-surfactin stabilized silver nano-particles exert inhibitory effect over New-Delhi Metallo beta-lactamases", in in ICCAR-2018 at IIT Kharagpur, India.
23. Adhikary A, **Ghosh AS¶** (2018), "Reporting a dual activity metal and antibiotic efflux pump of *Mycobacterium tuberculosis"* in ICCAR-2018 at IIT Kharagpur, India.
24. Kar D, **Ghosh AS¶** (2018), "Small active site groove volume explains poor DD-carboxypeptidase activity of AmpH in E. coli" in ICCAR-2018 at IIT Kharagpur, India.
25. **Ghosh AS¶,** Kar D, Mallick S, Dutta M, Pandey SD; Substitution of alanine at position 184 in ω–like loop with glutamic acid introduces beta-lactamase activity in *Escherichia coli* PBP5; **Presented at FEMS 2017, 7th Congress of European Microbiologists at Valencia, Spain held from July 9-13 (2017).**
26. Kumar N G, Pandey SD, Mallick S, Pramanick P, Ghosh SK, **Ghosh AS¶**;Copper nanoparticles exert their antimicrobial properties by preventing Z-ring formation; **Presented at FEMS 2017, 7th Congress of European Microbiologists at Valencia, Spain held from July 9-13, (2017).**
27. Kumar G, Kar D, Biswal S and **Ghosh AS¶**; Impact of point mutation S191A of NDM-7 of *Klebsiella12rganized* on its antimicrobial susceptibility and protein stability; **Presented at FEMS 2017, 7th Congress of European Microbiologists at Valencia, Spain held from July 9-13, (2017).**

28. Pal S, Kar D, Kumar G, Kumar A and **Ghosh AS¶**Physiological role of the Low-Molecular-Mass Penicillin-Binding Protein DacC in *Acinetobacterbaumannii*, **Presented at FEMS 2017, 7th Congress of European Microbiologists at Valencia, Spain held from July 9-13, (2017).**
29. **Ghosh AS., "Non-essential Penicillin-binding Proteins and beta-lactam resistance", International Symposium on "Exploring biology of antibiotic resistance and potential targets for early diagnosis and effective management of infectious diseases", TajDecan, Hyderabad, India Jan-12-14, (2017)**
30. **Ghosh A. S., "A Tale of Two Enzymes: DD-Carboxypeptidase and Beta-lactamase", International Conference on Contemporary Antimicrobial Research (ICCAR-2016), Silchar, Assam, India, Nov. 14-17, (2016)**
31. **Ghosh A. S., "Fundamentals of bacterial biofilm development", International Workshop on Biofilm Biology to Drug Development – 2016,Thanjavur, Tamil Nadu, India Sept. 21, (2016)**
32. **Ghosh AS¶**, Bansal A, Kar D, Mallik S and Dutta M, Oral paper presentation on "MSMEG_2433 of Mycobacterium smegmatis exhibits both DD-carboxypeptidase and beta-lactamase activities", **at FEMS 2015, 6th Congress of European Microbiologists at Maastricht, The Netherlands** on June 7-11, **(2015).**
33. Mallik D, Kumar G, Kumar A and **Ghosh AS¶,** poster presentation on "Beta-lactamases influence *Escherichia coli* biofilm formation", **at FEMS 2015, 6th Congress of European Microbiologists at Maastricht, The Netherlands** on June 7-11, **(2015).**
34. Kumar G, Nathan S and **Ghosh AS¶, poster** presentation on "Physiological characterization of SHV14 beta-lactamase of *Klebsiella13rganized*"**, at FEMS 2015, 6th Congress of European Microbiologists at Maastricht, The Netherlands** on June 7-11, **(2015).**
35. Pal S,Mallik D,**Ghosh AS¶,** posterpresentation on **"*WcaJ* deletion enhances biofilm formation in *Klebsiella13rganized"* at FEMS 2015, 6th Congress of European Microbiologists at Maastricht, The Netherlands** on June 7-11, **(2015).**
36. Kar D, Bansal A, Chakraborty S and **Ghosh AS¶**, poster presentation on "**Influence of active site groove volume on DD-carboxypeptidase activity of *E. coli*DacD" at FEMS 2015, 6th Congress of European Microbiologists at Maastricht, The Netherlands on June 7-11, (2015).**
37. Mallick S, Mathew S, Maiti TK and **Ghosh AS¶,** "*Escherichia coli* LMM PBPs in Evasion of Host Innate Immune System" present at **114th ASM General Meeting at Boston, MA, USA**, May 17-20, **(2014)**
38. Bansal A, Kar D, Mallik D and **Ghosh AS¶**, Molecular characterization of putative efflux pump MSMEG_2991 of M. smegmatis, **Society of General Microbiology, Autumn Conference, University of Sussex, United Kingdom,** September 2- 4 **(2013)**
39. Dutta M, KarD,**Ghosh AS¶**, "*Klebsiella13rganizeddacA* homologue: A DD-carboxypeptidase or Beta-lactamase? " **International conference on Antimicrobial Agents and Chemotherapy (ICAAC), ASM, Denver, USA,** September 10-13 **(2013).**
40. **Ghosh AS¶**, Sarkar S K, Dutta M, Kumar A, Mallik D, Presentation on "Non-essential Penicillin-Binding Proteins (PBPs) Maintain an Intrinsic Beta-lactam Non-lactam Resistance and Influence Biofilm Formation in *Escherichiacoli*", **FEMS 2013, 5th Congress of European Microbiologists, Leipzig, Germany**, July 21-25 **(2013)**
41. Kumar A, singh D, **Ghosh AS¶**, Isolation of transposon mutant of Escherichia coli with altered biofilm formation, **3rd World Congress on Biotechnology,, HICC, Hyderabad, India,** September 13-15, **(2012)**
42. Kumar A, **Ghosh AS¶,** "*Escherichia coli* O8-antigen enhances biofilm formation under agitated conditions", **6th ASM Conference on Biofilms, Miami, Florida,** September 29 – October 4, **(2012)**
43. Kumar A, singh M D, **Ghosh AS¶,** Quantitative characterization of biofilm-altered Escherichia coli transposon mutants using COMSTAT software, **International conference onMicrobial world: recent innovations and future trends**, KIIT University Bhubaneswar, Odisha, November 22-25, 2012, **(2012).**
44. **Ghosh AS**: paper presentation on "Non-essential penicillin binding proteins (PBPs) maintain an intrinsic beta-lactam resistance in *Escherichia coli*" *at* **InternationalWorkshop on Microbial Biology, Hyderabad, December 11-14, (2012).**

