

CURRICULUM VITAE–ANINDITA SEAL (Ph.D.)

Assistant Professor

Department of Biotechnology & B. C Guha Centre for Genetic
Engineering and Biotechnology
35, Ballygunge Circular road, Kolkata-19

✧ PERSONAL DETAILS

Date of Birth: 5th June 1972

Place of Birth: Calcutta, INDIA

Nationality: Indian

✧ PROFESSIONAL/RESEARCH EXPERIENCE

31st October-2008- Present

Department of Biotechnology, B. C Guha Centre for Genetic engineering and Biotechnology

Lecturer: 31.10.2008–03.08.2009

Senior Lecturer

(Assistant Professor Stage II): 03.08.2009–03.08.2014

Assistant Professor Stage III: 03.08.2014– till now

3rd August 2005- 31st Oct 2008

Department Biotechnology, West Bengal University of Technology

Lecturer: 03.08.2005–31.10.2008

Feb 2002-Jun 2004

Max Planck Institute for Plant Breeding Research, Cologne, Germany – Post Doctorate Fellow in the
Department of Plant Microbe Interaction

Post Doctoral Fellow

August 1997 to March 2002

Calcutta University (CU), Dept. of Biochemistry – PhD

✧ CONFERENCES ATTENDED

International

International Conference on Microbiome Research 2018 held between 19th-22nd Nov 2018 Pune

Oral Presentations

- Oral presentation in the 14th international Symposium on Metal Ions in Biology and Medicine & 4th Green Health Conference (2016) held in Mumbai University entitled ‘An Endophytic Bacterial Consortium Improves Arsenic Phytoremediation Efficacy of an Arsenic Accumulator *Solanum nigrum*’.
- Speaker in the international Bose institute symposium “A Journey from Plant Physiology to Plant Biology” 2008, for the presentation entitled High-throughput cloning and characterization of novel heavy metal transporter ESTs from *Brassica juncea*-a metal tolerant and accumulator plant

Poster presentations

- Poster entitled ‘Natural Resistance Associated Macrophage Protein from *Brassica juncea* exhibits a novel interaction with a membrane bound thioredoxin protein’. Ananya Marik, Haraprasad Naiya, Gairik Mukherjee, Madhumanti Das, Soumalee Basu, Chinmay Saha & **Anindita Seal** presented at the 3rd International Plant Physiology Congress: Strategies and Challenges in Plant Biology Research IPPCongress(2015) held in Delhi
- Poster entitled ‘*Typha angustifolia* a wetland macrophyte hosts endophytes predominantly with nitrogen fixing properties’ Chinmay Saha, Prerana Agarwal and **Anindita Seal** presented in the international conference on “Plant Growth, Nutrition & Environment Interaction; and Plant Abiotic Stress Tolerance II” (2012) held in Vienna
- Poster entitled ‘Investigating the molecular mechanism of heavy metal tolerance in *Typha angustifolia*- a natural inhabitant of Uranium tailings’ Debjani Chakraborty, Sanjukta Abhay Kumar Monali Sen & **Anindita Seal** presented in the international conference on Plant Biology FESPB 2008 held in Tampere, Finland
- Stress-mediated activation of two tobacco Calcium-Dependent Protein Kinases –Role of protein phosphorylation in enzyme regulation Claus-Peter Witte, **Anindita Seal**, Janine Gielbert and Tina Romeis. Poster presented at the 7th International Congress of Plant Molecular Biology, ISPMB (2003) held in Barcelona, Spain

