

# Amlan Chakraborty

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## Objective

Seeking an opportunity for pursuing PhD to capitalize on both my professional and educational experience allowing me to progress in my career. Emphasis on constant research and development in the area of my interest has been a long term ambition of mine. This however will be a new endeavour for me which I believe that with constant efforts, motivation and hard work would be able to do wonders for my personal welfare, colleagues and above all, the organization itself.

## Personal Details

Date of Birth : 8<sup>th</sup> August 1991  
 Father's Name : Mr. Gautam Chakraborty  
 Mother's Name : Mrs. Jayanti Chakraborty  
 Sex : Male  
 Marital Status : Unmarried  
 Languages Known : English, Hindi, Bengali, German(Limited Working Profeciency)  
 Nationality : Indian

## Educational Profile

S. No.	Name of Examination	Name of Institute	Board/University	Year	Percentage / CGPA
1	<b>B.Tech + M.Tech (Dual Degree) in Biotechnology</b>	Amity Institute of Biotechnology, Noida	Amity University Uttar Pradesh, Noida, UP	2010-15	8.95 CGPA
2	<b>Higher Secondary Examination- HSC (12th)</b>	St. Augustine's Day School, Kolkata	Council for the Indian School Certificate Examination (ISC)- Equivalent to Cambridge 'A' Level	2010	79.8%
3	<b>Senior Secondary Examination –SSC (10th)</b>	St. Augustine's Day School, Kolkata	Indian Certificate of Secondary Education (ICSE)	2008	90.4%

## Technical Skills

- Imaging in Scanning Electron Microscope
- Biophysics and Structural Biology.
- Biosensor and Biophotonics.
- Cell Signalling and Systems Biology
- Microarray Technology
- Protein Engineering
- Molecular Modelling and Docking
- Designing chemical compounds *in-silico*
- NCI 60, HeLa, Fibroblast and Epithelial cell culture maintenance
- FPLC, HPLC, GC-MS
- Bioprocess Technology
- Recombinant DNA Technology
- RAPD, RFLP, SSR

## Experience and Training

### ➤ May, 2013-July, 2013, Allele Life Sciences Pvt. Ltd. Noida, UP

**Designation:** Research Associate

**Projects Assigned:**

- Worked on a Project entitled “Inhibition of Exotoxin A (NAD- dependent ADPRT) from *Pseudomonas aeruginosa* using Zingibane”.
- Worked on the Project entitled “Docking of MNPG, CapGal, ONPG, GM1os inhibitors against CTX cholera toxin to estimate the best inhibition”.

**Credits:** Guided 2 projects entitled

- Isolation and screening of cellulolytic bacteria from soil and optimization of cellulase production and activity.
- Effect of pH, alcohols, aldehydes on plant, yeast, bacterial, fungal, Human blood DNA and RNA.

### ➤ May, 2012-July, 2012, Allele Life Sciences Pvt. Ltd. Noida, UP

**Designation:** Project Intern and Research Associate

**Assignment:**

- Worked on a Project entitled “Optimization of DNA, total RNA isolation and PCR-RFLP, PCR-SSR methods to find out the most suitable condition using MATLAB for Molecular analysis of *Plumbago rosea*”.
- Worked on the Project with Mr. Prashant Gadge on RAPD and worked personally on RFLP and SSR.

**Credits:** Guided students on RDT, Molecular Biology, DNA Fingerprinting and on Cloning and expression of Petatin gene of *Solanum tuberosum*.

### ➤ May, 2011-July, 2011 Allele Life Sciences Pvt. Ltd. Noida, UP

**Designation:** Project Intern

**Assignment:** Was assigned a project entitled “Cloning and expression of the partial EIN3 gene in *Magnifera indica* by expression vector pET22b”.

**Credits:** Had worked basically on enhancing the effects of restriction enzymes used in the experiments and did *Agrobacterium* mediated transformation.

## Patents

1. **Title:** BioElectricity, Waste remediation and increased Nitrogenase specific activity in plants by cloning and expression of nifF, nifJ gene in *Geobacter metallireducens*

**Date of Filing:** 10<sup>th</sup> January 2013

**Principal Inventors:** Amlan Chakraborty (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

Apoorv Gupta (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

Dr. Sitanshu Sekhar Lahiri (Professor Emeritus, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

**Patent Filing No:** INDIA 73/DEL/2013

**Abstract:** The present invention provides a recombinant/ transformed *G. metallireducens* bacterium and a method for production thereof which leads to generation of electricity from waste organic matter and metals. It also produces high content of nitrogenase for use by plants. In the present study, nifF gene from *Azotobacter vinelandii* DJ and nifJ gene from *Lactococcus lactis* subsp. *lactis* II1403 are cloned in the BamHI, EcoRI sites respectively of the pEA3 vector. After transformation in *G. metallireducens*, five out of six constructs are found to be stable. Screening of recombinant clones was done by in situ hybridisation using 32P-labelled nifF, nifJ DNA as the probe.

