Curriculum Vita

Dr. Angana Sarkar
Assistant Professor
Department of Biotechnology & Medical Engineering
National Institute of Technology Rourkela
Odisha - 769008, India
E-mail: sarkara@nitrkl.ac.in; sarkar.angana@gmail.com
Contact information: Office No: 06612462295; Mobile No: +91-9439096256

Research Interest:

Environmental Biotechnology
Heavy metal and metalloids contamination
Bio-refinery approach for generating "Waste to Value"
Bioenergy
Strain improvement for bioprocess & environmental application
Bioremediation
Geochemical cycle of heavy metals
Microbe-metal interactions
Biosensor Technology for Heavy metal detection
Microbial pigment production
Waste management

Academic Qualifications:

Sl No.	Degree	Institution/Board	Year	% Marks/ CGPA	Division /Class
1	Secondary (10^{th})	West Bengal Board 0f Secondary Education	1998	85.4	1^{st} *
2	Higher Secondary (Science)	West Bengal Council of Higher Secondary Education	2000	73.1	1^{st}
3	B.Tech (Agricultural. Engineering)	Bidhan Chandra Krishi Viswavidyalaya	2005	8.06	1^{st}
4	M.Tech (Biotechnology and Biochemical Engineering.)	Indian Institute of Technology, Kharagpur	2008	8.40	1^{st}
5	PhD (Environmental Biotechnology)	Indian Institute of Technology, Kharagpur	2014	NA	NA

Employment Experience

S.No.	Position and Organization	Nature of Job	Period
1	Research Associate, IIT Kharagpur and CSIR	Research	March 2013-June 2015
2	Assistant Professor, NIT	Teaching and Research	July 2015 to till date

	Rourkela		

Awards and achievements:

- University Merit Fellowship (From 2001-2005)
- Graduate Aptitude Test in Engineering (GATE) 2004
- Graduate Aptitude Test in Engineering (GATE) 2003, AIR-115
- Institute Research Fellow, Indian Institute of Technology Kharagpur, 2008
- Research Associate fellow, Council of scientific and Industrial Research (CSIR), India, 2013
- Recent research on bio-ethanol production by bacterial fermentation has been covered by newspaper "**The Hindu**", 2019
  Link of the article:
  https://www.thehindu.com/sci-tech/science/nit-rourkela-converting-fruit-waste-to-ethanol/article27949629.ece
- Received Excellent grade in SERB Project

Professional Membership:

- Association of microbiologists of India AMI (ID: 5026-2021)
- Biotechnology research society of India (BRSI) (ID: LM-2328)
- Asian Federation of Biotechnology
- Society for Advanced Academic Research and Development (SAARD)
- Society for Green Environment (Membership No. 102/LM/SGE/2022)

Working as Guest editor of the following journals:

- International Biodeterioration and Biodegradation
- Biocatalysis and Agricultural Biotechnology
- Preparative Biochemistry and Biotechnology
- Ecotoxicology
- Environmental Science & Pollution Research
- Water Quality Management
- SN Applied Science
- Applied Biochemistry and Biotechnology

Working as regular reviewers

- Journal of Environmental Management
- Journal of Microbiological Methods
- Microbial Ecology
- Process Safety and Environmental Protection
- Environmental Science and Pollution Research
- Preparative Biochemistry and Biotechnology
- Chemosphere
- Science of the Total Environment
- Journal of Hazardous Material
- Biomass Conversion & Bioenergy
- International Biodeterioration and Biodegradation
- Ecotoxicology
- Current Microbiology
- GENE

- Science of the total environment (STOTEN)

Working as regular Project reviewers

- SERB IMPRINT Project
- SERB Early Career Research Project

Editorial Board Member

- Frontiers in Environmental Microbiology, Science Publishing Group, USA

Administrative and outreach activities

- Member, Unnat Bharat Abhiyan
- Member, Institute Health & Hygiene Committee
- Member, departmental academic Committee
- PIC Institute Seminar
- Faculty Advisor of B.Tech and M.Tech Students
- PIC Agriculture and Environmental Laboratory
- PIC Accreditation Committee

New Laboratory Establishment:

- Environmental Microbiology and Genomics Laboratory (EMGL)
- UG/PG Biotechnology Teaching Laboratory

List of Publications

Journal Publications:

[1] **Sarkar A**, Kazy SK, Sar P (2012), Characterization of arsenic resistant bacteria from arsenic rich groundwater of West Bengal. Ecotoxicology 22: 366-374. (Impact Factor: **2.460**)

[2] **Sarkar A**, Kazy SK, Sar P (2014), Studies on arsenic transforming groundwater bacteria and their role in arsenic release from subsurface sediment. Environmental Science and Pollution Research 21: 8645-8662. (Impact Factor: **2.941**)

[3] **Sarkar A** and Sar P. (2015) Horizontal gene transfer of *ars* genes: A possible source of arsenic dissemination in subsurface environment. Journal of Environmental Research and Development (JERAD) 9: 803-812. (Impact Factor: **0.078**)

[4] **Sarkar A**, Paul D, Kazy SK, Sar P (2015), Molecular analysis of microbial community in arsenic rich groundwater of Kolsur, West Bengal. Environmental Science and Health Part A 51(3): 229-39. (Impact Factor: **1.561**)
1.561

[5] **Sarkar A**, Sar P, E Islam (2016), Hexavalent chromium reduction by *Microbacterium oleivorans* A1: A possible mechanism of chromate -detoxification and–bioremediation. Recent Patents on Biotechnology**,** 9(2): 116-129.

[6] Mohapatra B, **Sarkar A**, Joshi S, Chatterjee A, Kazy SK, Maiti M K, Satyanarayana T, and Sar P. (2016), An arsenate-reducing and alkane-metabolizing novel bacterium,

Rhizobium arsenicireducens sp. nov., isolated from arsenic-rich groundwater." Archives of Microbiology 199(2): 191-201. (Impact Factor: **1.607**)

[7] Biswas R and **Sarkar A** (2018), Characterization and optimization of arsenite oxidizing strains for their potential in arsenic bioremediation. Preparative Biochemistry and Biotechnology, 2018 Jun 11:1-8. 10.1080/10826068.2018.1476883. . (Impact Factor: **1.241**)

[8] Biswas R and **Sarkar A** (2018), Isolation and characterization of arsenite oxidizing strains for their potential in arsenic bioremediation. Journal of Environmental Research and Development. 12:4, 436-442. ISSN 0973 – 6921; E – ISSN 2319 – 5983 . (Impact Factor: **1.607**)

[9] Gupta K, Babu P and **Sarkar A** (2018) Characterization of marine bacteria for protease production. Journal of Environmental Research and Development, 12:4, 402-409. ISSN 0973 – 6921; E – ISSN 2319 – 5983. (Impact Factor: **1.607**)

[10] Gupta K, Maurya V and **Sarkar A** (2018), Application of advanced omics tools for wastewater treatment. Journal of Environmental Research and Development, 12:4, 493-498. ISSN 0973 – 6921; E – ISSN 2319 – 5983. (Impact Factor: **1.607**)

