Sudhir Kumar, Professor & Head - Department of Biotechnology and Bioinformatics

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Education

- Post Doc. – Department of Chemical and Biological Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota, USA
- Ph.D. – Thapar Institute of Engineering and Technology, Patiala, Punjab.
- M.Sc. (Hons) - Panjab University, Chandigarh
- B.Sc. (Hons) – Panjab University, Chandigarh

Research Interests

Our research work on electronic waste (E-waste) management involves impact assessment of E-waste in India and its safe handling and recovery of precious metals for industrial applications. We use acidophilic and cyanogenic microbial-leaching of metals from E-waste (Printed circuit boards – PCBs in our case). We also focus on elucidation of physiological role of microbial strains and the kinetics involved in the process of E-waste bioleaching. My research group also look for viable, decentralized solutions for utilization of lignocellulosic waste to biofuels like biogas and biohydrogen. Previously we also worked on bioremediation of hydrocarbon contaminated sites focusing on treatment methods like biostimulation and bioaugmentaion. Ultimate goal is to generate cost-effective sustainable environmental solutions.

Research Thesis Advisor (Ph.D. Students)

Past – 07

1. Dr. Mamta Kumari (2011)
2. Dr. Jatindra Kumar Pradhan (2013)
3. Dr. Guru Charan (2013)
4. Dr. Anil Kumar (2018)
5. Dr. Ritika Verma (2019)
6. Ankur Choudhary (2021)
7. Pooja Thakur (2024)

Current – 01

1. Ankita Bharti

M.Tech. Students

Past – 11

Sponsored Projects

Project	Funding Agency	Responsibility	Duration
Production and phyco-upgradation of biogas from pine straw co-digested with food waste	Directorate of Innovation and Development - DRID (Jaypee Research Fund)	PI	2023-2026
Pine needles based dark fermentation towards biohydrogen production	Directorate of Innovation and Development - DRID (Jaypee Research Fund)	PI	2023-2025
Pine needles' conversion to biofuels for rural empowerment	Directorate of Innovation and Development - DRID (Jaypee Research Fund)	PI	2022-2024
DBT Skill Development Program for science graduates	DBT	Coordinator	2019-2022
Biogas production for sustainable energy generation in Rural Himachal Pradesh using one-stage portable digester.	HP State Council for Science, Technology & Environment	PI	2016-2018
Elucidating the linkage between key limiting processes and microorganisms during anaerobic degradation of lignocellulosic waste	DST-RFBR sponsored Indo-Russia collaborative project	Co-PI	2014-2016
Bioremediation of electronic waste (E-waste) for precious metal recovery and	Department of Biotechnology	PI	2013-2016

removal of polybrominated diphenyl ethers (PBDE's)"	(DBT), Govt. of India		
Development of a bioleaching strategy for sustainable disposal and recycling of e-waste.	Ministry of Environment and Forests, Govt. of India	PI	2008-2011
Development of Technologies for Bioconversion of Lignocellulosic Waste from Herbal Industries for Developing Commercially Viable products	Ayurvet industry, Baddi, Solan, HP	PI	2007- 2010
Development of a Bioremedial system for diesel contaminated sites in south - western area of Himachal Pradesh.	Dept. of Science and Technology (DST), Govt. of India	PI	2004-2006

Patents: Granted – 03, Filed – 01

- A patent is granted on Metal extraction from e-waste. Inventors: Sudhir Kumar, Anil Kumar. Patent No. 456625, Granted on 04th October, 2023.
- A design patent is granted on Movable biogas reactor. Inventors: Karm Dass, Ankur Choudhary, Ashish Kumar, Sudhir Kumar. No. 319983-001.
- A patent is granted on Process of production of cellulose and pectinase from herbal industry residue jointly with Ayurvet Industry. Inventors: Sudhir Kumar, Mamta Kumari, RS Chauhan, K. Ravikanth (industry partner). Patent No. 304824, Granted on 21st December 2018.

Consultancy

- I along with my collaborator Prof. Ashish Kumar from Civil Engineering Department provide free consultancy to schools, colleges, universities and other institutions for establishing biogas plants (2009 onwards)
- Consultancy for Euroasia group in the year 2010. Eurasia Group is the world's leading global research and consulting firm; located in New York.