2. **Title:** A System and a method for label free detection of DNA hybridization

**Date of Filing:** 4<sup>th</sup> January 2013

**Principal Inventors:**

- Amlan Chakraborty (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)
- Abhijeet Dasgupta (M.Tech- Electronics and Communication, Amity School of Engineering and Technology, Amity University Uttar Pradesh, Noida)
- Dr. Sitanshu Sekhar Lahiri (Professor Emeritus, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

**Patent Filing No:** INDIA 38/DEL/2013

**Abstract:** The present invention relates to a fully electronic biosensor for label free detection of DNA hybridization comprising low fixed-pattern noise (LFPN) capacitive trans-impedance amplifier (CTIA) coupled with a CMOS transistor. The invention works on the principle of semiconductor CMOS operation under the application of voltage detection converted by using various signal converters from the signal generated due to hybridization. No ferrocene or on chip gold electrode is required. A replaceable cavity for the DNA and the probe is used for multiple usage, higher precision, noise reduction and increased efficiency.

3. **Title:** Natural preservatives obtained from plant *Cinnamomum tamala* to increase the shelf life of the dairy products.

**Date of Filing:** 12<sup>th</sup> December 2012

**Principal Inventors:**

- Amlan Chakraborty (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)
- Apoorv Gupta (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)
- Dr. Sitanshu Sekhar Lahiri (Professor Emeritus, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

**Patent Filing No:** INDIA 3864/DEL/2012

**Abstract:** The present invention relates to preservative of dairy products by adding natural preservatives prepared from extracts of plants of the Lauraceae family or mixtures thereof to the dairy products and the method of using the same. The preservatives obtained from the medicinal plants that have antimicrobial preservation effect on dairy products. The preservation also lengthens the shelf-life of dairy products by using naturally occurring substance obtained from the plant *Cinnamomum tamala*. The preservative is added to the dairy products in a determined amount that preserves the dairy products for a long time without any spoilage.

4. **Title:** A novel ambient stable DNA diagnostic kit for detection of microbial and genetic diseases.

**Date of Filing:** 4<sup>th</sup> October 2012

**Principal Inventors:**

- Amlan Chakraborty (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)
- Dr. Sitanshu Sekhar Lahiri (Professor Emeritus, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

**Patent Filing No:** INDIA 2977/DEL/2013

5. **Title:** A rapid, inexpensive and chemical method for testing of blood group and a kit for the same.

**Date of Filing:** 12<sup>th</sup> January 2012

**Principal Inventors:**

- Amlan Chakraborty (B.Tech + M.Tech Dual Degree- Biotechnology, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)
- Dr. Sitanshu Sekhar Lahiri (Professor Emeritus, Amity Institute of Biotechnology, Amity University Uttar Pradesh, Noida)

**Patent Filing No:** INDIA 276/DEL/2012

**Abstract:** The present invention relates the ABO system of Blood Grouping; the antigens which are surface glycoproteins are responsible for Blood Grouping. The 'A' group blood has a terminal n-acetyl galactosamine residue whereas the 'B' group blood has a terminal Fucose and Galactose residue. We commonly used Benedict's reagent which can detect the presence of Galactose giving a positive test for 'B' group blood. Sodium periodate or conc. Hydrochloric acid can form precipitate with n-acetyl galactosamine; giving a positive test for group 'A' blood. In case of 'AB' group, it has both type of

residues, thus it should give colour and precipitate with both the above reagents used together. On the other hand blood group 'O' do not give colour or precipitate since the terminal residues are absent.

## Publications

1. Amlan Chakraborty, and Alisha Mahajan, "Cellulase Activity Enhancement of Bacteria Isolated From Oil-Pump Soil Using Substrate and Medium Optimization." American Journal of Microbiological Research, vol. 2, no. 2 (2014): 52-56. doi: 10.12691/ajmr-2-2-1.