[11] Biswas R, Vivekanand V, Saha A, Ghosh A, and **Sarkar A** (2019), Arsenite oxidation by a facultative chemolithotrophic Delftia spp. BAs29 for its potential application in groundwater arsenic bioremediation. International Biodeterioration & Biodegradation 136 (2019): 55-62. https://doi.org/10.1016/j.ibiod.2018.10.006 (Impact Factor: **3.841**)

[12] Gupta N, Poddar K, Sarkar D, Kumari N, Padhan B, **Sarkar, A** (2019). Fruit waste management by pigment production and utilization of residual as bio-adsorbent. Journal of Environmental Management 244:138-143. https://doi.org/10.1016/j.jenvman.2019.05.055. (Impact Factor: **4.962**)

[13] Sarkar D, Gupta K, Poddar K, Biswas R, **Sarkar A** (2019) Direct conversion of fruit waste to ethanol using marine bacterial strain *Citrobacter* sp. E4. Process Safety and Environmental Protection, 128 (2019) 203–210. https://doi.org/10.1016/j.psep.2019.05.051. (Impact Factor: **4.384**)

[14] Biswas R and **Sarkar A** (2019). The role of arsenate reducing bacteria for their prospective application in arsenic contaminated groundwater aquifer system. Biocatalysis and Agricultural Biotechnology, 20 (2019): 101218. https://doi.org/10.1016/j.bcab.2019.101218

[15] Poddar K, Sarkar D and **Sarkar A** (2019) Construction of potential bacterial consortia for efficient hydrocarbon degradation. International Biodeterioration & Biodegradation 144 (2019): 104770. (Impact Factor: **3.841**)

[16] Sarkar D, Prajapati S, Poddar K, **Sarkar A** (2019) Production of ethanol by Enterobacter sp. EtK3 during fruit waste biotransformation. International Biodeterioration & Biodegradation 145 (2019): 104795. https://doi.org/10.1016/j.ibiod.2019.104795 (Impact Factor: **3.841**)

[17] Maity S, Biswas R, and **Sarkar A** (2020) Comparative valuation of groundwater quality parameters in Bhojpur, Bihar for arsenic risk assessment. Chemosphere 259 (2020) 127398. (Impact Factor: **5.108**)

[18] Sarkar D, Prajapati S, Poddar K, **Sarkar A** (2020) Ethanol production by Klebsiella sp. SWET4 using banana peel as feasible substrate. Biomass Conversion and Biorefinery, 2020 Jul 25:1-13. *DOI: 10.1007/s13399-020-00880-1* (Impact factor: **2.326**).

[19] Biswas R, and Sarkar A 2020. A two- step approach for arsenic removal by exploiting an autocthonous Delftia sp. BAs29 and neutralized red mud. Environmental Science and Pollution Research, 2020 Sept, 1-13. https://doi.org/10.1007/s11356-020-10665-8 (Impact Factor: **3.306**).

[20] Sengupta, A., & Sarkar, A. (2021). Synthesis and characterization of nanoparticles from neem leaves and banana peels: a green prospect for dye degradation in wastewater. Ecotoxicology, 27 April 2021, 1-12. doi: 10.1007/s10646-021-02414-5 (Impact Factor: **2.535).**

[21] Maity, S., Nanda, S., & Sarkar, A. (2021). Colocasia esculenta stem as novel biosorbent for potentially toxic metals removal from aqueous system. Environmental Science and Pollution Research, 1-17. https://doi.org/10.1007/s11356-021-13026-1. (Impact Factor: **3.306**).

[22] Padhan, B., Poddar, K., Sarkar, D., & Sarkar, A. (2021). Production, purification, and process optimization of intracellular pigment from novel psychrotolerant Paenibacillus sp. BPW19. Biotechnology Reports, 29, e00592. https://doi.org/10.1016/j.btre.2021.e00592.

[23] Poddar, K., Padhan, B., Sarkar, D., Sarkar, A. (2021). Purification and optimization of pink pigment produced by newly isolated bacterial strain Enterobacter sp. PWN1. SN Appl. Sci. 3, 105(2021), 1-11. https://doi.org/10.1007/s42452-021-04146-x.

[24] Debapriya Sarkar, Soumyashree Nanda, Kasturi Poddar, Angana Sarkar (2021). Isolation and characterization of an antibacterial compound producing Stenotrophomonas strain from sewage water, production optimization, and its antibiotic potential evaluation. Environmental Quality Management, 21 May 2021 https://doi.org/10.1002/tqem.21764.

[25] Rahul, S., and Angana Sarkar. "Microbial based natural compounds as potential inhibitors for SARS-CoV-2 Papain-like protease (PLpro): a molecular docking and dynamic simulation study." Journal of Biomolecular Structure and Dynamics (2021): 1-11, https://doi.org/10.1080/07391102.2021.1997815.

[26] Bose S, Maity S, Sarkar, A., Review of microbial biosensor for the detection of mercury in water. Environmental Quality Management (2021), Volume31, Issue4 Pages 29-40. https://doi.org/10.1002/tqem.21742

[27] Poddar, K., Sarkar, D., & Sarkar, A. (2022). Construction of bacterial consortium for efficient degradation of mixed pharmaceutical dyes. Environmental Science and Pollution Research (2022), 1-13. 10.1007/s11356-021-18217-4.

[28] Patil, P.B., Sarkar, D., Poddar, K. and Sarkar, A., Synthesis and characterization of Polyhydroxyalkanoates by soil bacterium Bacillus sp. PhNs9. Journal of Chemical Technology & Biotechnology. https://doi.org/10.1002/jctb.7093

[29] Maity, S., Patil, P.B., Sen Sharma, S. and Sarkar, A., 2022. Bioremediation of heavy metals from the aqueous environment using Artocarpus heterophyllus (jackfruit) seed as a novel biosorbent. Chemosphere, 307, p.136115. doi: 10.1016/j.chemosphere.2022.136115.

[30] Poddar, K., Sarkar, D., Chakraborty, D., Patil, P.B., Maity, S. and Sarkar, A., 2022. Paracetamol biodegradation by Pseudomonas strain PrS10 isolated from pharmaceutical effluents. International Biodeterioration & Biodegradation, 175, p.105490. https://doi.org/10.1016/j.ibiod.2022.105490

[31] Kumari G, Sur S and Sarkar A., 2022. Analysis of floral biomass utilization feasibility of Ixora coccinea for its cost-effective application as a natural colorant. Biomass Conversion and Biorefinery. https://doi.org/10.1007/s13399-022-03668-7

[32] Patil P.B., Maity S., Sarkar A., 2022. Potential human health risk assessment of microplastic exposure: current scenario and future perspectives. Environmental Monitoring & Assessment 2022 Oct 17;194(12):898. doi: 10.1007/s10661-022-10539-1.

[33] Patil, P.B., Sarkar, D., Poddar, K., Gu, J.D. and Sarkar, A., 2023. Degradation profiling of in-vitro-produced polyhydroxyalkanoate synthesized by the soil bacterium Bacillus sp. PhNs9 under different microenvironments. International Biodeterioration & Biodegradation, 181, p.105615. https://doi.org/10.1016/j.ibiod.2023.105615

[34] Poddar, K., Sarkar, D., Sahu, J.R., Patil, P.B., Pal, S.K. and Sarkar, A., 2023. Techno-economic assessment of doxycycline recovery using rice straw biochar: A circular economic execution. Chemosphere, Volume 338, p.139504. https://doi.org/10.1016/j.chemosphere.2023.139504

[35] Biswas, R., Paul, D., Maity, S. and Sarkar, A., 2023. Microbial community composition analysis to decipher the possible role of inherent bacteria for in-situ arsenic (As) bioremediation. 3 Biotech, 13(6), p.214. doi: 10.1007/s13205-023-03612-0.

