RESUME

Dr. AMRITA SAHA

(M.Sc, M.Phil, Ph.D)

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WORK EXPERIENCE

Amity University, Kolkata, Department of Environmental Sciences, Amity School of Engineering & Technology and Allied Sciences **Sept'15 onwards**

Designation: Assistant Professor Grade II & Head

Centre of Excellence on Environmental Technology and Management, West Bengal University of Technology, Kolkata **Dec 14- Aug'15**

Designation: Research Associate

Department of Biotechnology, West Bengal University of Technology, Kolkata **Jan 13- May 14**

Designation: Senior Research Fellow
ICAR Project: Genetic manipulation based enhancement of microbial phosphate and nitrate remediation for waste water treatment

Department of Environmental Studies, RabindraBharati University, Kolkata **Sept 12-Dec 12**

Designation: Guest Lecturer

Environmental Science Department, University of Kalyani, Kalyani **June 09-Aug 12**

Ph.D(Environmental Sc.) awarded 2013
Ph.D Topic:Biochemical and Molecular Characterization of Bacterial Consortium of Municipal Solid Wastes

ENVIS Centre on Environmental Biotechnology **Oct 08-June 09**
(Supported by Ministry of Environment and Forest)

Employer: University of Kalyani, Nadia, West Bengal.
Designation: Information Officer

Sikkim Manipal University and Scientific (Distance Education) and Environmental Reasearch Institute, Khardaha, Kolkata **Sept 06-Feb07**

Designation: Part Time Faculty and Laboratory Trainer.

PRESENT ROLE & RESPONSIBILITIES

- Head of the Department (Environmental Science) since 2015 till date
- Anti Raggimg Committee Member, Cultural Committee Member, Food Committee member, Hygiene Committee Member since 2015
- Examination Core Committee member since 2017
- Successfully conducted and coordinated University Cultural programmes
- Administrative work experience since 2015
- Developed Industry- Institute partnerships
- Moderator and External Examiner of other Universities

ACADEMICS & PROFESSIONAL DEVELOPMENT

Ph.D(Environmental Sc.) 2013
Dept. of Environmental Science, University of Kalyani.

M. Phil. (Environmental Sc.) 2007
Dept. of Environmental Science, University of Kalyani. *Percent: 73.8%*

M.Sc. (Environmental Sc.) 2006
Dept. of Environmental Science, University of Kalyani. *Percent: 72.4%*
(Specialization: Environmental Biotechnology & Molecular Toxicology)

B.Sc. (Microbiology, Honours) 2004
SurendraNathCollege, University of Calcutta. *Percent: 58.5%*
(Pass Papers: Physics & Chemistry)

PROJECTS

1. **Title:*"Genetic manipulation based enhancement of microbial phosphate and nitrate remediation for waste water treatment" (***ICAR sponsored, Project Code: NFBSFARA/GB-2019/2011-12***)**

   Department of Biotechnology, West Bengal University of Technology, (1 Year, 4 Months), 2013-2014.

   Work Done (Post Doctoral): Operation of a 5 litre suspended bed bioreactor and a 9 litre packed bed bioreactor with a nitrate and phosphate sequestering microbial consortia acclimatized in waste water with carbon source, in both batch and continuous mode. The unique property of the consortia of being able to sequester nutrients within 2 hours with associated COD and BOD reduction in the 9 litre packed bed bioreactor was worked out. Optimization of the running condition of the 9 litre bioreactor was carried out using response surface methodology. The operation was further scaled up to 78 litre bioreactor for treating larger volume of agricultural effluent. The isolates and the consortium used for both nitrate and phosphate sequestration from waste water were tested for PGPB traits in mung bean in both pot and field trial. Mung bean pot trial was conducted with and without biofertilizer where irrigation was done with tap water, waste water (influent of Bioreactor) and with the treated waste water from the bioreactor (effluent). The initiation of germination as well as the seed yield showed enhancement with reuse of treated water. The inoculum volume for application of isolates and consortia for pot and field application was also determined. Samples of the nitrate and phosphate accumulating bacteria were prepared for TEM analysis. Some part of the insilico analysis of the strains were worked out.

   Apart from this, ammonia production from dairy strains and sulphate bioremediation using Sulphate Reducing Bacteria in a 72 litre packed bed bioreactor, have been worked out, as per requirement.