**Abstract:** Cellulase is composed of more than one distinctive enzymes which can degrade cellulose and is produced by a wide variety of fungal and bacterial species and the enzyme is transported across the cell membrane to the outside environment. The product of cellulose degradation is known to form glucose and important monomer highly used in food industry for producing various commercial products including alcohol. The problem lies in converting lipid rich cellulose source or cellulose from plants with a higher quantity of unsaturated fatty acids. This problem has created a need of finding bacteria capable of cellulose digestion without the inhibitory effects of lipids and poly-unsaturated fatty acids. To solve this problem, bacterial specie was isolated from a soil rich in oil, since it was collected from a petrol pump with little trace of vegetative cover. Also, due to lack of oxygen there was a chance of acclimatization of the bacteria and developing itself as an anaerobe. The cellulomonas medium was optimized by using different amino acids, Carbon sources, and Nitrogen sources. Extracted crude cellulase was subjected to change in pH, incubation temperature and metal ion supplementation and was inferred that Cysteine proved to be the best amino acid supplement followed by maltose being a good carbon supplement and ammonium chloride for nitrogen. At 60 °C and pH 7.15 the crude cellulase yielded higher glucose. Also a supplementation of Cobalt and Manganese enhanced the cellulase production enlightening the way that it may be used in traces for any metabolic pathway feeding the cellulase production. The colonies producing the crude cellulase had been tested on Whatman No.1 filter paper and have been found to grow colonized utilizing the filter paper as substrate. This infers the ability of the bacterium to produce cellulase and decay cellulose even at stressful conditions. The enhanced cellulase has negligible effect of poly-unsaturated fatty acids and capable of cellulose digestion from a diverse source.

2. **Amlan Chakraborty**, Pranav Patni; A Review on Microfabricated Engineered Particle Systems for Drug Delivery- PRINT; International Journal of Advanced Information Science and Technology (IJAIST) ISSN: 2319:2682 Vol.21, No.21, January 2014 pp 47-51.

**Abstract:** The unique characteristics of perfluoropolyether (PFPE) to fabricate monodisperse, shape and size specific particles ranging from a nanometer to micrometer size regime is utilized by Particle Replication in Non-wetting Templates (PRINT). Precisely engineered particles are produced by lithographic techniques derived from the microelectronics industry that has the nano-scale precision and spatial resolution thereby working as a platform for drug delivery. Here we describe the strategy for formulation, a 'Top-down' approach and delivery of small molecules not restricted to biological therapeutics using the PRINT technology; where particle size, shape and chemistry has been involved in a great extent in enhancing the systemic particle distribution properties and independent control of

surfaces functionality. Further, the particular interest due to pharmaceutical needs for increased control over dry powder drug delivery and high therapeutic indices towards respiratory drug delivery has an important application of PRINT technology. Construction of liposomes, dendrimers and colloidal precipitates at nano-scale has advantages when we speak of engineered nature of particle production. The edge of PRINT technology lies in its cargo carrying capacity including small organic therapeutics, biomolecules, macro-molecules; allowing a nano scale range facile incorporation of water soluble drugs.

3. J K Chandan, S Rachna, A S Gursatya, **C Amlan**, B Sumeet, and Dr. G.S. Khatri; ANALYSIS OF ENVIRONMENTAL EFFECT UPON GENETIC DIVERSITY ON SITOPHILUS GRANARIUS THROUGH RAPD; WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES; 2013 Volume 2, Issue 6, 5143-5147.

**Abstract:** Granary weevil (*Sitophilus granarius* L.) is the main pest of wheat which destroys the quality and quantity of wheat, due to which huge economical loss occurs. The aim of this study was to check the molecular diversity of granary weevils through RAPD. In this experiment, the environmental effect upon its molecular diversity of *Sitophilus granarius* collected from different regions of India was examined. For PCR-RAPD amplification, 10 decamer primers were used for screening, out of which one primer produced amplicons. After the analysis of RAPD results by Jaccard's similarity coefficient through Gel Quest, 75-91% similarity was found, between all the samples collected from different regions of India.

4. **Chakraborty Amlan**, Dasgupta Abhijeet; Effect of Low Power mm wave Irradiation on sedimentation, coagulation and light absorbance of purified Bovine Serum Albumin; Helix: ISSN 2277-3495; Vol. 3: 165-168; July, 2012.

**Abstract:** Globular protein Bovine Serum Albumin is water soluble and is sensitive to Low Power mm Wave (Micro wave) irradiation leading to Coagulation at the isoelectric Point. The objective of the work was to study the effect of these radiations on the coagulation and light absorbance of purified bovine serum albumin protein. When a heat stress is induced by a Low Power mm Wave, an aggregation of the molecules leading to coagulation occurs; comparatively at high temperature coefficient. The Bovine Serum Albumin Solution maintained at a pH of 3.5 after irradiation by Low Power mm Wave remained clear, the sedimentation constant was multiples almost 8 times (indicating aggregation and agglutination) when compared to the native sample. When the Bovine Serum Albumin sample was irradiated with a frequency of 72.13 GHz. a small change in sedimentation coefficient took place indicating primary coagulation.