[36] Biswas, R., Rahul, S., Pal, S.K. and Sarkar, A., 2023. Fabrication, characterization and performance analysis of a two-step arsenic bio-filter column using *Delftia* spp. BAs29 and fired red mud pellets. Environmental Geochemistry and Health (2023), 45:4257–4273. https://doi.org/10.1007/s10653-022-01451-1

[37] Dokania, P., Maity, S., Patil, P.B. and Sarkar, A., 2023. Isothermal and Kinetics Modeling Approach for the Bioremediation of Potentially Toxic Trace Metal Ions Using a Novel Biosorbent Acalypha wilkesiana (Copperleaf) Leaves. Applied Biochemistry and Biotechnology, pp.1-31. https://doi.org/10.1007/s12010-023-04678-5

[38] Maity, S., Sarkar, D., Poddar, K., Patil, P. and Sarkar, A., 2022. Biofilm-mediated heavy metal removal from aqueous system by multi-metal-resistant bacterial strain Bacillus sp. GH-s29. Applied Biochemistry and Biotechnology, 195(8), 4832–4850 https://doi.org/10.1007/s12010-022-04288-7

[39] Poddar, K., Sarkar, D., Behera, S. and Sarkar, A., 2023. Mitigation of hydrocarbon toxicity using bacterial consortium in microcosm environment for agrarian fecundity. Environmental Research, 237, p.117077. https://doi.org/10.1016/j.envres.2023.117077

[40] Sarkar, D., Poddar, K., Maity, S., Bajirao Patil, P. and Sarkar, A., 2022. Influence of Antinutrients on Bacterial Growth and Bioethanol Production by Klebsiella sp. SWET4 Through Direct Fermentation of Fruit Wastes: a Novel Perspective for Substrate Selection. BioEnergy Research, 16(1), pp.191-202. https://doi.org/10.1007/s12155-022-10469-3

[41] Maity, S., Bose, S., Dokania, P., Lohar, S. and Sarkar, A., 2023. A comprehensive review of arsenic contamination in India with an emphasis on its detection through biosensors and bioremediation from the aqueous system. Environmental Quality Management. https://doi.org/10.1002/tqem.22100.

[42] Poddar, K., Sarkar, D., Bhoi, R. and Sarkar, A., 2024. Biotransformation of diclofenac by isolated super-degrader Pseudomonas sp. DCα4: Postulated pathways, and attenuated ecotoxicological effects. Environmental Pollution, Volume 344, 1 March 2024, 123388 p.123388. https://doi.org/10.1016/j.envpol.2024.123388

National Conference publication:

[1] Paul D, **Sarka**r **A**, Gupta KA. 2010. Molecular analysis of microbial diversity and community structure at arsenic contaminated ground water of West Bengal: culture-dependent and metagenomic approaches, Golden jubilee symposium on contemporary trends in plant and microbial sciences, March 19-20, Burdwan University, Burdwan, West Bengal, India.

[2] **Sarkar A** and Jayanthu S. 2017. Microbe-mediated Bioleaching of Value Added Products From Mine Tailing Stacks – A Critical Appraisal. National Seminer on Mining Technology for Safety Organized by the Indian Mining and engineering Journal (UGC Approved Journal) 22-23 December 2017, Bilaspur, Chhattisgarh.

[3] Dokania, P., Maity, S., Nayak, T., Jayantu, S. and Sarkar, A., 2023, October. Microbial and Biosorbent-Mediated Hexavalent Chromium Removal from the Tailing Waters Released from Chromite Mines. In Asian Mining Congress (pp. 337-344). Cham: Springer Nature Switzerland.

International Conference publication:

[4] **Sarkar A**, Kazy SK, Sar, P. 2011. Geomicrobiology of arsenic release in subsurface groundwater: a molecular microbiology approach. International Conference on Sustainable Water Resources Management and Climate Change Adaption. NIT Durgapur. ISBN: 978-93-80663-13-5, 265–278.

[5] Sar P, Paul D, **Sarkar A**, Kazy SK. 2014. Microbiology of arsenic contaminated groundwater. Souvenir & Mini Reviews in Proceeding of 55th Annual Conference on National Conference on Empowering Mankind with Microbial Technologies (AMI-EMMT-2014) organized by Association of Microbiologists of India (AMI), November 12nd -14th, Tamil Nadu Agricultural University, Coimbatore, 41-46.

[6] **Sarkar A**, Kazy SK, Sar P. 2011. Geomicrobiology of arsenic release in subsurface groundwater: a molecular microbiology approach. International Conference on Sustainable Water Resources Management and Climate Change Adaption. February17-19, NIT Durgapur, West Bengal, India.

[7] **Sarkar A**, Sar P. 2012. An investigation on arsenite oxidizing bacteria and arsenite oxidase gene (*aoxB*) in terms of evaluating their potential for groundwater arsenic bioremediation. Proceeding of 53rd Annual Conference of Association of Microbiologists of India (AMI), November 22nd -25th, KIT university, Bhubaneswar, Odisha.

[8] Paul D, **Sarkar A**, Kazy SK, Sar P. 2012. Bacterial community structure and composition in high arsenic contaminated ground water from West Bengal and microbial role in subsurface arsenic release. Proceeding of 14th International Conference of Microbial Ecology, August 19-24, Copenhagen, Denmark.

[9] Paul D, **Sarkar A**., Kazy SK, Sar P. 2012. Analysis of microbial community structure and function in arsenic contaminated ground water of West Bengal, India. Proceeding of Joint Genome Institute workshop in Genomics and Metagenomics, September 10–14, Walnut Creek, California, USA.

[10] Sar P, Paul D, **Sarkar A**, Kazy SK, Gupta KA. 2014. Culturable bacterial diversity, metabolic activity and role in arsenic mobilization in groundwater of West Bengal, India. Proceeding of 15th International Conference of Microbial Ecology, August 24-29, Seoul, South Korea.

[11] Mahapatra B, **Sarkar A**, Sar P. 2014. *Rhizobium* sp. novel: an n-alkane degrading dissimilatory arsenate respiring bacterium isolated from arsenic

contaminated groundwater of West Bengal, India. Proceeding of 55 rd Annual Conference on National Conference on Empowering Mankind with Microbial Technologies (AMI-EMMT-2014) organized by Association of Microbiologists of India (AMI), November 12nd -14th, Tamil Nadu Agricultural University, Coimbatore.

[12] **Sarkar A** and Sar P. 2014. Horizontal gene transfer of *ars* genes: A possible source of arsenic dissemination in subsurface environment. Journal of Environmental Research and Development (JERAD). Proceeding of 7th International Congress of Environmental Research (ICER-14) organized by R.V. college of Engineering, Bangalore India, in collaboration with Journal of Environmental Research and Development, Bhopal, December 26-28, 2014.