National

Oral Presentations

- Invited speaker in the Probing Biology: in vivo, in vitro & in silico VIII UGC CAS funded One Day National Seminar on 25th February, 2020 at Department of Biophysics and Molecular Biology
- Invited speaker in the University of Engineering & Management Department of Biotechnology 27th February 2020
- Invitation to deliver the ‘plenary lecture’ in the National Seminar on “Recent Advances in Translational Research” on 29th February, 2020.
- Invited speaker in Molecular Intricacies of Plant-Associated Microorganisms (MIPAM-2019) held in NIPGR, Delhi 1-3 Feb 2019 on “A Three Partner Yeast-Bacteria-Plant interaction in Improving Nitrogen Nutrition in Rice”
- Invited speaker in the National conference Bioengineering 2018 held in Department of Biotechnology and Medical Engineering, National Institute of Technology, Rourkela held between Dec 14-15 2018 on “An Arsenic tolerant endophytic microbial consortium from *Lantana Camara* increases As-phytoremediation in an As-accumulator Surrogate Host *Solanum nigrum*”
- Invited Speaker at the 3rd School on Trace Analysis held in Mizoram University, Aizawl (2017)
- Invited as Mentor in the DST Inspire Internship science camp held in Ramkrishna Ashram, Nimpith (2016)
- Invited Speaker in Lady Brabourne College on Endophytes-probiotics for plant (2016)
- Guest Speaker in our One-Day Lecture session to be organized by the Department of Microbiology for the undergraduate students in T.H K Jain College (2015)

- Invited speaker on Food Security & GM Crop in Celebration of National Science Day organized by West Bengal Council of Science and Technology (2013)
- Speaker in the SBC Calcutta Chapter entitled “Isolation and expression analysis of heavy metal transporters from *Brassica juncea* by coupling high throughput cloning with a molecular fingerprinting technique” held in Department of Biochemistry, Calcutta University (2010).

✧ **GRANTS AND PROJECTS**

Completed projects:

1. Principal investigator of a project funded by Board of Research in Nuclear Sciences entitled ‘Molecular investigation of heavy metal tolerance/hyperaccumulation in plants growing on the Uranium tailing ponds in Jaduguda’ sanction no2005/36/30/BRNS**2006-2010**
2. Principal investigator of a project funded by Council of Scientific and Industrial Research (CSIR) Government of India entitled ‘Investigating the molecular basis of heavy metal tolerance in *Brassica juncea* (Indian Mustard) using yeast as a functional model’ sanction no 38(1120)/06/EMR-II**2006-2010**
3. “Isolation of interacting partner for *Brassica juncea* NRAMP metal transporters: on a Yeast Two-Hybrid platform”- All India Council of Technical Education (AICTE) **2008-2010**
4. “Using mutation and domain swap to investigate function of two metallothionein genes from the *Typha angustifolia* in heavy metal tolerance, detoxification and ROS scavenging” No. 56-BT (Estt.)/RD-28/09 West Bengal State DBT **2010-2014**
5. Investigation of the Role of Three Yellow Stripe Genes in the Cadmium and Lead Accumulation in *Brassica juncea* 38(1276)/11/EMR-II CSIR **2011-2014**
6. Functional Characterization and Validation of Protein Interactors of BjNRAMP4.1 obtained in Split-Ubiquitin Yeast Two-Hybrid Screen. SR/So/PS/0019/2012 **2012-2015**
7. Endophytic microbes-mediated growth promotion mechanisms in an Arsenic accumulator terrestrial plant and a heavy metal accumulator aquatic macrophyte *Typha angustifolia*. BT/PR15410/BCE/08/861/2011 **2012-2016**

Running Projects:

8. UGC-UPE grant, University of Calcutta for beneficial plant-microbe interaction **2017**
9. West Bengal DBT project entitled Exploring the molecular mechanisms leading to improvement of Endophyte-mediated Arsenic phytoremediation in *Solanum nigrum* no 70(Sanc.)-Bt/(Estt.)/RD-61/2017
10. “Investigating the role of endobacteria harboured within plant endophyte *Rhodotorula mucilaginosa* JGTA-S1 in a tripartite interaction that improves nitrogen nutrition in rice” (CRG/2019/000378) dated 16th March 2020