   Publications:

   1. RayChaudhuri S, Saha A, Ghoshal T, Thakur AR (2013). Draft genome sequence of ammonia-producing *Aeromonas*sp. MDS8 strain MCC2167 from sludge of a dairy effluent treatment plant.

Genome Announc. 1(5):e00710-13. doi:10.1128/genomeA.00710-13.

2. Ghoshal T, Ghosh S, Saha A, Haldar N, Thakur AR, Ray Chaudhuri S (2014). Combination of conventional and in-silico approach for identifying an industrially important isolate of *Aeromonas*. OnLine J. Biol. Sci., 14: 70-83.
3. 2 manuscripts are under preparation and one has been sent to us for revision.

2. Title:*Biochemical and Molecular Characterization of Bacterial Consortium of Municipal Solid Wastes.*

Department of Environmental Science, University of Kalyani (3 Years), 2009-2012.

Work Done (Ph.D): Potent and hyperactive enzyme producing strains were screened from municipal solid waste (Barrackpore Municipality Waste Dumping Site and Dhapa Waste Dumping Site), their

characterization, optimization of enzyme production and application of the isolates in degradation of the municipal solid organic waste were carried out. BM1 [*Paenibacillusmucilaginosus; s-4 (*GenBank accession no. is **MTCC 11281***)*showed production of protease and lignin peroxidase enzyme both of which have high market values. Both the enzyme (protease and lignin peroxidise) production was optimized in sub merged and solid state fermentation. Agricultural residue (rice straw) was screened as substrate for enzyme production in solid state fermentation. Response surface methodology(RSM) was successfully employed to achieve an overall 2.07 folds increase in protease production and 2.22 folds increase in lignin peroxidise production.Such high enzyme yields for protease and lignin peroxidase with such optimum conditions have not been reported earlier in bacterial batch fermentations as far the author's knowledge. The protease enzyme was subjected to purification and characterization. Cytochrome C proved to be the best substrate for its activity. After final purification step, the enzyme was purified 10-folds with an increase in specific activity from 15.222.685 to 1,58,220.430 U/mg protein.Individual isolates and consortium of the selected strains were applied in suspension for bioconversion of municipal solid organic waste. Consortium of BM3 and D5, as well as BM2 as an individual isolate have very good degradation ability. So, BM1, BM2, BM3 and D5 were the four potent strains which were subjected to molecular characterization for further information.

- **Biochemical and molecular Characterization of the isolates and quantification of protease production:**Worked out**under the guidance of Dr. Shaon Ray Chaudhuri,** Biotechnology Department, West Bengal University of Technology, Salt Lake City, Kolkata, West Bengal, India.
- **Quantification and Optimization of protease and lignin peroxidase production, purification and characterization of protease:** Worked out **under the guidance of Prof.Rintu Banerjee**, Agricultural and Food Engineering Department, IIT Kharagpur, West Bengal, India.

Publications:

1. Saha A, Santra SC (2011). Isolation and characterization of solid waste decomposing bacteria – a screening trial, Sustainable Waste Management, pp. 534-541. ISBN: 81-86862- 41 – 2.

2. Saha A, Santra SC (2014). Isolation and Characterization of Bacteria Isolated from Municipal Solid Waste for Production of Industrial Enzymes and Waste Degradation. J MicrobiolExp 1(1): 00003.

3. **Title:*Isolation of Litter Decomposing Fungi in the Perspective of its Application in Biocomposting*.**

Department of Environmental Science, University of Kalyani, (1year), 2006-2007.

Work Done (M.Phil): Kitchen waste was collected and fungi were isolated out of it. Microbiological characterization of the isolated fungi were carried out. Heavy metal tolerance and antibiotic sensitivity of the isolates were analyzed. Isolated fungi both as individual isolates and consortia were employed for testing their kitchen waste degradation ability through weight loss method.

4. **Title:** ***Isolation and Characterization of Lignin Hydrolyzing Microorganisms***.

Department of Environmental Science, University of Kalyani, (6Months), 2005-2006.

Work Done: Degradedsaw mill dust was collected and was used as a sample for isolation of lignin hydrolyzing microorganisms.A few lignin hydrolyzing bacteria was isolated and characterization of the isolates were carried out.