[13] **Sarkar A** and Sar P. 2015. Isolation and characterization of arsenite-oxidizing bacteria from arsenic contaminated groundwater to evaluate their potential in arsenic bioremediation. Proceeding of 2nd International Conference on Frontiers in Biological Science (InCoFIBS-2015), organized by Department of Life Science, National Institute of Technology, Rourkela, Odisha, India, January, 22-24, 2015.

[14] **Sarkar A**, Kazy SK, Roy A and Sar P. 2015. Molecular characterization and optimization of arsenite oxidation by *Achromobacter* sp. strain KAs3-5: potential for groundwater arsenic bioremediation. New Horizon in biotechnology (NHBT-2015). Trivandrum, India, November 22-25, 2015.

[15] Biswas R and **Sarkar A.** 2017. Isolation and characterization of arsenite oxidizing strains for their potential in arsenic bioremediation. Submitted to the upcoming conference, National Conference on Waste to Energy, Carbon Capture and Storage [NCWECCS-2017], National Institute of Technology Rourkela, Odisha during 3-5 August 2017. ISBN 81-85531-80-3.

[16] Gupta K, Maurya V, **Sarkar A.** 2017. Advancement of omics: New era in waste management. Submitted to the upcoming conference, National Conference on Waste to Energy, Carbon Capture and Storage [NCWECCS-2017], National Institute of Technology Rourkela, Odisha during 3-5 August 2017. ISBN 81-85531-80-3.

[17] Biswas R and **Sarkar A.** 2017. Isolation and characterization of arsenite oxidizing bacteria for their potential application in arsenic bioremediation from contaminated ground water. International Conference on Challenges in Environmental Science & Engineering CESE-2017, Kunming, China, 11-15 November 2017. ISBN 978-0-646-97914-4.

[18] Gupta K, Biswas R, Maurya V, **Sarkar A.** 2017. Advancement of omics: Future prospects for bioremediation of contaminated soils. International Conference on Challenges in Environmental Science & Engineering CESE-2017, Kunming, China, 11-15 November 2017. 978-0-646-97914-4.

[19] Biswas R and **Sarkar A**. 2017. Characterization and optimization of arsenite oxidizing strains for their potential in arsenic bioremediation. Presented in 'Bioprocessing India' held in Indian Institute of Technology, Guwahati during 9-11 December, 2017. ISBN 978-93-80813-60-8.

[20] Biswas R and **Sarkar A.** 2018. Isolation and characterization of arsenite oxidizing strains for their potential in arsenic bioremediation. Presented in '9th International Congress of Environmental Research' held in Amity University, Gwalior, Madhya Pradesh during 8-10 February, 2018. ISSN 0973-6921.

[21] Biswas R and **Sarkar A.** 2018. Elucidation of the potential role of arsenate reducing strains in sub-surface As-biogeochemical cycling. Presented in 'International Conference on Innovation and Translational Dimensions: Food, Health and Environmental Biotechnology' held in Motilal Nehru National Institute of

Technology (MNNIT) Allahabad, Uttar Pradesh during 9-11 March, 2018. 978-93-80635-38-5.

[22] Sarkar KD, **Sarkar A** and Kar SK. 2018. Biosensors for rapid detection of heavy metals in water system. Presented in 'International Conference on Innovation and Translational Dimensions: Food, Health and Environmental Biotechnology' held in Motilal Nehru National Institute of Technology (MNNIT) Allahabad, Uttar Pradesh during 9-11 March, 2018. 978-93-80635-38-5.

[23] Gupta K, **Sarkar A**. 2018. Isolation, characterization and optimization of ethanol producing bacteria from marine source using lignocellulosic waste. Presented in 'International Conference on Innovation and Translational Dimensions: Food, Health and Environmental Biotechnology' held in Motilal Nehru National Institute of Technology (MNNIT) Allahabad, Uttar Pradesh during 9-11 March, 2018. 978-93-80635-38-5.

[24] Biswas R and **Sarkar A**. 2018. A constitutive metagenomic approach to decipher the inherent microbial communities of arsenic contaminated groundwater of Bhojpur, Bihar. Presented in 'Biotechnological Research and Innovation for Sustainable Development' XV BRSI Convention held in Indian Institute of Chemical Technology (IICT) Hyderabad, Telengana during 22-25th November, 2018.

[25] Biswas R and **Sarkar A**. 2018. Elucidation of the potential role of arsenate reducing strains in sub-surface As-biogeochemical cycling. Presented in 'International Conference on Bioprocess for Sustainable Environment and Energy' held in National Institute of Technology Rourkela, Odisha during 6-8th December, 2018.

[26] Biswas R and **Sarkar A**. 2018. Adsorptive removal of arsenate from aqueous solution using Moringa oleifera as a natural biosorbent. Presented in 'Bioprocessing India' held in Indian Institute of Technology, Delhi during 16-18 December, 2018.

[27] Amulyasai B, **Sarkar A**, Biswas R, Sarkar D, Poddar K, Prajapati S and Padhan B. 2018. Microbial diversity analysis of hydrocarbon degrading bacteria. 59th Annual Conference of Association of Microbiologists of India And International Symposium on Host Pathogen Interactions organized by University of Hyderabad, Hyderabad, December 09-12, 2018.

[28] Prajapati S, **Sarkar A**, Sarkar D, Poddar K, Biswas R, Amulyasai B and Padhan B. 2018. Screening and isolation of ethanol producing bacteria from sewage water. 59th Annual Conference of Association of Microbiologists of India And International Symposium on Host Pathogen Interactions organized by University of Hyderabad, Hyderabad, December 09-12, 2018.

[29] Poddar K and **Sarkar A.** 2018. Extraction, purification and characterisation of pigment produced by bacterial strain isolated from waste water. Presented in International Conference on Biotechnological Research and Innovation for Sustainable Development (BioSD), Organised by: CSIR-IICT, Hyderabad in association with BRSI and IBA-IFIBiop, 22nd to 25th November.

[30] Poddar K and **Sarkar A.** 2018. Enrichment, isolation and characterisation of petroleum hydrocarbon degrading bacterial consortia from hydrocarbon contaminated soil. 'International Conference on Bioprocess for Sustainable Environment and Energy' held in National Institute of Technology Rourkela, Odisha during 6-8th December, 2018.

[31] Sarkar D and **Sarkar A.** 2018. Isolation and extraction of antibacterial substance produced by bacterial strain NAn1 isolated from waste water. Presented in International Conference on Biotechnological Research and Innovation for

Sustainable Development (BioSD), Organised by: CSIR-IICT, Hyderabad in association with BRSI and IBA-IFIBiop, 22nd to 25th November.

[32] Sarkar D and **Sarkar A.** 2018. Bioethanol production from fruit waste by bacterial isolates from waste water. 'International Conference on Bioprocess for Sustainable Environment and Energy' held in National Institute of Technology Rourkela, Odisha during 6-8th December, 2018.

[33] Gupta N, Kumari N, Poddar K, **Sarkar A**. 2018. Extraction of value added pigment from kitchen waste. International Conference on Challenges in Environmental Science & Engineering CESE-2018, Bangkok, Thailand, 4-8 November 2018. ISBN 978-0-646-99605-9.