Technology Extension

- Biogas Digester fabrication (3000 litre digester and 2000 litre gas holder) Chitkara University, Baddi, Solan, HP. (year of establishment – 2022, sponsored by Chitkara University and fabricated by JUIT team)
- Biogas Digesters (03 in number) fabrications (1500 litre digester and 1000 litre gas holder for each) at 3BRD, Air Force Station, Chandigarh (year of establishment – 2020, sponsored by 3BRD, Chandigarh)

- Biogas Digesters (02 in number) fabrications (3000 litre digester and 2000 litre gas holder for each) at Jaypee Kanpur Fertilizers and Chemical Limited (KFCL). (year of establishment – 2019, jointly sponsored by JUIT, Waknaghat and KFCL, Kanpur)
- Biogas Digester fabrication (1500 litre digester and 1000 litre gas holder) at Govt. Girls Senior Secondary School, Solan, HP. (year of establishment – 2019, sponsored by school Funds and supported by JUIT, Waknaghat)
- Biogas Digester refabrication (3000 litre digester and 2000 litre gas holder) for workers' families JUIT, Solan (year of establishment – 2018, sponsored by JUIT, Waknaghat)
- Biogas Digester refabrication (3000 litre digester and 2000 litre gas holder) at Govt. Senior Secondary School, Burmana, Bilaspur (year of establishment – 2018, sponsored by JUIT, Waknaghat)
- Biogas Digester (1500 litre digester and 1000 litre gas holder) at Govt. Middle School, Gyancot, Sirmaur. (year of establishment – 2017, sponsored by HIMCOSTE, Shimla)
- Biogas Digester (1500 litre digester and 1000 litre gas holder) at Govt. Primary School, Dhar Ki Anji, Solan. (year of establishment – 2017, sponsored by HIMCOSTE, Shimla)
- Biogas Digester (1500 litre digester and 1000 litre gas holder) at Govt. Primary School, Pooghat-Bani, Solan (year of establishment – 2016, sponsored by HIMCOSTE, Shimla)
- On request of Eternal University, Baru Sahib of Distt.Sirmour (HP), I and Dr. Ashish Kumar fabricated a biogas plant (3000 litre digester and 2000 litre gas holder) and transferred the technology at their university campus, on 17th January 2015.
- On request of Burmana Panchyat of Bilaspur District, Himachal Pradesh under Nirmal Bharat Abhiyan, I and Dr. Ashish Kumar fabricated a biogas plant (3000 litre digester and 2000 litre gas holder) at Govt. Senior Secondary School, Burmana, Bilaspur on 26th December 2014.
- Biogas Digester (500 lire digester and 250 litre gas holder) at Govt. School, Baddi, HP. (year of establishment – 2010, sponsored by Rural ministry, HP Govt.)
- Installation of a biogas plant (3000 litre digester and 2000 litre gas holder) at Ayurvet Industry, Baddi, Solan, Himachal Pradesh (2010).

Publication

Full papers in Journals

- Kumar S, Charan G, Bharti V, Giri V. 2023. Heavy metal status and distribution in various soils and river sediment of cold desert high altitude microclimate. **Journal of the Indian Society of the Soil Science** 71 (4), 428-435

- Thakur P, Kumar, S. 2023. Exploring bioleaching potential of indigenous Bacillus sporothermodurans ISO1 for metals recovery from PCBs through sequential leaching process. **Waste Management and Research**. DOI: 0734242X231155102

- Mahajan R, Sharma G, Koundal S, Chadha P, Kumar S, Saini H.S. 2022. Co-metabolism of 4-bromophenol by Pseudomonas sp. EN-4 and toxicity evaluation of biotransformed samples. **Journal of Environmental Chemical Engineering**. 10(5). https://doi.org/10.1016/j.jece.2022.108223.

- Choudhary A, Kumar A, Kumar S, Verma, V. 2021.Energy possibilities and future strategies for municipal solid waste in Himachal Pradesh. **Materials Today: Proceedings (Journal)**. 48, Part 5, 2022, 1455-1459.