45. **Ghosh AS¶**, Mallik D, Dutta M, Kumar A and Mallick S, paper presentation on "Emergence of Multi-Factorial Resistance in Enterobacterial Clinical Isolates", **Asia Pacific Travel Health Conference at Singapore** on May 01-06**, (2012)**
46. Sarkar S K, Chowdhury C and **Ghosh AS¶**: Paper presentation on "PBP 5 acts an intrinsic modulator of beta-lactam resistance in *Escherichia coli*" at the "**International symposium on physics chemistry mathematics and Biology**" held at Bose Institute, Kolkata from December 4-6, **(2008).**
47. Gallant C V, **Ghosh AS**, Kotra L, Young K D, Leung J and Burrows L L. "Mutation of individual peptidoglycan biosynthetic proteins affects virulence-related phenotypes (including biofilm formation) in a cumulative manner."**Bacterial Cell Surfaces, Gordon Research Conference, Colby-Sawyer College, New London, NH, June 27-July 1, (2004)**.
48. **Ghosh AS** and Young K D, Intact O-antigen reduces cell shape abnormalities in penicillin-binding protein mutants of *Escherichia coli*. **ASM 2004 General Meeting**, **New Orleans, Louisiana, USA on May 23rd – 27th (2004).**
49. Gallant C V,**Ghosh AS,** Young K D and Burrows L L, Penicillin-binding and penicillin-breaking proteins: their effects on *Escherichia coli* biofilm formation. **ASM Conference on Biofilms 2003**, Victoria, British Columbia, Canada, November 1-6, **(2003).**
50. **Ghosh AS,** Goldberg M B and Young K D**.** Patches of Inert Peptidoglycan Display Characteristics of Poles in *E. coli* PBP Mutants. **ASM 2003 General Meeting** at Washington DC, USA, on May 18th-22nd**(2003).**
51. Paulson A L, Nelson D E,**Ghosh AS and** Young K D**.** Contributions of Multiple Low Molecular Weight Penicillin Binding Proteins to Uniform Cellular Morphology of *E. coli*. **ASM 2002 General Meeting** Salt Lake City, Utah, USA, 19-23rd May, **(2002).**
52. **Ghosh AS,** Nelson D E and Young K D**.** Domain of PBP 5 responsible for maintenance of cell shape in *E.coli*.**ASM 2002 General Meeting** at Salt Lake City, Utah, USA, 19-23rd May, **(2002).**