When the frequency was increased to 98.52 GHz. there was a rapid increase in the sedimentation coefficient and high level of coagulation indicating almost complete denaturation of Bovine Serum Albumin. As a matter of fact frequency at 114.35 GHz. did not make much change in the sedimentation coefficient and coagulation remained almost constant. Similarly Bovine Serum Albumin treated at 56 °C for 25 minutes showed equivalent coagulation as compared to Low Power mm wave irradiation within the range of 72.13 GHz. to 114.35 GHz. as analysed by U.V/Vis. Spectroscopy (samples treated with Coomassie Brilliant Blue G250) at 595 nm showed relatively similar absorbance.

## Projects



1. Inducing cell apoptosis, virus induced IFN- $\beta$  expression in DF-1 cell line and liposome mediated delivery of phytochemicals for cell targeting and apoptosis.
2. Natural versus synthetic inhibition of the PI3K pathway causing over-expression and reduced apoptosis to HER2 leading to ER+/HER2+ breast cancer.
3. Targeting cell surface protein marker using Fe<sup>2+</sup> capped nanoparticle using magnetotacticity.
4. Comparative study of cellulase production by *Cellulomonas* sp. from various sites and optimization of substrates.
5. Inhibition of Exotoxin A (NAD- dependent ADPRT) from *Pseudomonas aeruginosa* using zingibane.
6. Docking of MNPG, CapGal, ONPG, Gm1os inhibitors against CTX cholera toxin to estimate the best inhibition.
7. Effect of oxidative phytochemicals on nicotine stressed DF1/UMNSAH ATCC CRL-12203.
8. Antibiotic Screening for IMP, VIM, OXA, KPC type Carbapenemases
9. Microfabricated Engineered particles for Drug Delivery (PRINT).
10. Nanoparticles based drug-delivery system for Cystic fibrosis
11. A novel, ambient stable dye for staining cellular proteins of DF1/UMNSAH cell line.
12. Optimization of culture conditions of *Bacillus subtilis* and production, partial purification and immobilization of  $\alpha$ - amylase.
13. Molecular analysis of *Plumbago rosea* and *Amorbus rubiginosus* using MATLAB where the following work had been undergone:
  - Optimization of DNA isolation for RFLP, SSR
  - Optimization of total RNA isolation
  - Optimized method for mtDNA , ctDNA isolation
  - Optimized method for protein extraction
14. Cloning and expression of petatin gene in *Solanum tuberosum* using expression vector pUC322
15. Emachanol- an eco-friendly biofuel
16. Cloning and expression of the partial EIN3 gene in *Magnifera indica* by expression vector pET22b.

## Software Skills

<b>Programming</b>	C, C++, Java, Bio-PERL
<b>Molecule Designing</b>	ChemBio Draw Ultra 12.0, ChemBio 3D Ultra 12.0
<b>Molecular Docking</b>	Hex Cuda, AutoDock 4.2
<b>Drug Screening</b>	PyRx Virtual Screening Tool
<b>Protein Designing</b>	BioDesigner
<b>Modelling and Simulation, Metabolic pathway reconstruction</b>	COBRA and CNA toolbox MATLAB, Cell Designer 4.2
<b>Miscellaneous</b>	Bioinformatics Tools, Adobe Photoshop, Corell Draw, Macromedia Flash

## Professional Affiliations

- Member of NGO (Jyoti Social Foundation, New Delhi).
- Member of International Association of Engineers (IAENG)
- Member of Association of Biotechnology Led Enterprises, Dept. of Biotechnology, Govt. of

India(ABLE)

- Member of British Science Association
- Member of IACSIT Bioinformatics and Biomedical Engineering Society (BBES)
- Member of IACSIT Applied Chemical Engineering Society (ACES)
- Member of IACSIT Reproductive Biology and Genetics Society (RBGS)
- Member of i-Xplore International Research Journal Consortium