- Thakur P, Kumar, S. 2020. Metallurgical processes unveil the unexplored "sleeping mines" e-waste: a review. **Environmental Science and Pollution Research**. 26. 32359-32370.

- Choudhary A, Kumar A, Kumar S. 2020. Techno-economic analysis, kinetics, global warming potential comparison and optimization of a pilot-scale unheated semi-continuous anaerobic reactor in a hilly area: For north Indian hilly states. **Renewable Energy**. 155, 1181-1190.

- Choudhary A, Kumar A, Kumar S. 2020. National Municipal Solid Waste Energy and Global Warming Potential Inventory: India. **Journal of Hazardous, Toxic, and Radioactive Waste**. https://ascelibrary.org/doi/full/10.1061/%28ASCE%29HZ.2153-5515.0000521.

- Govil T, Saxena, P, Samanta D, Singh S.S. Kumar S, Salem D.R, Sani, R.K. 2020 Adaptive Enrichment of a Thermophilic Bacterial Isolate for Enhanced Enzymatic Activity. **Microorganisms.** 8(6), 871. DOI: 10.3390/microorganisms8060871.

- Choudhary A, Kumar A, Govil T, Sani, R K, Gorky, Kumar S. Sustainable Production of Biogas in Large Bioreactor under Psychrophilic and Mesophilic Conditions. 2020. **Journal of Environmental Engineering**, 146 (3): 04019117-1-10.

- Verma R, Bhalla A, Kumar S. 2020 (March). Valorization of Lignocellulosic Residues for Cost-Effective Production of Thermo-Alkali-Stable Xylanase by Geobacillus thermodenitrificans X1 of Indian Himalayan Hot Spring. **Waste and Biomass Valorization.** 11(3), 1205-1215.

- Govil T, Sharma, W, Chauhan N, Kumar, S, Salem, D.R, Sani. R.K. 2019. MINES: method for genomic DNA extraction from deep biosphere biofilms. **Journal of Microbiological Methods**, 167 DOI: 10.1016/j.mimet.2019.105730

- Verma R, Kumar A, Kumar S. 2019. Synthesis and characterization of cross-linked enzyme aggregates (CLEAs) of thermostable xylanase from *Geobacillus thermodenitrificans* X. **Process Biochemistry.** 80, 72-79.

- Bibra M, Kumar S, Wang J, Bhallla A, Salem D, Sani RK. 2018. Single pot bioconversion of prairie cordgrass into biohydrogen by thermophiles. **Bioresource Technology.** 266: 232-241.

- Kumar A, Saini H S, Kumar S. 2018. Enhancement of gold and silver recovery from discarded computer printed circuit boards by *Pseudomonas balearica* SAE1 using response surface methodology (RSM). **3Biotech**; https://doi.org/10.1007/s13205-018-1129-y.

- Kumar A, Saini H S, Kumar S. 2018. Bioleaching of gold and silver from waste printed circuit boards by *Pseudomonas balearica* SAE1. **Current Microbiology**; 75(2): 194-201.

- Sahni A, Kumar A, Kumar S. 2016. Chemo-biohydrometallurgy—A hybrid technology to recover metals from obsolete mobile SIM cards. **Environmental Nanotechnology, Monitoring & Management.** 6, 130-133.

- Kumar A., Devi, R., Kumar S. 2016. Use of pine needles as substrate for biogas production. ***IJRER***. 6(4), 1242-1247. [ISSN: 1309-0127]

- Devi, R., Kumar A, Kumar S. 2016. Comparison of biogas production in ambient temperature condition and under green house canopy. **JCEET**. 3(6), 495-499. [ISSN: 2349-8404]
- Tripathi, AK, Kumari M, Kumar A, Kumar S. 2015. Generation of biogas using pine needles as substrate in domestic biogas plant. **IJRER**. 5(3), 716-721. [ISSN: 1309-0127]

- Pradhan JK, Kumar S. 2014. Informal e-waste recycling: environmental risk assessment of heavy metal contamination in Mandoli industrial area, Delhi, India. **Environ. Sci. Pollut. Res.** 21(13), 7913-7928.

