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## Statement of Purpose

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I hail from a place which is considered to be an Arsenic hotspot in Bengal Basin (District Nadia, situated at the South part of Gangetic basic in West Bengal, India)<sup>1</sup>. In my childhood, I have seen some of my close relatives suffering from arsenic contamination in drinking water. I used to wonder if there is a way out for my people from this horrific grip of Arsenic pollution. As I grew up, I realized that I myself must try to seek for the answers. I felt that if I could help in mitigating the environmental issues, I could eventually make larger contribution to the human society. This has become an aim of my life, as I am writing this application to join as a doctoral research scholar at IIT Kharagpur – University of Manchester Joint PhD Program for the project titled “Microbial Cycling of Arsenic in Aquifers”.

I started to excel in academics from school as I always secured first rank in my class and finished among top 0.15% students in state board final exam in 2015. I have cleared one of the toughest exams in India, i.e. **Indian Institute of Technology (IIT)** entrance examination without having any formal coaching. I got admitted to the Department of Biotechnology at IIT Kharagpur, one of the most prestigious institutes for higher education in India. I was awarded Merit cum Means scholarship from my Institute to carry out my undergraduate studies. I found my subjects very interesting and it helped me in completing my Dual Degree course in Biotechnology and Biochemical Engineering with a **cumulative GPA of 8.41 out of 10**.

The diverse courses along with laboratory components offered at IIT Kharagpur and its rich research environment helped in fostering my thinking ability and learning the basics of any subject. I found my genuine interest in environmental application of microbiology and biotechnology. Having scored top grades in theoretical courses, to pursue my research interest, I joined the Environmental Microbiology and Genomics Laboratory, IIT Kharagpur. I worked on the **characterization of microbial communities from a waste dumpsite and looked for hydrocarbon utilizing microbes**. This helped me in acquiring basic microbiology laboratory skills. I gathered much confidence on research when I did my Bachelor’s and Master’s project as an independent project at this laboratory under the guidance of prof. Pinaki Sar. I used the enrichment culture technique to determine **Low Density Polyethylene (LDPE) degradation potential of microbes from natural sources** and confirmed the biodegradation using SEM, AFM, FTIR, GC, GC-MS, and other standard techniques. I isolated two species (identified as *Stenotrophomonas* sp. and *Achromobacter* sp.) from the enrichment and confirmed their individual capability to degrade LDPE. This not only gave me a proper experience with the sophisticated instruments and techniques but also showed me a glimpse of the exceptionally rich and diverse catabolic repertoire of microbial world. I received the best grade for my thesis entitled, **“Evaluation of Low Density Polyethylene (LDPE) Biodegradation Potential of Natural Microbiome and Individual Strains”**. My dedication and perseverance towards the project played critical role in publishing my research work in a peer-reviewed journal, *Frontiers in Microbiology*. I had an opportunity to work at National Center for Cell Science, Pune, India during the summer of 2019. Where I used the **Illumina Miseq platform for sequencing of 16S rDNA**

1. Mazumder DN, Ghosh A, Majumdar KK, Ghosh N, Saha C, Mazumder RN. Arsenic contamination of ground water and its health impact on population of district of nadia, west bengal, India. Indian J Community Med. 2010 Apr;35(2):331-8. doi: 10.4103/0970-0218.66897. PMID: 20922118; PMCID: PMC2940197.

**amplicon** and analyzed the data to find out the **microbial diversity present in ethnic fermented food and their probiotic potential**. I am also a part of a study on the **structure and function of rare taxa in arsenic-contaminated paddy-soil of West Bengal, India**. I have done sampling from various fields and been working on the data analysis.

In future, I envision myself as a bigger contributor to the environmental microbiology and biotechnology field, pursing research as a scientist or a professor. I feel that working on the extensive study on biogeochemistry of Arsenic cycling in the aquifers across West Bengal part of Bengal basin, as my doctoral study would lay great foundation of my career. The diverse scope of the program and working with renowned professors and other researchers of both the institutes would really enrich my knowledge. The microbiology and molecular biology laboratory skills as well as bioinformatic skills that I have acquired through my course works, research projects and internships for the past several years make me equipped to take up the graduate studies. I always try to bring out the best out of me in every circumstance. I firmly believe that all these qualities would help me to successfully complete my doctoral study at IIT Kharagpur and University of Manchester.

1. Mazumder DN, Ghosh A, Majumdar KK, Ghosh N, Saha C, Mazumder RN. Arsenic contamination of ground water and its health impact on population of district of nadia, west bengal, India. Indian J Community Med. 2010 Apr;35(2):331-8. doi: 10.4103/0970-0218.66897. PMID: 20922118; PMCID: PMC2940197.