## Scholastic Achievements and Awards

- **Graduate Aptitude Test in Engineering (GATE 2014) qualified with All India Rank 70.**
- Appreciated for Street Play on “Women Empowerment and Child Welfare” by NGO (Jyoti Social Foundation).
- Abstract entitled: “Natural versus synthetic inhibition of the PI3K pathway causing over-expression and reduced apoptosis to HER2 leading to ER+/HER2+ breast cancer”, Published in Proceedings of International Symposium on “Frontiers in Cancer Research : Prevention to Therapeutics”, 2013.
- Selected in the Top 20 teams for BEST 2013, organised by Dept. of Biotechnology, Govt of India in Association of Biotechnology Led Enterprises (ABLE).
- Selected for Interview in Kishore Vaigyanik Protsahan Yojana Fellowship by Department of Science and Technology, Government of India.
- Secured first position in Dramatics in Manzer 2013 (Jamia Hamdard Annual Cultural Festival), Amity Law School, Noida Cultural Fest, second position in Spring Fest 2014 (IIT Kharagpur cultural Fest), Momentum 2013 (ITM Gurgaon Cultural Fest) and third position in Pulse 2013 by All India Institute of Medical Science.
- Merit Scholarship from Amity University, Uttar Pradesh for 2011, 2012, 2013.
- GRE 2013 General Test score of 319.
- Secured 1st rank in Biotech Exhibition, 1st rank and Runners up (AYF, 2012) in All Rights Reserved (Technical Paper Presentation) and 2nd rank in Bioventura (Business Plan Presentation) at Incyte 2011, Amity Institute of Biotechnology, Technical Fest.
- Currently holding the post of Class Representative in College.
- Secured an All India Rank of 272 in National Level Science Talent Search Exam-2010 and 574 in 2008
- Secured Credit in Science and English in the IAIS Exam 2008 conducted by The University of New South Wales, Australia.
- Scored 1770 out of 2100 in Subject Test of Scholastic Aptitude Test(SAT, College Board, USA)
- Secured All India Rank of 972 at 8th National Science Olympiad conducted by LG.
- Secured ‘A’ Grade at Topic Writing Programme conducted by Global Environment Research Foundation.
- Secured 5th rank State Level in Science Talent Examination, 2004.
- Secured “A” Grade and “B” Grade in Science Aptitude and Talent Search Test, 2004 and 2005.
- Secured 3rd position in Debate conducted by All India Science Teachers Association for International Year of Physics, 2005.



- Passed Grade 2 with Distinction and Grade 4 with Merit Music Exam from Trinity College, London.
- Secured "A" Grade in Graphics Championship 2005.
- Secured 'B+' grade in Basic Rock Climbing Course 2006.
- Secured 2nd Position Swimming in National School Games Championship.
- Secured 'A' Grade in Graphics Championship 2005.
- Secured 1st position in PowerPoint Presentation conducted by Heinz Ketchup.

## Key Strengths

- Proactive and Adaptive in nature
- Understands the value of responsibility
- Excellent team-work spirit
- Dedicated towards my work

## Hobbies

- Cooking
- Acting
- Playing music in keyboard.
- Swimming
- Reading Science journals and Novels (Fictional, Adventure).

## Workshops

- "Indian Biotechnology Industry – Current Scenario" by- Mr. Anand Gupta, CEO, iLife Discoveries, Gurgaon and Dr. Pradeep Bharadwaj, CEO, Six Sigma Star Health Care Pvt. Ltd., Delhi.
- "Neural Mechanism of Rapid Eye Movement Sleep" by- Prof. Birendra Nath Mallick, Professor of Neurobiology, School of Life Sciences, Jawaharlal Nehru University, New Delhi.
- "Dual Purpose Recombinant Vaccine for Control of Fertility and Advance Stage Cancers Expressing hCG" by- Prof. G.P. Talwar, Director, Talwar Research Foundation, Delhi.
- "Interface Between Biological and Engineering Systems" by- Prof. Monendra Grover, Senior Scientist, National Bureau of Plant Genetic Resources, IARI, New Delhi.
- "Genome Analysis- from Human to Non-Human Systems: Implications and Applications" by- Dr. Sher Ali, National Institute of Immunology, New Delhi.
- "An Introduction to Anthropology" by- Prof. V.R. Rao and Prof. S.M. Patnaik, Department of Anthropology, North Campus, Delhi University, Delhi.
- "Bioprocessing Using RADE and NADE" by- Prof. S.N. Mukhopadhyay, Department of Biochemical Engineering and Biotechnology, Indian Institute of Technology(IIT), Delhi.

## References

1. Dr. Sitanshu Sekhar Lahiri (Professor Emeritus)  
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I hereby declare that the information furnished above is true to the best of my knowledge and belief.

**Amlan Chakraborty**

Place: **New Delhi, India**

Date: March 28, 2014