- Singh, G, Sengor SS, Bhalla A, Kumar S, De J, Brandy S, Spycher N, Ginn TM, Peyton BM, Sani RK. 2014. Reoxidation of Biogenic Reduced Uranium – A Challenge Towards Bioremediation. **Crit. Rev. Environ. Sci. Technol.** 44, 391-415.

- Charan G, Bharti VK, Jadhav SE, Kumar S, Acharya S, Kumar P, Gogoi D, Srivastava RB. 2013. Altitudinal variations in soil physic-chemcial properties at cold desert high altitude. **Journal of Soil Science and Plant Nurition.** 13 (2), 267-277.

- Rastogi G, Gurram RN, Bhalla A, Gonzalez R, Bischoff KM, Hughes SR, Kumar S, Sani RK. 2013. Presence of glucose, xylose, and glycerol fermenting bacteria in the deep biosphere of the former Homestake gold mine, South Dakota. ***Front. Microbiol.*** doi: 10.3389/fmicb.2013.00018.

- Bhalla A, Bansal N, Kumar S, Bischoff KM, Sani R. 2013. Improved Lignocellulose Conversion to Biofuels with Thermophilic Bacteria and Thermostable Enzymes. **Bioresour. Technol.** 128:751-759.

- Charan G, Bharti V K, Jadhav S E, Kumar S, Angchok D, Acharya S, Kumar P, Srivastava RB. 2012. Altitudinal variations in soil carbon storage and distribution patterns in cold desert high altitude microclimate of India. **African Journal of Agricultural Research** 7(47), 6313-6319 [ISSN: 1991637X]

- Pradhan JK, Kumar S. 2012. Metals Bioleaching from Electronic Waste by Chromobacterium violaceum and Pseudomonad sp. **Waste Management and Research.** 30(11), 1151-1159.

- Kumar S, Bhalla A, Shende RV, Sani R. 2012. Decentralized thermophilic biohydrogen: A more efficient and cost-effective process. **BioResources.** 7(1), 1-2.

- Nema A, Aishwarya, Bajaj P, Singh H, Kumar S. 2011. A case study: biomedical waste management practices at city hospital in Himachal Pradesh. **Waste Management and Research**. 29(6), 669-73.

- Kumari M, Kumar S, Ravikanth K, Chauhan RS. 2011. Bioconversion of herbal industry waste into vermicompost using an epigeic earthworm Eudrilus eugeniae. **Waste Management and Research**. 29(11), 1205-1212.

- Kumari M, Kumar S, Ravikanth K, Chauhan RS. 2010. Pretreatment and saccharification of steam exploded waste of pharma industry. **International Journal of Pharma and Bio Science**. 1(2) 1-7. [ISSN-2230-7605]

- Jatindra, PK, K Sudhir. 2009. E-Waste Management: A case study of Bangalore, **India. Res. J. Environmental - Earth Sciences** .1 (2) 111-115.[ISSN: 2041-0492]

- Kumari M, Kumar S. 2009. Biorefineries: India's future option for energy and chemical feedstock. **As. J. Energy Env**. 10 (3) 160-164. [ISSN: 1513-4121]

- Syal S. 2008. Bioterrorism: Time to wake up. **Current Science**. 95 (12) 1665-1666.

- Awasthi P, Sood Isha, Syal S. 2008. Isolating diesel - degrading bacteria from air. **Current Science**. 94 (2) 178-180.

- Syal S, Ramamurthy V. 2007. Potential of Biostimulation and Bioaugmentation in diesel spill bioremediation of soil environments. **Ecochronicle**. 4, 197-202. [ISSN : 0973 – 4155]

- Syal S, Ramamurthy V. 2003. Influence of plants on degradation of diesel in soil. **Asian Journal of Microbiology, Biotechnology and Environment.** 5, 353-358. [ISSN: 09723005]

- Syal S, Ramamurthy V. 2003. Characterization of biosurfactant from a diesel degrading isolate. **Indian Journal of Microbiology**. 43,175-180.

Short Scientific Letters in Journals

- Verma R, Kumar A, Kumar S. 2016. CO_2 levels and coral reefs. 2016. **Current Science**. 111(08). 1288.

- Mishra M, Shrivastava R, Kumar S. 2014. Pops pills at will: implications of self medication. **Current Science**. 106(1) 9.