✧ PUBLICATIONS

- A tripartite interaction among the basidiomycete *Rhodotorula mucilaginosa*, N₂-fixing endobacteria, and rice improves nitrogen nutrition in plants Paul K \ddot{Y} , Saha.C, \ddot{Y} , Nag M, Mandal D, Naiya H, Sen D, Mitra S, Kumar M, Bose D, Mukherjee G, Naskar N, Lahiri S, Das Ghosh U, Tripathi S, Poddar Sarkar M, Banerjee M, Kleinert A, Valentine A.J, Tripathy S, Sinharoy S, and Seal A The Plant Cell (\ddot{Y} Co- First Author) Vol. 32: 486–507, February 2020 (**I. F:9.614**)
- “A Protocol for functional study of genes in Brassica juncea by Agrobacterium-mediated transient expression– applicability in other Brassicaceae”, Journal of Plant Biochemistry and Biotechnology accepted (2019) Das, M \ddot{Y} , Naiya, H \ddot{Y} , Marik, A, Mukherjee, G and Seal A (\ddot{Y} Co- First Author) (**I. F:1.038**)
- A unique life-strategy of an endophytic yeast *Rhodotorula mucilaginosa* JGTA-S1—a comparative genomics viewpoint Diya Sen[†], Karnelia Paul[†], Chinmay Saha, Gairik Mukherjee, Mayurakshi Nag, Samrat Ghosh, Abhisek Das, Anindita Seal \ddot{Y} , and Sucheta Tripathy \ddot{Y} \ddot{Y} **Corresponding author** DNA Research, Volume 26, Issue 2, April 2019, Pages 131–146, <https://doi.org/10.1093/dnares/dsy044> **I. F. 4.009**
- An Endophytic Bacterial Consortium modulates multiple strategies to improve Arsenic Phytoremediation Efficacy in *Solanum nigrum* (2018) Mukherjee, G., Saha, C., Naskar, N., Mukherjee A., Lahiri, S., Majumder, A.L., **Seal A**, Scientific Reports (2018) 8:6979 doi no 10.1038/s41598-018-25306-x **I. F. 4.122**
- Comparative profiling of the rhizospheric soil of *Typha angustifolia* L from heavy metal contaminated and free sites reveals the selective abundance of γ -Proteobacteria and β -Proteobacteria Upal Das Ghosh, Pankaj K Singh, Sayak Ganguli, Chinmay Saha , Ayan Chandra, **Anindita Seal**, Mahashweta Mitra Ghosh Indian Journal of Experimental Biology Accepted
- Split-ubiquitin yeast two-hybrid interaction reveals a novel interaction between a natural resistance-associated macrophage protein and a membrane bound thioredoxin in *Brassica juncea*. Ananya Marik, Haraprasad Naiya, Madhumanti Das, Gairik Mukherjee, Soumalee Basu, Chinmay Saha, Rajdeep Chowdhury, Kankan Bhattacharyya, **Anindita Seal**. Plant Mol Biol. 2016 92 (4-5), 519-537 **I. F. 3.543**
- A consortium of non-rhizobial endophytic microbes from *Typha angustifolia* functions as probiotics in rice and improves nitrogen metabolism. Chinmay Saha, Gairik Mukherjee, Prerana Agarwal Banka, **Anindita Seal** Plant Biol (Stuttg). 2016 18 (6), 938-946 **I. F. 2.156**
- Early changes in shoot transcriptome of rice in response to *Rhodotorula mucilaginosa* JGTA-S1. Chinmay Saha, **Anindita Seal** Genom Data. 2015 Oct 24;6:237-40. doi: 10.1016/j.gdata.2015.09.023 Normalized Impact per Paper (SNIP): **0.345**
- Root-associated iron oxidizing bacteria increase phosphate nutrition and influence root to shoot partitioning of iron in tolerant plant *Typha angustifolia* Upal Das Ghosh, Chinmay Saha, Moumita Maiti, Susanta Lahiri, Sarbari Ghosh, **Anindita Seal** & Mahashweta Mitra Ghosh Plant & Soil (2014) DOI 10.1007/s11104-014-2085-x Corresponding Author **I. F 3.306**