[34] Gupta K, Sarkar D, **Sarkar A**. 2018. Production of ethanol by marine bacterium M1 using domestic waste. International Conference on Challenges in Environmental Science & Engineering CESE-2018, Bangkok, Thailand, 4-8 November 2018. ISBN 978-0-646-99605-9.

[35] Sengupta A and **Sarkar A**. 2020. Microbial In-situ Bioremediation of Hydrocarbon contaminated soil. International Conference on Advances in Bioprocess Engineering and Technology 2020, at Kolkata, India, during January 20-22, 2020.

[36] Sengupta A and **Sarkar A**. 2019. Synthesis of silver and iron nanoparticles using plant leaf extracts. International Conference on New Horizons in Biotechnology at Thiruvananthapuram, India, during November 20-24, 2019.

[37] Biswas R and **Sarkar A** 2019.A two- step approach for total arsenic removal using an inherent groundwater microorganism and neutralized red mud from aqueous solutions. 12th International Conference on Challenges in Environmental Science & Engineering (CESE-2019), Kaohsiung, Taiwan Nov'19.

[38] Biswas R, Maity S and **Sarkar A** 2019. Comparative assessment of heavy metals in potable drinking water sources in Bhojpur, Bihar. 12th International Conference on Challenges in Environmental Science & Engineering (CESE-2019), Kaohsiung, Taiwan Nov'19.

[39] Maity S, Biswas R and **Sarkar A** 2020, Dynamics of arsenic resistant microbial consortia stimulating arsenic bioremediation in deeper alluvial aquifer systems. 2nd International Conference on Advances in Bioprocess Engineering and Technology 2020 (ICABET 2020), on January 20-22, 2020.

[40] Maity S and **Sarkar A**. 2020.Optimization of pH for development of a Biosensor to detect Arsenic in groundwater. International Conference on Recent Advances in Biotechnology and Biochemistry organized by National Institute of Technology Raipur, Raipur, India from 08 - 09 Jan 2020.

[41] S Rahul, **Sarkar A** 2021, Insilco and Invitro screening of Microbial based potent inhibitors against SARS-COV-2 protease PLpro. International Conference on Biotechnology for Sustainable Agriculture, Environment and Health, jointly organized by MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY, JAIPUR and THE BIOTECH RESEARCH SOCIETY, INDIA at Jaipur, India during April 04-08, 2021.

[42] Poddar K, **Sarkar A** 2021, Bacterial degradation of contaminant dyes pharmaceutical in wastewater. International Conference on Biotechnology for Sustainable Agriculture, Environment and Health, jointly organized by MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY, JAIPUR and THE BIOTECH RESEARCH SOCIETY, INDIA at Jaipur, India during April 04-08, 2021.

[43] Sarkar D and **Sarkar A**. 2021, Comparative Evolution of fruit and vegetable waste as potential substrate for third generation bioethanol production. International Conference on Biotechnology for Sustainable Agriculture, Environment and Health, jointly organized by MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY, JAIPUR and THE BIOTECH RESEARCH SOCIETY, INDIA at Jaipur, India during April 04-08, 2021.

[44] Guddi K and Sarkar A. 2021, Production of pigment from bacteria. INTERNATIONAL CONFERENCE ON BIOTECHNOLOGY AND INTERDISCIPLINARY TECHNOLOGIES (iCBIT-2021) Chaitanya Bharathi Institute of Technology, Gandipet, Hyderabad, Telangana-500075. 8-12 th November, 2021

[45] Chakraborty, D., Poddar K., and Sarkar A. Biodegradation of paracetamol by bacterial consortia constructed by native bacterial strains of pharmaceutical wastewater. Biotechnology for Resource Efficiency, Energy, Environment, Chemicals and Health. 1-4, December 2021, organized by Indian Institute of Petroleum Dehradun

[46] Sarkar, D. and Sarkar A. Selection of fruit waste as a substrate for single step bioethanol production based on antinutrient content: A prospect unexplored. Biotechnology for Resource Efficiency, Energy, Environment, Chemicals and Health. 1-4, December 2021, organized by Indian Institute of Petroleum Dehradun.

[47] Pritam Bajirao Patil, Debapriya Sarkar, Kasturi Sarkar, Angana Sarkar (2022) Optimization and biorector studies for the polyhydroxyalkanoates production by soil isolate Bacillus sp. PhNs9. International conference on Biotechnology for sustainable bioresources and Bioeconomy, organized by Biotechnology Research Society of India and IIT Guwahati from 7th December to 11th December 2022.

[48] Pritam Bajirao Patil, Debapriya Sarkar, Kasturi Sarkar, Angana Sarkar (2022). Process optimization production of polyhydroxyalkanoates from sugarcane molasses by Pseudomonas sp PhNs10. International Conference on the Challenges in Environmental Science and Engineering (CESE-2022) at Dubai. 27th November to 1st December 2022.Organized by LJS Environment, Australia and Khalifa University, Dubai, UAE.

Books (Edited)

- "Cutting Edge Molecular Tools, Techniques & Applied Aspects in Waste Water Treatment", edited by Maulin Shah, Sukhendu Mandal, Angana Sarkar, originally published: 30 January 2021 by Elsevier Science Publishing Co Inc (EBook ISBN: 9780128218952, Paperback ISBN: 9780128218815)
- "Food, Medical, and Environmental Applications of Nanomaterials", edited by Prof Kunal Pal, Prof Angana Sarkar, Prof. Pritam Sarkar & Dr. Nandika Bandra & Prof Jega Jegatheesan will be published by Elsevier Science Publishing Co Inc. , 2022, ISBN: 978-0-12-822858-6, DOI: https://doi.org/10.1016/C2019-0-04943-6
- Sarkar, A. and Ahmed, I.A. eds., 2023. Microbial products for future industrialization. Springer Nature. https://doi.org/10.1007/978-981-99-1737-2
- "Processing of biomass waste: Technological upgradation and advancement", edited by Prof Angana Sarkar and Dr. Ulla Lassi, will be published by Elsevier Inc., (in progress)
- "Bio-refinery of wastewater treatment: way to generate waste to value" edited by Dr. Maulin Shah and Prof Angana Sarkar will be published by Elsevier Science Publishing Co Inc., (in progress)

- "Artificial Intelligence (AI): The new boom in tackling genetic diseases" edited by Dr.Tapash Rudra, Dr. Angana Sarkar, Dr. S. B. Goyal and Dr. Sandeep Kautish will be published by AMEIS De Gruyter Series (in progress)

Books Chapters contribution

[1] Sar P, Kazy SK, Paul D, **Sarkar A**. 2012. "Metal bioremediation by thermophilic microorganisms" in Thermophiles in Environmental Biotechnology, Satyanarayana, T., et al. (Eds) Springer science, New York, pp. 171–200. ISBN 978-94-007-5899-5.

[2] Sar P, Paul D, **Sarkar A**, Bharadwaj R, Kazy SK., 2014. "Microbiology of arsenic contaminated groundwater" in Microbiology for Minerals, Metals, Materials and Environment, Pandey A, B.D. and Natarajan K.A., (Eds) CRC Press, (ISBN 9781482257298) Chapter 19, pp.478-525.

