SD Mines Visit, meetings and Participation in an international Conference

13 May 2024

I met **Program secretaries** – Alana and Kristein of Chemical and Biological Engineering and handed over JUIT souvenirs to them.

I also met **Dr. Tanvi Govil** – Assistant Professor – who showed interest in hiring our students as interns/scholars. I presented JUIT souvenirs to her as well. We discussed the current research proposals and Dr. Sani told us about current funding opportunities in research.

I met our Sirina Kalia – M.Sc. intern and asked about her project. She is learning and developing skills in Confocal microscopy, simulations and modelling related to her project.

At present **10 students of our JUIT are working in SD Mines**. 09 alumni (06 are in Ph.Ds, 03 in Masters), and 01 intern. I met 06 of them and inquired about their health, studies and funding. All are doing well and Jasmeet Kaur **(standing adjacent to Chirag in Snap)**- JUIT M.Sc. alumni recently got a Lawrence Mazlack fellowship award of $3000 for SD Mines. This is mainly because of support of Dr. Sani.

Lawrence Mazlack Fellowship for Jaypee University Biotechnology Student

Jasmeet Kaur, M.Sc. Biotechnology alumni from Jaypee University of Information Technology, Waknaghat was selected through Foreign Students' Exchange Program of JUIT and now working as Graduate Research Assistant in the Department of Chemistry, Biology, and Health Sciences, SD Mines, SD, USA. She is recently awarded with the prestigious Lawrence J. Mazlack Fellowship in USA. She is working with Prof. Rajesh Sani of SD Mines.

Prof. Sani added that The Lawrence J. Mazlack Fellowship, valued at $3,000, is a prestigious award offered to one deserving recipient within each PhD program. Recipients are chosen by their program heads, highlighting the recognition of academic excellence and research potential. This fellowship requires recipients to secure a matching full-time assistantship, reflecting a commitment to both academic pursuits and practical application in their field.

She is working on Synthesis and Characterization of Plant Growth Promoting Signaling Molecules under the NSF EPSCoR RII-T2 BioWRAP project, her research focuses on biomanufacturing and characterizing plant growth-promoting signaling molecules. By exploring these compounds as potential agricultural amendments, she aims to stimulate the proliferation of nitrogen-fixing microbiota in agricultural fields, thereby mitigating the reliance on synthetic nitrogen fertilizers.

Prof. Rajendra Kumar Sharma - Vice Chancellor JUIT and Prof. Sudhir Syal - Head Biotechnology and Bioinformatics department at JUIT congratulated Jasmeet on award of this fellowship.

I met Dr. Jingbo wang – Assistant Professor Physics an organizer of Sanford Underground Conference and thanked him for support and invitation. I also stopped by to say hello to dept. chair – Prof. Richard.

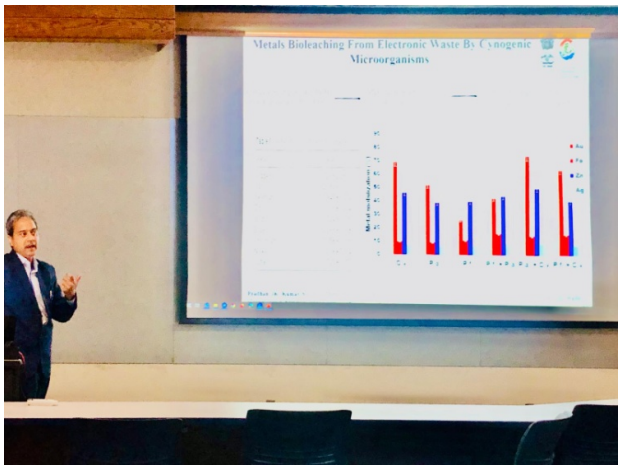
I presented JUIT souvenirs to Dr. Sani and expressed my gratitude for immense support all through these years.

14 May, 2024

Registration for Conference on Sanford Underground Research Facility

Here is the list of contributors Conference on Science at the Sanford Underground Research Facility (14-May 17, 2024): Contribution List · Indico (sanfordlab.org).

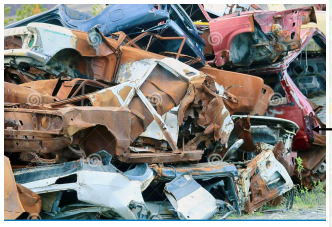
Dr. Sani and Dr. Tanvi were the Chair and Co-chair of Biology session. Dr. Sani's and Dr. Tanvi's students presented their work in this session as oral and poster presenters. My conference talk was also scheduled today on Biohydrometallurgy of e-waste – on the concept of urban mining. In this talk, I shared research efforts of my research group in this field. I also met Dr. Chris of Oklahoma University and we had nice discussion on methanotrophs and Biogas applications. Dr. Sani also shared important findings of methanotrophs with me.

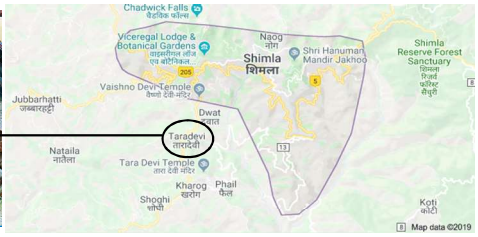


Biohydrometallurgy: A future of e-waste “urban mining”

Professor Sudhir Kumar
Department of Biotechnology and Bioinformatics
Jaypee University of Information

Augmentation in Bioleaching Potential of Potent Bacterial Isolates through Chemo-biohydrometallurgy Approach





01 New *Bacillus* sp. unveiled from metal contaminated soil and assessed for metal tolerance and bioleaching potential.

02 Enhancement of bioleaching efficiency by two-step bioleaching process and induced lixiviant production.

03 Chemo-biohydrometallurgy approach for efficient metal recovery.

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I was one of the judges for Biology related work in poster session of this SURF conference. The other judge was Dr. Steve Huges from Industry.