SEMINARS/ SYMPOSIUM/WORKSHOP/ TRAINING ATTENTED

1. **One day seminar on World Water Day – 2019 organized by Bengal National Chamber of commerce & Industry supported by CGCRI.**

2. **Invited for Consultancy in Quaker Chem India Pvt. Ltd to resolve their Biofilm contamination problem in Metal cutting Fluid**
3. **5 days Theoretical & Practical course on Development of Enzymes and Microbial Technologies for Clean Energy in ICGEB, New Delhi, Funded & Supported By: DBT, India**
4. **Took a session on RAST analysis of draft genomes in A workshop on Advanced Microbial Waste water Treatment is being organized by the Centre of Excellence in Environmental**

Technology and Management at WBUT (renamed MAKAUT, WB) for the students/scholars/faculty of North East India

5. **2 weeks Summer Work Shop Series - 11th Biofilm Summer School, organized by The Gene and Linda Voiland School of Chemical Engineering and Bioengineering, Washington State University, Pullman, Washington, USA, 2015**

   a. **Work shop-1:*2 Days workshop on Fundamentals of Biofilm Research, Biofilm Structure Quantification and Image Analysis***

   b. **Work shop -2:*3 Days workshop on Electrochemically Active Biofilms***

   c. **Work shop - 3:*5 Days workshop on Microsensors: Manufacture and Applications***

6. ***3 Days Winter School in Microbial Technology for Waste Water Management***, organized by Centre of Excellence in Environmental Technology, West Bengal University of Technology, West Bengal, India, 2015

7. ***6 Days Short Term Training on Mathematical Biology(Pelackett-Burman Design for Bioreactor Optimization)*** organized by Centre of Excellence in Environmental Technology (along with IBM Laboratory), West Bengal University of Technology, West Bengal, India, 2014

8. 14. ***1 Day Short Term Training on Mathematical Biology(Application of Matlab in Life Sciences)*** organized by Centre of Excellence in Environmental Technology, West Bengal University of Technology, West Bengal, India, 2014

9. 15. ***1 Day Training on Differential Equation in Biology*** organized by MHRD Sponsored, Centre of Excellence in Environmental Technology, West Bengal University of Technology, West Bengal, India, 2014

10. ***1 Day Short Term Training on Mathematical Biology*** (Pelackett-Burman Design for Bioreactor Optimization) organized by Centre of Excellence in Environmental Technology, West Bengal University of Technology, West Bengal, India, 2014

11. ***3 Days National Symposium on Live Organisms and their Expression in the Environment,*** in University of Calcutta (Technology Campus), West Bengal, India, 2012.

12. ***3 Days International conference on Solid Waste Management and Exhibition (Iconswm 2011),*** in Jadavpur University, India in 2011

13. ***1 Day Seminar on Chronic Arsenicosis-A Public Healthy Concern in West Bengal***, Environmental Science Department, University of Kalyani, West Bengal, India in 2010.

14. ***3 Days symposium on International Conference on Energy, Environment and Development from Stockholm to Copenhagen and Beyond,*** in Environmental Science Department, Sambalpur University, India in 2010

15. ***1 day symposium on Frontiers in Electron Microscopy*** in West Bengal State University, West Bengal, India in 2010

16. ***"Winter School on biodiversity and efficiency assessment of agriculturally important microorganisms"*** in Division of microbiology in I.A.R.I. Pusa, New Delhi, India, 21 Days, 2009.

17. ***2 Days User Awareness Pprogramme on INFLIBNET,*** Department of Library and Information Science, University of Kalyani, West Benagal, India in 2009

18. ***3 days workshop cum Training programme on Computational Biology(Bioinformatics)*** supported by D.B.T in university of Kalyani, west Bengal, India in 2009

19. ***3 days training programme on Intellectual Property rights with Special Emphasis on Microorganism and Plant Variety Protection*** sponsored by DST, Govt. of India in University of Kalyani, West Bengal, India in 2009.

20. ***1 Day National Seminar on Biodiversity, Water Resource and Climate Change Issues***, Environmental Science Department, University of Kalyani, West Bengal, India in 2009.