[3] Sar P, Mohapatra B, Ghosh S, Paul D, **Sarkar A**, and Kazy SK. 2017. "Geomicrobiology of arsenic-contaminated groundwater of Bengal Delta Plain." In Handbook of Metal-Microbe Interactions and Bioremediation, CRC Press. Edited by Surajit Das, Hirak Ranjan Dash. pp. 333-353. https://doi.org/10.1201/9781315153353

[4] Biswas R. and **Sarkar A**. 2018. 'Omics' Tools in Soil Microbiology: The State of the Art. In Advances in soil microbiology: recent trends and future prospects Springer, Singapore, pp. 35-64. DOI: 10.1007/978-981-10-6178-3_3.

[5] **Sarkar A**, Gupta N, Kumari N. and Gupta K. 2018. Microbial Interaction with Metals and Metalloids: A Prospective Clean Environment. In Microbial Biotechnology, Springer, Singapore, pp. 307-342.

[6] Sarkar D, Poddar K., **Sarkar A.** 2019. Plant Metabolites As New Leads To Drug Discovery- Approaches And Challenges In: Medicinal Plants: Chemistry, Pharmacology, and Therapeutic Applications, 1st Edition, Taylor & Francis Group. ISBN 9780367111724 - CAT# K407127, Published May 17, 2019

[7] Sarkar D, Poddar K, **Sarkar A**. 2019. Nano-toxicity: Sources and Effects on Environment In: Microbial Nanobionics: Basic Research and Applications, Volume 2, Edited by R Prasad. Springer. ISBN 978-3-030-16533-8, 2019

[8] **Sarkar A**, Sarkar KD, Amrutha V, Dutta K. 2019. An overview of enzyme-based biosensors for environmental monitoring in Tools, Techniques, and Protocols for Monitoring Environmental Contaminants. Satinder Kaur Brar Krishnamoorthy Hegde Vinayak Pachapur, Elsevier. ISBN: 9780128146798, 5th June 2019, DOI:10.1016/B978-0-12-814679-8.00015-7

[9] Daverey A, Dutta K, Sarkar A, 2019. An overview of analytical methodology for environmental monitoring in Tools, Techniques, And Protocols For Monitoring Environmental Contaminants edited by Satinder Kaur Brar Krishnamoorthy Hegde Vinayak Pachapur. Elsevier. Elsevier. ISBN: 9780128146798, 5th June 2019. https://doi.org/10.1016/B978-0-12-814679-8.00001-7.

[10] **Sarkar A**, Aravind KR, Giridharan M, Ajanth Praveen M. 2019. Membrane Bioreactor Technologies in Wastewater Treatment in New Horizons in Wastewaters Management: Emerging Monitoring and Remediation Strategies. Nova Science Publishers. ISBN: 978-1-53615-659-1

[11] Maity S, Sinha D, **Sarkar A**. 2019. Waste Water and Industrial Effluent Treatment by using Nanotechnology in Nanomaterials and Environmental

Biotechnology" In book: Nanomaterials and Environmental Biotechnology, pp.299-313, February 2020, Springer Nature, DOI: 10.1007/978-3-030-34544-0_16 ·

[12] Prajapati S, Padhan B, Amulyasai B, **Sarkar, A**. 2019. Recent Advancement in Nanomaterials based Biosensors in Biopolymer based formulations: Food and biomedical applications. Elsevier Publisher. Paperback ISBN: 9780128168974. ISBN: 978-0-12-822858-6, DOI: https://doi.org/10.1016/C2019-0-04943-6.

[13] **Sarkar A**, Prajapati S, Amulya Sai B, Khatoon A, Raghavarapu S, Kumar S, Behera A and Pradhan R. 2019. Diversity analysis of Indian Mangrove Organisms to explore their potential in novel and value-added biomolecules in Ethnopharmacology and Biodiversity of Medicinal Plants" edited by Patra, J. K., Das, G., Kumar, S., & Thatoi, H., 2019, CRC Press, ISBN: 9781771887731, 31-53.

[14] Poddar, K., Sarkar, D., & Sarkar, A. (2020). Nanoparticles on Photosynthesis of Plants: Effects and Role. In Green Nanoparticles (pp. 273-287). Springer, Cham. Chapter 13, DOI: 10.1007/978-3-030-39246-8_13, ISBN 978-3-030-39245-1

[15] Maity, S., Biswas, R., Verma, S. K., & Sarkar, A. (2021). Natural polysaccharides as potential biosorbents for heavy metal removal. In Food, Medical, and Environmental Applications of Polysaccharides (pp. 627-665). Elsevier. Chapter 21 https://doi.org/10.1016/B978-0-12-819239-9.00012-9, ISBN: 978-0-12-819239-9.

[16] Gupta, K., Biswas, R., & Sarkar, A. (2020). Advancement of Omics: Prospects for Bioremediation of Contaminated Soils. In Microbial Bioremediation & Biodegradation (pp. 113-142). Springer, Singapore. Chapter-5, DOI: 10.1007/978-981-15-1812-6_5, ISBN: 978-981-15-1812-6.

[17] Kumbhar, P., Savla, N., Banerjee, S., Mathuriya, A.S., Sarkar, A., Khilari, S., Jadhav, D.A. and Pandit, S., 2021. Microbial Electrochemical Heavy Metal Removal: Fundamental to the Recent Development. In Wastewater Treatment (pp. 521-542). Elsevier. DOI:10.1016/B978-0-12-821881-5.00026-X.

[18] Gupta, T., Chakraborty, D., & Sarkar, A. (2021). Structural and Functional Rhizospheric Microbial Diversity Analysis by Cutting-Edge Biotechnological Tools. In Omics Science for Rhizosphere Biology (pp. 149-170). Chapter 9, Springer, Singapore. 10.1007/978-981-16-0889-6_9, ISBN 978-981-16-0888-9.

[19] Sarkar, D, Poddar K, Verma N, Biswas S, and Sarkar A., 2020. "Bacterial quorum sensing in environmental biotechnology: a new approach for the detection and remediation of emerging pollutants." In Emerging Technologies in Environmental Bioremediation, pp. 151-164. Elsevier, 2020. https://doi.org/10.1016/B978-0-12-819860-5.00006-7. ISBN: 978-0-12-819860-5

[20] Sengupta, A., Barik, A., Verma, S. K., & Sarkar, A. (2020). Industrial applications of enzymes derived from Indian mangroves. Biotechnological Utilization of Mangrove Resources, 331-353 Academic Press.ISBN 978-0-12-819532-1. https://doi.org/10.1016/C2018-0-05114-2

[21] Kumbhar, P., Savla, N., Banerjee, S., Mathuriya, A.S., Sarkar, A., Khilari, S., Jadhav, D.A. and Pandit, S., 2021. Microbial electrochemical heavy metal removal: fundamental to the recent development. In Wastewater treatment (pp. 521-542). Elsevier. DOI:10.1016/B978-0-12-821881-5.00026-X. ISBN: 9780128218815

[22] Patil, P. and Sarkar, A., 2021. New Strategies for Commercialization of Microbial Technologies. In Microbiological Activity for Soil and Plant Health Management (pp. 583-597). Springer, Singapore. 10.1007/978-981-16-2922-8_23' ISBN: 9789811629242.