- Kumar S. 2013. Bio-toilets for Indian Railways. **Current Science**. 104 (3) 283.

- Kumar S. 2012. Clean stoves already in use in rural India. **Nature**. 491, 333.

- Kumar S. 2010. Fast track funding units - An option to attend international conferences. **Current Science**. 99 (11) 1494.

- Syal S, Kumari M. 2009. Biofuels: concerns about substrate selection. **Current Science**. 96 (5) 630.

- Aishwarya, Syal S. 2008. Time for methanol revolution. **Current Science**. 95 (10) 1383- 1384.

- Gupta V, Laul P, Syal S. 2008. E-Waste - A waste or a fortune. **Current Science** 94(2) 554-555.

- Rastogi R, Singh S, Syal S. 2008. Woods to Wheels. **Current Science** 94 (6) 699.

Refereed National/International Conference/Symposium Publications

1. Pooja Thakur, Anil Kumar, Jatindra Kumar Pradhan, Sudhir Kumar (2024) Urban Mining of e-scrap – Biohydrometallurgy is the future. Conference on Science at the Sanford Underground Research Facility, SD Mines, SD, Rapid City, USA. (14-17 May, 2024).

2. Vijay K Bharti, Guru Charan, Arup Giri, Sudhir Kumar, OP Chaurasia (2023) Water quality of various water resources in the cold desert high-altitude region of Ladakh, India. In an national conference on Environment, water, agriculture, sustainability and health strategizing a greener future (22-23 December, 2023).

3. Chirag Abrol, Nikunj Sharma, Tanvi Govil, Sudhir Kumar, Rajesh K Sani (2023) Preparations and Characterization of Polyhydroxyalkanoates Films for use as Biodegradable Functionalized Films or Beads. International Conference on Biotechnology and Bioinformatics, Jaypee University of Information Technology, Himachal Pradesh, India (July 11-13, 2023).

4. Abrol C, Sharma N, Govil T, Kumar S and Sani RK. (2023) Shashwat Sharma, Dipayan Samanta, Tanvi Govil, Sudhir Kumar, Rajesh K Sani (2023). Exopolysaccharide production and extraction from Thermophilic Geobacillus sp. WSUCF1 and Methanotrophic *Methylosinus trichosporium* strain OB3b. International Conference on Biotechnology and Bioinformatics, Jaypee University of Information Technology, Himachal Pradesh, India. (July 11-13, 2023)

5. Shanzi Dsilva, Payal Thakur, Sudhir Kumar, Rajesh K Sani (2023) Exploring Biofilm forming capabilities of *Oleidesulfovibrio alaskensis* G20 and its mutants for the prevention of Biocorrosion. International Conference on Biotechnology and Bioinformatics, Jaypee University of Information Technology, Himachal Pradesh, India. (July 11-13, 2023)

6. Smriti Gaba, Aaina Sharma, Karam Dass, Ashish Kumar, Sudhir Kumar (2022) Biogas production using one-stage reactor. In in a National Conference on Current Scientific Innovations & Research in Plant Biology (May 27-28, 2022) at Eternal University, Baru Sahib, Sirmour, HP.

7. Smriti Gaba, Ashish Kumar, Sudhir Kumar (2021) Sustainable management of biomass for energy generation. In an International Conference on Renewable Energy for Sustainable Environment organized by. Centre of Excellence in Sustainable Technologies for Rural Development [CESTRD] Department of Biotechnology & Bioinformatics Jaypee University of Information Technology Waknaghat, 24-25 November 2021) –[abstract only].

8. Shivangini Singh, Sunainy Ajrawat, Sudhir Kumar*(2020) Isolation of metal tolerant microorganisms from natural environment and to analyze their metal bioleaching

capabilities. A Virtual International Conference on Technologies for Environmental Sustainability and Smart Agriculture Centre of Excellence in SustainableTechnologiesfor Rural Development [CESTRD] Department of Biotechnology & Bioinformatics Jaypee University of Information Technology Waknaghat, 18-19 Sep 2020) –[abstract only].