National: [Total # 26]

1. **Ghosh AS (2024): Delivered a talk on "**Active metal transporters of *Mycobacterium tuberculosis* facilitate cross-resistance to structurally unrelated antibiotics", on September 11th 2024 in the **Department of Biotechnology, University of North Bengal, Siliguri, Dist. Darjeeling, WB.**
2. **Ghosh AS (2024): Delivered a talk on "**A Tale of Two enzymes - DD-Carboxypeptidase and Beta-lactamase", on August 27th, 2024 **in the Interdisciplinary Refresher Course in Life Science-2024 at Assam University, Silchar, Assam.**
3. **Ghosh AS (2024): Delivered a talk on "**Active metal transporters of *Mycobacterium tuberculosis* facilitate cross-resistance to structurally unrelated antibiotics", on August 20th, 2024 **in Interdisciplinary Refresher Course in Life Science-2024 at Assam University, Silchar.**
4. **Ghosh AS (2024):** Delivered a talk on "P-type ATPase zinc transporter Rv3270 of Mycobacterium tuberculosis enhances multi-drug efflux activity against structurally unrelated antibiotics" on April 5, 2024 in **AMR Conference (ICMR) at Science City, Kolkata**
5. **Ghosh AS (2024): Conducted a Live phone-in program on "Research on Modern Antibiotics" in the Scientific Program named "Bigyan Prasange" in DD-Bangla Channel, Door Darshan, India.**
6. Panda AP, Pandey SD and **Ghosh AS (2023): Poster presentation** on "The MSMEG_1586 of Mycobacterium smegmatis is a penicillin-interactive enzyme that can potentially hydrolyze aztreonam and cephalosporins" in the **Annual Conference of Society of Biological Chemists, held from December 16-18, 2023 at Goa, India.**
7. Chatterjee D and **Ghosh AS (2023): Poster presentation** on "P-type ATPase metal transporter Rv3270 of *Mycobacterium tuberculosis* enhances multi-drug efflux activity" in the **Annual Conference of Society of Biological Chemists, held from December 16-18, 2023 at Goa, India.**
8. **Ghosh AS: Invited talk on "Mechanisms behind the antimicrobial activities exerted by thiol stabilized copper nanoparticles and biosurfactant stabilized silver nanoparticles"** at the Symposium on 'Molecular Diagnostics and Therapeutics' organized by College of Medicine & JNM Hospital, WBUHS, Kalyani, Nadia 741235, in association with Association of Clinical Biochemists of

India (ACBI), West Bengal Chapter approved CME by Medical Council of India (MCI) on June 21-22, 2019.