TECHNIQUES KNOWN / TECHNICAL EXPERIENCE

Bioreactor Operation, Application of PCR, Gel electrophoresis, SDS PAGE, High Volume Sampler, Mercury Analyzer,Atomic Absorption Spectrophotometry, Fluorescence Microscope, Chromatographic techniques and all other general microbiological, environmental and biochemical analysis techniques, MATLAB, Computation Biology

MEMBERSHIP / AWARDS

- Member of American Society for Microbiology (ASM ID -**57330375**)
- Awarded financial support (travel & registration) for attending11th Biofilm Summer School (27.07.2015 to 07.08.2015) at Washington State University, Pullman, WA, USA from Science & Engineering Research Board, SERB, a statutory body under Department of Science & Technology, Govt. of India.
- Awarded Travel Support (accommodation)for attending 11th Biofilm Summer School (27.07.2015 to 07.08.2015) at Washington State University, Pullman, WA, USA from Centre of International Co-operation in Science (CICS), (Promoted by Indian National Science Academy, New Delhi in association with Scientific Agencies & Departments).

COMPUTER KNOWLEDGE

Completed CWC Course (Six Months semester course on GNIIT) from NIIT.

Windows98, Windows XP, JAVA, MS Office, Internet.

PUBLICATIONS

1. Saha, Amrita & Bhushan, Shashi & Mukherjee, Pallavi & Chanda, Chaitali & Bhaumik, Moumita & Ghosh, Madhurima & Sharmin, Jaweria & Datta, Poulami & Banerjee, Srimoyee & Barat, Parthasarathi & Thakur, Ashoke & Mohan Gantayet, Lalit & Mukherjee, Indranil & Ray Chaudhuri, Shaon. (2017). Simultaneous sequestration of nitrate and phosphate from waste water using a tailor made bacterial consortium in biofilm bioreactor. Journal of Chemical Technology and Biotechnology. . 10.1002/jctb.5487.

2. Saha A, Santra SC (2011). Isolation and characterization of solid waste decomposing bacteria – a screening trial, Sustainable Waste Management, pp. 534-541. ISBN: 81-86862- 41 – 2

3. Saha A, Santra SC (2014). Isolation and Characterization of Bacteria Isolated from Municipal Solid Waste for Production of Industrial Enzymes and Waste Degradation. J MicrobiolExp 1(1): 00003.

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4. Ghoshal T, Ghosh S, Saha A, Haldar N, Thakur AR, Ray Chaudhuri S (2014). Combination of conventional and in-silico approach for identifying an industrially important isolate of *Aeromonas*. OnLine J. Biol. Sci., 14: 70-83.

5. Ghosh M, Saha A, Jangid K, Joshi A A, Ray Chaudhuri S. 2016. A polyphasic approach of species identification for genus *Bacillus*. *Life Science: Recent Innovations & Research*. International Research Publication House. Pp. 227-256 ISBN: 978-93-84443-53-5

6. Ghosh S, Ghosh S, Saha A, Thakur AR, Datta D, Mukherjee I, Ray Chaudhuri S. 2016. *Photobacterium leiognathi* CMB_001: New -generation oxygen detection biosensor for environmental quality monitoring. *Life Science: Recent Innovations & Research*. International Research Publication House. Pp. 273-286 ISBN: 978-93-84443-53-5

7. Ray Chaudhuri S, Sharmin J, Banerjee S, Jayakrishnan U, Saha A, Mishra M, Ghosh M, Mukherjee I, Banerjee A, Jangid K, Sudarshan M, Chakraborty A, Nath R, Banerjee M, Singh SS, Saha AK, Thakur AR . 2016. Novel Microbial System Developed from Low-Level Radioactive Waste Treatment Plant for Environmental Sustenance. Accepted.

OTHER PERSONAL INFORMATION

Date Of Birth	:	29.05.1982
Nationality	:	Indian
Sex	:	Female
Marital Status		Married
Family		Husband & Daughter (DoB – 30.06.2014)
Languages Known	:	English, Bengali, Hindi (Able to speak, read and write).
Hobbies	:	Photography, Singing, Reading story books, Gardening, Working for more clean and green environment
Passport No	:	G2346679

REFERENCES

1. **Prof S.C.Santra**
   Head of the Department
   University of Kalyani

2. **Dr. Shaon Ray Chaudhuri**
   Lecturer : Department of Biotechnology
   WestBengalUniversity of Technology

3. **Prof. Rintu Banerjee**
   Agricultural and Food Engineering Department.
   IIT Kharagpur.

DECLARATION

I here by declare that all the information furnished above is true to the best of my knowledge and belief. I bear the responsibility for the correctness of the above mentioned particulars.

Date: April 19, 2019, 2018

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AMRITA SAHA

Place: Salt Lake, Kolkata