9. Ritika Verma , Aditya Bhalla and Sudhir Kumar(2020) Valorization of agricultural residues for sustainable production of thermo-alkali-stable xylanase A Virtual International Conference on Technologies for Environmental Sustainability and Smart Agriculture Centre of Excellence in SustainableTechnologiesfor Rural Development [CESTRD] Department of Biotechnology & Bioinformatics Jaypee University of Information Technology Waknaghat, 18-19 Sep 2020) –[abstract only]

10. Pooja Thakur, Sudhir Kumar*(2020) E-waste: Core of "Urban Mining" and Its Eating Microbes A Virtual International Conference on Technologies for Environmental Sustainability and Smart Agriculture Centre of Excellence in SustainableTechnologiesfor Rural Development [CESTRD] Department of Biotechnology & Bioinformatics Jaypee University of Information Technology Waknaghat, 18-19 Sep 2020) –[abstract only]

11. Natasha Panchal*, Ashish Kumar* Sudhir Kumar*(2020) Apple pomace: A potential source of energy and its management A Virtual International Conference on Technologies for Environmental Sustainability and Smart Agriculture Centre of Excellence in SustainableTechnologiesfor Rural Development [CESTRD] Department of Biotechnology & Bioinformatics Jaypee University of Information Technology Waknaghat, 18-19 Sep 2020) –[abstract only]

12. Namita Passi , Sudhir Kumar and Anil Kumar (2020) E-waste: a treasure warrants special attention A Virtual International Conference on Technologies for Environmental Sustainability and Smart Agriculture Centre of Excellence in SustainableTechnologiesfor Rural Development [CESTRD] Department of Biotechnology & Bioinformatics Jaypee University of Information Technology Waknaghat, 18-19 Sep 2020) –[abstract only]

13. Saxena P., Govil T., Kumar S., Salem, D.R., Sani, R.K. (2019) Adaptive enrichment of an extremophilic bacterial isolate results in increased enzymatic activity. International Conference on Recent Trend in Biotechnology and Bioinformatics (ICBAB- 2019), JUIT Waknaghat, 01-03 Aug 2019) –[abstract only]

14. Sharma, V., Samanta, D., Kumar S., Salem, D.R., Sani, R.K. (2019) Copper: A key in regulation and expression of particulate methane monooxygenase enzyme. International Conference on Recent Trend in Biotechnology and Bioinformatics (ICBAB- 2019), JUIT Waknaghat, 01-03 Aug 2019) –[abstract only]

15. Solanki, S., Govil, T., Kumar S., Salem, D.R., Sani, R.K. (2019) Improved Bioconversion of Corn Stover into Polyhydroxyalkonate (PHA) using Geobacillus sp. Biofilm International Conference on Recent Trend in Biotechnology and Bioinformatics (ICBAB- 2019), JUIT Waknaghat, 01-03 Aug 2019) –[abstract only]

16. Thakur, P., Govil, T., Kumar S., Salem, D.R., Sani, R.K. (2019) Comparative study of the effects of cold plasma and electroporation on bacterial cells to enhance the substrate utilization. International Conference on Recent Trend in Biotechnology and Bioinformatics (ICBAB- 2019), JUIT Waknaghat, 01-03 Aug 2019) –[abstract only]

17. Thakur, P., Kumar, S. (2019). Bioleaching metals from obsolete electronic products. International Conference on Recent Trend in Biotechnology and Bioinformatics (ICBAB- 2019), JUIT Waknaghat, 01-03 Aug 2019) –[Poster Presentation by Thakur, P.]

18. Thakur P., Kumar A., Kumar, S. (2018) Bioremediation and management of e-waste. In 3rd Himachal Pradesh Science Congress, IIT Mandi, Himachal Pradesh (22-23 October, 2018) – [Poster presentation by Thakur, P].

19. Saxena, P., Verma, R., Kumar, S. (2018) Effective metal-catalzyed oxidative delignification of wheat straw. In 3rd Himachal Pradesh Science Congress, IIT Mandi, Himachal Pradesh (22-23 October, 2018) – [Poster presentation by Verma, R].

20. Choudhary, A., Kumar, A., Kumar, S. (2018) Biogas generation from co-digestion of lignocellulosic and kitchen waste. In 3rd Himachal Pradesh Science Congress, IIT Mandi, Himachal Pradesh (22-23 October, 2018) – [Oral presentation by Choudhary, A].