[23] Guddi, K. and Sarkar, A., 2022. Microbial degradation of dye-containing wastewater. In Development in Wastewater Treatment Research and Processes (pp. 159-175). Elsevier. ISBN 978-0-323-85839-7, DOI: https://doi.org/10.1016/C2020-0-02500-4.

[24] Sarkar, D., Hansdah, R., Kar, A. and Sarkar, A., 2022. Microbial bioprospecting in development of integrated biomass based biorefineries. In Bioprospecting of Microbial Diversity (pp. 257-275). Elsevier. ISBN; 978-0-323-90958-7' DOI: https://doi.org/10.1016/C2020-0-02861-6

[25] Biswas, R. and Sarkar, A., 2022. Microbes: Key Players of the Arsenic Biogeochemical Cycle. In Microbial Metabolism of Metals and Metalloids (pp. 197-221). Springer, Cham., ISBN: 978-3-030-97185-4, DOI' https://doi.org/10.1007/978-3-030-97185-4

[26] S. Bose, S. Maity, A. Sarkar, Nano-materials as biosensor for heavy metal detection, In Food, Medical, and Environmental Applications of Nanomaterials (2022) 493-526. ISBN 978-0-12-822858-6, https://doi.org/10.1016/C2019-0-04943-6. Elsevier.

[27] Patil, P.B., Sarkar, D. and Sarkar, A., 2023. Clean energy production by microorganisms: A sustainable approach. In Relationship Between Microbes and the Environment for Sustainable Ecosystem Services, edited by Jastin Samuel, Ajay Kumar and Joginder Singh Volume 3 (pp. 1-14). Elsevier. https://doi.org/10.1016/B978-0-323-89936-9.00006-0, ISBN 978-0-323-89936-9

[28] Patil, P. and Sarkar, A., 2022. Omics to Field Bioremediation: Current Status, Challenges, and Future Opportunities. In Omics for Environmental Engineering and Microbiology Systems (pp. 1-17). CRC Press. ISBN: 9781003247883, https://doi.org/10.1201/9781003247883

[29] Dokania, P., Fopase, R., Swagathnath, G., Vivekanand, Gupta, K., Pabari, P., Sahoo, K.K. and Sarkar, A., 2023. Future Marine Microbial Products for the Pharmaceuticals Industry. In Microbial products for future industrialization (pp. 199-221). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-1737-2_11, ISBN 978-981-99-1736-5

[30] Sarkar, D., Bhoi, R. and Sarkar, A., 2023. Bioethanol Production from Microbial Fermentation of Prospecting Biomass. In Microbial products for future industrialization (pp. 143-155). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-1737-2_8 ; Print ISBN 978-981-99-1736-5

[31] Dokania, P., Nayak, T., Chawdhury, S.R. and Sarkar, A., 2023. Microbial Product Commercialization from Lab to Industry. In Microbial products for future industrialization (pp. 1-15). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-1737-2_1; Print ISBN 978-981-99-1736-5

[32] Dokania, P., Roy, S., Chawdhury, S.R. and Sarkar, A., 2023. Advanced Recombinant DNA Technology (RDT) for Improved Microbial Product Formation.

In Microbial products for future industrialization (pp. 315-330). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-1737-2_16; Print ISBN 978-981-99-1736-5

[33] SenSharma, S., Kumar, G. and Sarkar, A., 2023. Immobilized enzyme reactors for bioremediation. In *Metagenomics to Bioremediation* (pp. 641-657). Academic Press. https://doi.org/10.1016/B978-0-323-96113-4.00021-4, 978-0-323-96113-4

[34] Gupta, T., Chakraborty, D. and Sarkar, A., 2023. Microbial enzymes and role in bioremediation of environmental pollutants: prospects and challenges. Microbial Degradation and Detoxification of Pollutants, 2, p.217.

[35] Bhoi, R., Shrivastava, A. and Sarkar, A., 2024. Study of microbial communities in degrading toxic pollutants in the wastewater and solid waste treatment industries. In Functional Metagenomics (pp. 205-223). Academic Press.

Professional Training & Experience:

- Teaching Assistant in Microbiology, Molecular biotechnology and Bioinformatics class in Dept. of Biotechnology, IIT-Kharagpur, 2008 -2014.
- Assistance in the management event of QIP Short term course sponsored by AICTE on **"Environmental Genomics and Biotechnology"** offered by IIT Kharagpur. December 2nd – 9th, 2011.
- Worked as Instructor at the National workshop on Bioinformatics in **"Genomics and Proteomics"**, Dept. of Biotechnology, IIT – Kharagpur, 2009
- Worked as instructor in International Summer and Winter Term course on **"Genomics, Metagenomics and Metabolic Engineering"** from December 08-December 18, 2014 sponsored by IIT Kharagpur.
- Short Term Training Program on **APPLICATIONS OF BIOINFORMATICS IN BIOTECHNOLOGY(ABB-2016)** (17th February to 21st February 2016) as Co-covenor.
- Invited talk on Molecular tools required for the screening of organism and molecular characterization in **TEQIP-II sponsored STTP on Bioprocess Development, Reactor, design and Analysis**, NIT Raipur 12.01.2017.
- Convener for International Conference on Bioprocess for Sustainable Environment and Energy (ICBSEE) – 2018, 6th to 7th December, 2018, National Institute of Technology, Rourkela.
- Convener for 2nd International Conference on Bioprocess for Sustainable Environment and Energy (ICBSEE) – 2020, 5th to 7th March, 2020, National Institute of Technology, Rourkela.
- Expert talk on "**Microbial fermentation of fruit waste to Bioethanol: future prospects and hurdles"** in e-FDP cum workshop on "**Waste-to-Bioenergy**'' (28th June- 4th July 2020) organized by Sharda University, NCR, India and Maharashtra Institute of Technology, Aurangabad, India.
- Expert talk on "**Bioremediation strategies for arsenic contaminated water"** in online 5-day Faculty Development Program (FDP) cum Training Workshop from 13-17 July, 2020 on **''ENVIRONMENT, WATER AND DISASTER RISK REDUCTION''** Organized by Sharda University, NCR in collaboration with National Institute of Disaster Management (NIDM), Ministry of Home Affairs, New Delhi.