15 May, 2024

Community Project

Discussion proceeded on community project for waste management and generation of biofuels from it. Dr. Sani shared useful information and a project call on this project theme. It helped me to understand the current focus of funding agencies for community related projects in US.

4+1 Degree Program meeting

We had a meeting with Dr. Zhengtao – Head of the department of Chemical and Biological Science at SD Mines. We (Dr. Sani, Dr. Zhengtao , and myself) had a second round of discussion on 4+1 degree program between JUIT and SD mines. The first round of discussion was held in October, 2023. I specifically asked him about available financial support to JUIT students and nature of their visa. He explained about credit system of MS program of SD Mines. 06 to 12 will be research credits; 13-19 for electives, and 08 for core subjects. He assured to accelerate it to next level; though it might take some time to roll out this program. Dr. Sani's support towards past JUIT students was the genesis of this 4+1 degree program.

The JUIT souvenirs of JUIT were presented to Dr. Zhu and her secretary Ms. Amber. Dr. Zhengtao also extended us an opportunity to have lunch together. During lunch, Dr. Sani proposed that few US students need to visit JUIT for summer/semester exchange; this was seconded by me.

16 May

Interaction with Dr. Steve Hughes of Integrated Biorefining Corporation (Research Division of Cleanflex)

The concept of nano DNA, robotics in biotechnology industry, Preclinical plasmid and utilization of *Clostridium* for capturing CO_2, CO, H_2 for ethanol production was interesting.

After his lecture on industrial operation in the conference, we (Dr. Sani, Dr. Steve, and myself) had one hour interaction during lunch time and discussed about academics and industrial research.

In formal meeting with Dr. Sani's and Dr. Tanvi's research group, 10 students of the lab. presented their ongoing work in presence of Dr. Steve. Out of 10 students, 07 were alumni of JUIT.

1. Kely's (Ph.D. scholar) work was on EPS producing *Geobacillus* sp.
2. Antonia (UG student) was working on mitigating plastic pollution in agriculture through mulching film.
3. Ph.D. scholar Jasmeet Kaur explained her flavonoids work for eco friendly fertilizers.

4. MS student Chirag work was on PHA production by *Pseudomonas putida*.
5. Navdeep Kaur – Ph.D. scholar work was on synergistic microbial solutions for sustainable agriculture. Mike – a freshman also involved here and associated with Navdeep.
6. Kritia – Ph.D. scholar explained her present work on cell free synthesis of biopolymers
7. MS students – Ishita and Rimjhi's work was on Biomediated soil stabilization for enhanced infrastructure.
8. Sirina – An intern explained her research work on *Pseudomonas stutzeri* on biofilms.

I also shared about my university and research work of my group. Dr. Sani and Dr. Tanvi discussed about research interests of their group. Dr. Sani gave a Lab. tour to Dr. Steve and I also accompanied them. It was nice to see advanced lab. facilities including Nano IR, and molecular work stations, fermenters. I also visited Lab. no. 200 where I worked during my post doctoral studies.

Meeting with Adaland Suzi of International office – SD Mines

I along with Dr. Sani met Adaland Suzi. I thanked him for continuous support provided by her office to JUIT students for their internship, masters and Ph.D. program. I presented JUIT souvenir to her to Ms. Beth in absentia. Dr. Sani discussed the plan of sending SD Mines students to JUIT for a semester or short term training as a part of Students' Exchange Program. She said that suitable program will identified to see the possibility of sending students to JUIT.

17 May

Meeting with Prof. Chukwudi

Prof. Chukwadi is from Nigeria and working in Dr. Sani's group on availing his sabbatical leave. He is having interest in extremophilic micororganism and their applications. I asked about upcoming publications of his work.

Meeting with Sherwyn Braganza

He is a Ph.D. scholar working in Dr. Sani's lab and a computer graduate and now looking into Pan-genome analysis of extremophiles. We had a nice discussion linking the role of Computer applications in biofilm forming microorganisms.

Visit to Composite and Polymer Engineering (CAPE) Lab. and meeting with Dr. David Selem

Dr. Sani, Dr. Tanvi, myself visited CAPE lab. and met Dr. David Selem. We were accompanied by Wageesha Sharma, JUIT alumni and student of Dr. David (major advisor) and Dr. Sani (co-advisor). Wageesha is working on designing a new reactor with better mass transfer attributes. We also discussed about 4+1 program in brief. CAPE Lab. is a part of SD Mines located a mile away from main building.

Meeting with Dr. James Stone, Interim Provost and Head Dept. of Civil Engineering

Dr. Sani arranged my meeting with Dr. James Stone. I emphasized to begin students exchange program with civil department like we are doing with Chemical and Biological Engineering. I presented him JUIT souvenir, JUIT and civil engineering brochure with him. We discussed about existing mutual interest of students' exchange.

18 May 2024

We worked on for a potential research paper to be communicated in near future. It was on - A comparative analysis of biomethanation of primary and secondary wastes from cafeteria and corn processing industries – Bench-scale study and pilot-scale verification. Aditi David was the first author

Dipayan – who completed Ph.D. under Dr. Sani's mentorship helped me in outdoor work during my visit.

19-20 May 2024 – Visit to SDSU Brookings

Today, Dr. Sani helped me to see Dr. Gnimpieba of University of South Dakota who is Assistant Research Professor of Computer Science/Bioinformatics. He was also Graduate Program Director in the past for the Computer Science Program.

I shared details about our Bioinformatics program and our close association with the Computer science program. It was a very productive meeting. Dr. Tanvi - Assistant Professor - SD Mines was also present. We met in Shahi Indian Grill, Souix Falls.