9. **Talk on "A Tale of two enzymes- DD-carboxypeptidases and beta-lactamases" at NIT, Calicut. March 29, 2019.**
10. Ghosh AS, "Non-essential PBPs and beta-lactam resistance " in Microcon-2016 (West Bengal Chapter), IPGMER, Kolkata, India (2016)
11. **Ghosh AS: Invited lecture on "Bacterial cell shape"** at the Teacher's training College, **Calcutta University,** on April 1st, **(2015).**
12. **Ghosh AS:** Invited lecture on "**Bacterial cell shape and DD-carboxypeptidases" at BelurVidyamandir, Ramakrishna Mission, Belur Math,** as part of UGC sponsored symposium entitled "New Horizons in Microbiology: Prospects and Challenges" on November 21st, (2014)**.**
13. **Ghosh AS**: Invited lecture on "Recombinant Cloning" *at* **Assam University, Silchar,** for DBT funded workshop on "Basic Cloning Techniques" from 7th to 9th July **(2014).**
14. **Ghosh AS:** Mukherjee S Oration lecture on '**Effect of auxiliary membrane components on biofilm formation in *Escherichia coli*** ' at MeghnadSaha Auditorium 15rganized by Physiological Society of India (PSI) on July 19, **(2014).**
15. **Ghosh AS:** Invited lecture on "DNA fingerprinting" in the DBT funded workshop *at* Assam University Silchar, Biotech Hub on March 23rd**(2013).**
16. **Ghosh AS**: Invited lecture on "What makes three redundant DD-carboxypeptidases of Escherichia coli behave functionally different?" in *at* **Annual Meeting of Society for Biological Chemists November 8-11, (2012).**
17. **Ghosh AS:** Invited lecture on "Polymerase chain reaction and its application" in the DBT funded workshop at Assam University- Silchar in April, **(2012)**
18. Kumar A, Sarkar S K and **Ghosh AS*,** Deletion of PBP5 increases biofilm formation in *Escherichia coli*, **52 nd Annual Conference of Association of Microbiologists of India (AMI), Panjab University, Chandigarh, November 3- 6 (2011).**
19. **Ghosh AS**: Invited lecture on "Biological Sequence Analysis" *at* Biotech Hub at Vidyasagar University, **(2011)**
20. Kumar A and **Ghosh AS***, PBP1b deletion inhibits biofilm formation in *Escherichia coli*, Biotechnology for Better Tomorrow (BTBT-2011), BAMU, Osmanabad, Maharashtra, February 06-09 (2011)
21. **Ghosh AS**: Invited Lecture on "Cell wall interactive enzymes and O-antigens: regulators of cell shape, polarity and antibiotic resistance", at **Bose Institute, Kolkata** (main campus), **(2009)**
22. **Ghosh AS:** Invited lecture on 'Biological sequence analysis' in the Symposium on "Application of computers in chemical and biological sciences", Jhargram Raj College, Jharagram, West Midnapore, **(2008)**
23. Kumar R M S, Sarkar S K and **Ghosh AS©,** Effects of functional deletions of various penicillin-binding proteins in beta-lactam sensitivity of *Escherichia coli*, National Seminar on Microbes in, Pharmaceuticals, Food and Agriculture, held at Vidyasagar University, W B, India on 20-21st December, **(2006).**
24. **Ghosh AS:** Invited lecture on "Bacterial cell shape" **at Bose Institute Kolkata (2005).**
25. **Ghosh AS. Paper presentation on "**Involvement of a multidrug resistant efflux pump in moderately high-level of ampicillin resistance in***Shigelladysenteriae"*** at **3rd Congress of the Fedaration of Indian Physiological Societies** in Science City, Calcutta held on **24th-26th November, (2000)**.
26. **Ghosh AS** and Ghosh S**;** Study of microbiological status of the lithosphere (top soil) at different regions of Calcutta and its possible impact. **MAEER's MIT PUNE JOURNAL (1994), 3(2), 69 – 73.** [Published from M. Sc. Dissertation]

➢ Book & Book Chapter:

1. **Influence of bacterial cell wall modulating genes and enzymes on biofilm formation with special emphasis on the role of DD-carboxypeptidases of bacteria. Book Chapter 21**

   Author: Sumit Kumar Rastogi and Anindya Sundar Ghosh.

Name of the Book: Understanding Microbial Biofilms. [2022]
Publisher: Elsevier (https://doi.org/10.1016/B978-0-323-99977-9.00013-2)

2. **Monograph: Molecular Study on DD-Carboxypeptidases**: **Characterization of LMM PBPs**, By **DebasishKar and Anindya S. Ghosh**

   ISBN-13 : 978-6200456007, ISBN-10 : 6200456003 ; Publisher : LAP Lambert Academic Publishing (23 October 2019), Language: : English

3. **PBP Isolation and DD-Carboxypeptidase Assay: Pal S, Ghosh AS**. ***Acinetobacter baumannii,*** pp 207-225.***Methods of Molecular Biology.*** 2019; 1946:207-225. DOI: 10.1007/978-1-4939-9118-1_20.