- Manganese and iron both influence the shoot transcriptome of *Typha angustifolia* despite distinct preference towards manganese accumulation Debjani Chakraborty, S. Abhay Kumar, M.Sen, S. K. Apte, S. Das, R. Acharya, T. Das, A. V. R. Reddy, S. Roychaudhury, H. Rajaram, **Anindita Seal** Plant & Soil (2011) 342:301–317 **I. F 3.306**
- Isolation and expression analysis of partial sequences of heavy metal transporters from *Brassica juncea* by coupling high throughput cloning with a molecular fingerprinting technique; Soumita Das; Monali Sen; Debjani Chakraborty; Manidipa Banerjee; **Anindita Seal** Planta(2011) 234:139–156 **I. F 3.249**
- Tobacco calcium-dependent protein kinases are differentially phosphorylated in vivo as part of a kinase cascade that regulates stress response Claus-Peter Witte, Nana Keinath, Ullrich Dubiella, Raphael Demouliere, **Anindita Seal**, Tina Romeis J Biol Chem. 2010 Mar 26;285(13):9740-8 **I. F 4.010**
- Protein turnover in response to transient exposure to exogenous auxin is necessary for restoring auxin autotrophy in a stressed *Arachis hypogea* cell culture Plant Cell, Tissue & Organ Culture (2006) Ronita Nag, Manas Kanti Maity, **Anindita Seal**, Amit Hazra, Maitrayee DasGupta **I. F 2.004**
- Exogenous auxin depletion renders an *Arachis hypogea* suspension culture sensitive to water loss without affecting cell growth. **Anindita Seal**; Amit Hazra; Ronita Nag; SubhoChaudhuri and Maitrayee DasGupta. Plant Cell Reports (2001) Vol 20 pg 567-573. **I. F 2,989**
- Autophosphorylation Dependent Activation of a Calcium-Dependent Protein Kinase from *Arachis hypogaea* Plant. Subho Chaudhuri, **Anindita Seal**, and Maitrayee DasGupta. Plant Physiology (1999) Vol 120 pg 859-866 **I. F 5.949 (2017)**

◇ **TEACHING/MENTORING**

Duration Oct 2008-till date

Department of Biotechnology and B. C Guha Centre for Genetic Engineering and Department of Biotechnology

Assistant Professor in Department of Biotechnology & B. C Guha Centre for Genetic Engineering and Biotechnology (www.gcgeb@caluniv.in).

Subjects taught: Genetics, Plant Biotechnology, Recombinant DNA Technology and Genomics to the M. Sc students of Biotechnology, Microbiology, and Neuroscience

Duration: November 2004 to 2008 Oct

West Bengal University of Technology (WBUT), Dept. of Biotechnology

Subjects taught: Genetics, Plant Biotechnology, and Molecular Biology to students of M. Tech in Biotechnology, Integrated Ph.D. in Molecular Biology and Integrated Ph.D. in Microbiology students

- **Teaching Ideology and Innovations:**

I introduced open book test while teaching in WBUT to check the analytical ability of students. I have introduced self-teaching by students where students have to give lectures to their peers while I guide them as for how to deliver a lecture.

- ***Mentoring plan***

No of students who have completed Ph.D.	4
No of students who have submitted Ph.D.	2
No of student mentoring presently	4

Regularly train students from different students from different Universities and Colleges under their curriculum and students sent under Indian Academy of Sciences

❖ **AWARDS**

- Qualified National Eligibility Test (NET) 1997
- Qualified Graduate Aptitude Test in Engineering (GATE) with a percentile of 97.92 and all India rank of 58
- Ranked third in the Masters of Science examination in Biochemistry (Calcutta University) in the class of 1996.
- Travel grant availed from Department of Biotechnology, CICS India, and the University of Calcutta for attending Plant Growth, Nutrition & Environment Interaction; and Plant Abiotic Stress Tolerance II” (2012) held in Vienna in 2012
- Travel grant availed from AICTE, and the West Bengal University of Technology for attending FESPB conference held in Finland 2008

❖ **OTHER EXAMINATION AND EVALUATION DUTIES**

- Worked as moderator and examiner for several courses in Department of Microbiology and Biotechnology in St Xavier’s College, Kolkata
- Question setter in Lady Brabourne College Kolkata
- Takes classes, evaluates examination papers and conducts examination in other departments of Calcutta University like Department of Microbiology, Neuroscience, and Biochemistry, Calcutta University
- Head examiner of B. Sc Microbiology PART II MCBA Paper III Grp B
- Moderator of CU B. Sc papers

❖ **MEMBER OF SOCIETIES**

- Life Member of Society of Biological Chemists, India
- Life Member of Indian Science Congress, India

❖ **CONSULTANCY (Honorory) outside University hours**

- Remedy Life Care