- Convener for organizing Online 5-day e-Faculty Development Program (FDP) cum Workshop (e-FDP-TWER) from 9-13 December, 2020 on '**Technologies for Waste to Energy & Resources''**
- Invited speaker in the **International Conference on Biotechnology for Resource Efficiency, Energy, Environment, Chemicals and Health 2021 (BREEECH-2021)**, 1-4th December, IIPR Dehradun. Topic: **Waste to Ethanol: Promising approach by bacterial fermentation.**
- Poster presentation in the **14th International Conference on Challenges in Environmental Science and Engineering (CESE-2021**), 6-7th November, 2021, Melbourne, Australia, Topic: **Isolation, screening and characterization of Polyhydroxyalkanoates producing strains from different waste disposal areas of Rourkela.**
- Oral presentation in the **14th International Conference on Challenges in Environmental Science and Engineering (CESE-2021**), 6-7th November, 2021, Melbourne, Australia, Topic: **Arsenic contamination in India with its detection through biosensor and bioremediation from the aqueous system: A complete review.**
- **Delivering lecture as a resource person in the three days international conference on Current Trends in Waste Treatment, Reuse & Valorisation-ICWRV 2022, organized by, School of Science, Sandip University, Nashik, in collaboration with Society for Green Environment, INDIA held virtually on 25th to 27th July 2022.**
- Convener for **3rd International Conference on Bioprocess for Sustainable Environment and Energy (ICBSEE) – 2022**, 20th to 24th June, 2022, National Institute of Technology, Rourkela.
- Oral presentation in the **15th International Conference on Challenges in Environmental Science and Engineering (CESE-2022**), 27th November-1st December, 2022, Dubai, UAE, Topic: **Process optimization production of polyhydroxyalkanoates from sugarcane molasses by Pseudomonas sp PhNs10.** Organized by LJS Environment, Australia and Khalifa University, Dubai, UAE.
- Poster presentation in the **15th International Conference on Challenges in Environmental Science and Engineering (CESE-2022**), 27th November-1st December, 2022, Melbourne, Australia, Topic: **Optimization and techno-economic analysis of a newly developed extraction process for lignocellulosic biomass from banana peel. Organized by LJS Environment, Australia and Khalifa University, Dubai, UAE. Renupama Bhoi, Debapriya Sarkar, Angana Sarkar**
- **Delivering expert talk on "Microbial synthesis of biodegradable poly-hydroxy-alkanoates (PHAs) for its future application as green composite" in the Five days workshop on Advances in Natural Fiber Reinforced Polymer Composites (ANFRPC-2023) from 24th -28th April, 2023 at NIT Rourkela, Odisha.**
- **Delivering expert talk entitled " Arsenic in drinking water: Detection and mitigation strategies " in the 5 Day Workshop on "Technological Emergence for Clean Water and Air" (TECWA-2023) from 29th May to 2nd June 2023 at NIT Rourkela, Odisha.**
- **Delivering talk on " Waste to bioethanol: a biorefinery approach" as Guest Speaker at the SERB sponsored High End Workshop (KARYASHALA) on "Technical Insights of Ethanol Fermentation: 1G & 2G" organized by the Dept. of Food Process Engineering, NIT Rourkela, Odisha held from**

27/01/2023 to 31/01/2023.

Sponsored Research Projects

S. No.	Title of Project	Funding Agency	Date of sanction and Duration
1	Molecular characterization of arsenic (As) transformation mechanisms of arsenite oxidizing bacteria isolated from contaminated groundwater of Bihar to elucidate their potential application in As bioremediation	DST	28.03.16, 3years
2	Exploitation of arsenite oxidizing bacteria in development of pH dependent bio-sensor for rapid arsenic detection	DST	Nov 24, 2016 3years
3	Construction of pH based arsenic bio-sensor using engineered arsenite oxidizing strain	*TEQIP Phase* II	26th September,2016 1 year
4	Integrated Solar photocatalytic and biological treatment of pharmaceutical waste	*SERB-IMPRINT*	3 years
5.	Multi-step improvement of Enterobacter sp. EtK3 strain in order to obtain higher ethanol yield from cellulosic fruit waste: single step for waste to energy	*SERB*	15-Feb-2021 3Years
6	Molecular phylogeny of microbial assemblages of the seawater cooling system of a nuclear power plant	201910FRR08RP06094-BRNS	18th July, 2022 3 years

Consultancy Project:

- As Co-PI: Design of dump with 25% fly ash and 75% overburden materials of to JPOCCM mine at Raigarh, SECL, 20 Jun 2019 - 15 Jul 2021, SECL.
- Prof. Angana Sarkar and Prof Singam Jayanthu: CONSULTANCY SERVICE & SCIENTIFIC STUDY FOR HEXAVALENT CHROMIUM REDUCTION AT OSTAPAL MINES (PO No. 4800020530), 13.12.2021 To 31.07.2022, OSTAPAL : KALIAPANI JAJPUR Orissa 755047 India), Rs. 624220/-

Patent filed:

RAPID ARSENIC DETECTION TEST KIT FOR AQUEOUS SYSTEMS (Filed) by Sourav Maity and Angana Sarkar. Application ID: 202231027806, dated 14.05.2022

Techniques known:

Microbiological and Molecular biological techniques: DNA isolation and purification from environmental sample (water, sediments and soil) and Bacteria. Polymerase chain reaction (PCR), *Restriction fragment length polymorphism* (RFLP) fingerprinting, Denaturing Gradient Gel Electrophoresis (DGGE) fingerprinting, *Amplified Ribosomal DNA Restriction Analysis(*ARDRA), Agarose and *Polyacrylamide* gel electrophoresis (PAGE), Gel purification, PCR purification, Plasmid isolation, Cloning and transformation, Restriction digestion and DNA sequencing and sequence analysis, Metagenome analysis, Isolation of pure cultures, 16S rRNA gene analysis, Microbial culture characterization, Microbiological techniques, Enrichment, isolation, identification and characterization of bacteria, Biochemical and 16SrRNA based identification of bacteria, PCR-based molecular phylogenic analyses and identification of microbes using ribosomal RNA genes. Study of gene expression levels by real time PCR, Proteomic analysis by 2D GEL Electrophoresis. Next Generation Sequencing analysis, Whole genome sequencing analysis.

High throughput Instruments used:
Scanning electron microscope (SEM), Energy Dispersive Spectrometer (EDS/EDAX), X-ray diffractometer (XRD), Atomic absorption spectrophotometer (AAS), X-ray fluorescence (XRF) spectrometer, Inductively coupled plasma mass spectrophotometer (ICP-MS), 2D Gel electrophoresis instrument, Phase contrast microscope, Bright field and fluorescence microscope, Gradient Thermo-Cycler, *Real-time PCR Machine, Capillary Sequencing Machine*,Gass Chromatography (GC).

Bioinformatics: Expertise in Phylogenetic analysis in various phylogenetic tool packages [NCBI tool kit, Bioinformatics related to genomics specially Skills in BioEdit, MEGA 5, *Interactive Tree Of Life (ITOL),Ez Taxonetc.]*,*Sequence chromatogram analysis using* Chromas, Ribosomal Database Project (RDP) tool kit, Greengenes tools, Genome Online Database (GOLD), Analysis of protein structure and conserved domain using online packages (ESPript, *ExPASy, PSIPRED,etc.). Design of primers (Primer3, NCBI Primer design tools etc.),Next Generation Sequencing (NGS) analysis (using CHIME, RAST, MGRAST etc.), Whole Genome Sequencing analysis.*

Statistical software packages: Origin, Statistical Package for the Social Sciences (SPSS) and MultiVariate Statistical Package (MVSP).

TEACHING EXPERIENCE (Subject/s Taught/Teaching)

- Environmental Biotechnology (UG)
- Fermentation Technology (UG)
- Engineering Mass Transfer (UG)
- Bioprocess Engineering (UG)
- Microbiology (UG)
- Environmental Biotechnology Laboratory (UG)
- Bioreactor Designing Laboratory (UG)
- Cell & Molecular Biology Laboratory (UG)
- Industrial Microbiology (PG)
- Advanced Recombinant DNA Technology (PG)