- **Patent information:**

1) Patent Awarded: THIN FILM COATING FOR PREVENTING BIOFOULING OF SUBMERGED SURFACES: **[Application #809/KOL/2013]**

Status: Awarded
Date of Grant: 30/11/2022
Patent Number: 413153

2) Patent Awarded: METHODS FOR DETECTION OF CARBAPENEM RESISTANCE IN PATHOGENIC BACTERIA AND COMPOSITION THEREOF [Application # 202031048932]

Status: Awarded
Date of Grant: 14/02/2023
Patent Number: 421640

- **Membership/ portfolio in the professional bodies:**

(i) Premier member of American Society for Microbiology (**ASM**), USA, since 2001
(ii) Full member of the Microbiology Society (formerly **SGM**), UK, since 2008
(iii) Life members of Society for Biological Chemists (**SBC**), since 2014
(iv) Life member of Physiological Society of India (**PSI**), India since 2013
(v) Life member of Asian Federation of Biotechnology **(AFOB**) since 2015
(vi) Joint Secretary, Society of antimicrobial Research, India **(SAR**), since 2016
(vii) Life Member, Indian Science Congress Association **(ISCA)** India, since 2023
(viii) Member of Royal Society of Biology **(RSB),** UK, **since 2024**

- **Conference organization as Convener:**

International Conference on Contemporary Antimicrobial Research (ICCAR-2018), Dec. 15-17, 2018 at IIT Kharagpur in collaboration with Society of Antimicrobial Research (participants – 133)

- **Reviewer of the Journals:**

Publisher	Name of the Journal
Nature	Scientific Reports (SR)
Proceedings of National Academy of Sciences, USA	PNAS
American Society for Microbiology(ASM)	Journal of Bacteriology (JB) Antimicrobial Agents and Chemotherapy (AAC)
Microbiology Society (MS)	Microbiology Journal of Medical Microbiology (JMM)
Public library of Science (PLoS)	PLoS One (PONE)
Oxford University Press	FEMS Microbiology Letters (FEMSLE) Journal of Applied Microbiology (JAM)
American Chemical Society (ACS)	ACS-Infectious Diseases
Royal Society of Chemistry (RSC)	RSC Advances
Elsevier	International Journal of Antimicrobial Agents (IJAA) Journal of Global Antibiotic Resistance (JGAR) Journal of Molecular Biology (JMB) Microbial Pathogenesis (MP) Infection Genetics and Evolution (MEEGID), Gene Reports
Springer	BMC Microbiology, Current Microbiology Archives of Microbiology
Society for Applied Microbiology (SfAM)	Biofouling, Letters of Applied Microbiology (LAM) Journal of Applied Microbiology (JAM)
Mary Ann Leibert Inc. Publications	Microbial Drug Resistance (MDR)
Other Journals	eLife, Antibiotics (MDPI), Indian Journal of Medical Research (IJMR), Frontiers in Microbiology, Future Microbiology, FEBS Letters, etc.

- **Reviewer of Grant application:**

National: Department of Biotechnology (DBT), Department of Science and Technology (DST-SERB), Kothari Postdoctoral Fellowship, Council of Scientific and Industrial Research (CSIR) etc.

International: Medical Research Council, UK (MRC-UK), Qatar National Research Fund (QNRF), Agencenatioale De la Researche (ANR) France.

- **Current teaching responsibility:**

Autumn Semester: (four courses): ***Theory*** **-** Microbiology (UG), Gene Expression (PG) &***Laboratory***- Analytical Biochemistry (UG) and Microbiology (UG)
Spring Semester: (three courses): ***Theory*** **-** Recombinant DNA Technology (PG), Neurophysiology (UG) &***Laboratory*** **-** Recombinant DNA Technology (PG)

- **Administration in IIT Kharagpur: ~10 years**

1. a. Co-ordinating Warden (Mess-1): Hall Management Centre (HMC), IIT Kharagpur (2019-2021) [~12000 boarders]
b. Warden: B. R. Ambedkar Hall (BRH), IIT Kharagpur [~1300 boarders] - 2017-2019
c. Warden: L. B. Sastry Hall (LBS), IIT Kharagpur [~1800 boarders] - 2015-2017
d. Wardens: R. Prasad Hall (RP), IIT Kharagpur [~750 boarders] - 2013-2015
e. Asst. Warden: R. Prasad Hall (RP), IIT Kharagpur [~750 boarders] - 2012-2013

2. Chairman, Purchase Committee, Central Research Facility (Life Science Division), IIT Kharagpur since 2022.

- **Departmental administration/ activity:**

a. **Faculty Adviser- M. Tech. (2009-2019)- 10 years**
b. **Faculty Adviser- B. Tech. (2007-2008)- 2 years**
c. Departmental purchase committee member (2009 -continuing),
d. **Departmental Examination in-charge (2016 –continuing)**
e. In charge of Confocal Microscopy facility (2007- continuing)
f. Time-table in-charge (2006-2010)