

ANINDYA SUNDAR DEY

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EDUCATION

Indian Institute of Technology, Kharagpur

Dual Degree (BTech + MTech) in Biotechnology and Biochemical Engineering

CGPA: 8.41/10

Kharagpur, India

July 2015 - July, 2020

Bethuadahari J.C.M.High School, Bethuadahari

West Bengal Council of Higher Secondary Education

Percentage: 91.4%

June, 2015

West Bengal Board of Secondary Education

Percentage: 93.0%

June, 2013

PUBLICATION

Dey AS, Bose H, Mohapatra B and Sar P (2020). Biodegradation of Unpretreated Low-Density Polyethylene (LDPE) by *Stenotrophomonas* sp. and *Achromobacter* sp., Isolated From Waste Dumpsite and Drilling Fluid. Front. Microbiol. 11:603210. doi: 10.3389/fmicb.2020.603210 (IF-4.235)

EXPERIENCE

Environmental Microbiology and Genomics Lab, IIT Kharagpur

Guide: Prof. Pinaki Sar

Summer Research Internship:

May, 2018-July, 2018

Title: Characterization of Microbial Communities from a Waste Dump-site and Exploring the Hydrocarbon Degrading Ability of These Microbes

- Primarily looked into the Hydrocarbon utilizing ability of bacteria isolated from waste dump site using differential plating technique and PCR by identifying the genes related to Hydrocarbon degradation
- Performed **DGGE** to differentiate plastic degrading bacteria from associated soil microbiome

Bachelor's and Masters' project:

July, 2018-June, 2020

Title: Evaluation of Low Density Polyethylene (LDPE) Biodegradation Potential of Natural Microbiome and Individual Strains

- Successfully enriched the LDPE utilizing bacteria from waste dump-site and drilling fluid samples
- Performed ATP estimation, protein estimation, lipase enzyme assay, phase contrast and fluorescence microscopy, substrate utilization test for characterization of LDPE biodegradation by the enriched bacteria
- Observed the changes on the surface of LDPE as a result of biodegradation using high end microscopy (**SEM and AFM**) and confirmed the **degradation of LDPE** by analyzing the resultant products by **GC** and **GC-MS** and determining the chemical modifications incorporated due to biotic treatment using **FTIR**
- Isolated and identified the microbial communities, *Stenotrophomonas* sp. and *Achromobacter* sp. responsible for LDPE degradation and used the isolated organisms for efficient LDPE biodegradation

National Center for Cell Science, Pune

Guide: Dr. Avinash Sharma

Summer Research Internship:

May, 2019-July, 2019

Title: Microorganisms Associated to Ethnic Fermented Food and Their Higher Potential to Probiotics

- Carried out sequencing of 16S rRNA gene of 133 samples using the **NGS on Illumina MiSeq** platform
- Analyzed 16S rRNA gene and ITS gene amplicon data using **QIIME and DADA2** pipelines
- Observed the microbial **community diversity** (Bacterial and Fungal) at different taxonomic level in ethnic fermented food and predicted their **probiotic potential** using **PICRUSt**

Recombinant DNA Technology Laboratory, IIT Kharagpur

Guide: Prof. A. K. Ghosh

Title: Extraction of Aflatoxin from *Aspergillus flavus*

December, 2017-January, 2018

- Isolated **aflatoxin** produced by *Aspergillus flavus* grown on PDA agar

- The toxin was ultimately used for the production of antibody against aflatoxin

COURSEWORK

Microbiology*	Introduction to Systems Biology	Gene Expression*
Environmental Biotechnology	Genetics	Bioinformatics*
Microbial Genomics and Metagenomics	Protein Engineering	Probability and Statistics
Biochemistry*	rDNA Technology*	Immunotechnology*
Cell and Molecular Biology*	Secondary Metabolites	Immunology
Bioprocess Technology*	Biochemical Reaction Engineering*	Partial Differential Equations
Programming & Data Structures*	Transgenic Technology	Downstream Processing

*indicates courses with laboratory component

SKILLS

Laboratory Related Skills:

- **Cell and Molecular Biology:** Microscopy, Confocal microscopy, Isolation and quantification of genomic DNA, plasmid and RNA, Preparation of competent cell, Transformation, Restriction Digestion, Ligation, Cloning, PCR, SDS PAGE and Agarose Gel Electrophoresis
- **Microbiology:** Bacterial cell culture techniques, Determination of MIC and antibiotic sensitivity of *E.coli*, Simple and Gram staining, Determination of cell size and number, Isolation of pure culture
- **Bioinformatics:** Protein structure homology modelling, Pairwise sequence alignment, Multiple Sequence alignment, Phylogenetic tree construction, Primer designing, BLAST
- **Analytical Biochemistry:** GC, HPLC, HPTLC, Rotary evaporator, Lyophiliser, Visible and UV Spectroscopy, Fluorescence and Atomic Absorption Spectroscopy, Centrifugation, Native PAGE
- **Biochemical Engineering:** Fermenter Operations, Cell growth Kinetics, Biohydrogen Production, Microbial Fuel Cell, Downstream processing of Biomass, Determination of thermal stability of enzyme
- **Biochemistry:** Qualitative and quantitative analysis of Protein and Amino Acids, Isolation and estimation of glycolipids and phospholipids, Study of enzyme actions and effects of different parameters
- **Enzyme Technology:** Different enzyme immobilization techniques, Determination of kinetic constants(K_m and V_{max}) of free and immobilized enzymes, Studying the performance of immobilized enzyme in a Continuous Stirred Tank Reactor and a Packed Bed Reactor

Technical Skills:

- **Software:** Microsoft Office (Excel, Word, Power Point), Solidworks, PyMOL, MEGA, Snapgene, PAST
- **Programming Language:** C, MATLAB, Python

ACHIEVEMENTS

- Qualified National Eligibility Test conducted by the Council of Scientific and Industrial Research (CSIR), India for the Award of Junior Research Fellowship, 2021
- Secured 392 rank in Graduate Aptitude Test in Engineering (GATE), India, 2019
- JEE MAINS and JEE ADVANCED: Ranked among top 4% (1,300,000 candidates appeared), 2015
- Finished in top 0.15% among WBCHSE Exam (among 1,000,000 candidates), 2015

EXTRA-CIRCULAR

National Service Scheme(NSS), IIT Kharagpur | Volunteer

July,2015-April,2017

Led the Teaching Team of my NSS Unit, Organized Medical Camp and Cleanliness Drives in Villages

Technology Dramatic Society(Druheen), IIT Kharagpur | Member

July, 2016-July, 2020

Participated in Inter-Hall Dramatics Competition (2016 and 2017)