21. Kumar A., Saini H.S., Kumar, S. (2017). Bioleaching of e-waste for precious recovery using cyanogenic bacteria. In International Conference on Innovative Research in Engineering, Science & Technology at Eternal University, Baru Sahib, Himachal Pradesh (7-8 April, 2017) – [Oral Presentation by Anil Kumar]

22. Sethi P., Verma R., Kumar S. (2017). Bioprospecting for xylanse producing bacteria with potent application in lignocellulosic conversion. In International Conference on Innovative Research in Engineering, Science & Technology at Eternal University, Baru Sahib, Himachal Pradesh (7-8 April, 2017) – [Oral Presentation by Pragya Sethi]

23. Biogas production using sludge with codigestion of pine needles. (2017). Kumari A., Gorky, Kumar A., Kumar S. In International Conference on Innovative Research in Engineering, Science & Technology at Eternal University, Baru Sahib, Himachal Pradesh (7-8 April, 2017) – [Oral Presentation by Ankita Kumari]

24. Kumar S & Kumar A. Participated in a seminar on Renewable Energy: Sustaining a Green Future." Organized by HP State Council for Science, Technology and Environment, Shimla (23 March, 2017).

25. Kumar S, Jain S, Singh P.K. (2017) participated in day workshop on IPR organized by HP Patent Information Centre at HFRI, Panthaghati, Shimla (25 November, 2017) –[Presentation by Dr. Sudhir Kumar].

26. Kumar A. Patial G. Saini H.S. Kumar S. (2016). Development of sustainable bioleaching technology for precious metals recovery from e-waste. In National Seminar on issues of E-waste Management at Govt. Degree College, Arki, Solan, Himachal Pradesh (17 December 2016) – [Oral Presentation by Anil Kumar].

27. Verma R. Kumar A. Tripathi A.K. Kumar A. and Kumar S. (2015). Biogas for community services". In Conference Proceedings (full paper) National biogas convention,113-122. IIT Delhi. (15-16 September, 2015).

28. Kumar A, Dhammi P, Saini H.S. and Kumar S. Development of integrated treatment systems for resource recovery and bioremediation of e-waste. In a National Workshop on "Recent Trends in Environmental Science and Carbon Management'' (RTCM-2015). 19-20 November, 2015. Central University of Himachal Pradesh, Dharamshala (Best Poster Award).

29. Pandita M., Kanwar S., Kumar S. (October 28-29, 2014) Diesel degradation by *Acinetobacter* species for bioremediation of contaminated soil ecosystem. In a national conference at Botany Department, Panjab University, Chandigarh. [Poster presentation by Pandita M. & Kanwar S]

30. Kumar A., Sharda, M., Sharma P., Saini H.S., Kumar, S. (October 15-16, 2014) Development of sustainable bioleaching technology for recovery of precious metals (Au, Ag and Pt.) from e-waste and biodegradation of polybrominated aromatic fire retardants. 1st Himachal Pradesh science congress on Role of Science and Technology for Sustainable Development in H.P [Oral presentation by Kumar, S., Best Oral Presentation Award].

31. Kumar A., Saini H.S., Kumar, S. (August 29-30, 2014) Exploration of novel bacterial species from the abandoned gold mine for bioleaching and enhancement of gold recovery from E-Waste. International Conference on Life Sciences, Informatics, Food and Environment, Jaypee Institute of Information Technology, Noida. [Poster presentation by Kumar, A., - best poster award]

32. Kumari M., Tripathi A., Kumar S. (January 17-18, 2014) Biogas production using food waste. National conference on Emerging horizons in Science and Technology:

Shri Guru Granth Sahib World University, Fatehgarh Sahib, Punjab. [Poster presentation by Tripathi, A.]

33. Rana A, Kumar S. (January 17-18, 2014) Bioleaching of precious metals from printed circuits board. National conference on Emerging horizons in Science and Technology: Shri Guru Granth Sahib World University, Fatehgarh Sahib, Punjab. January 17-18, 2014. [Oral presentation by Rana, A.]

34. Agrawal S., Kumar S. (January 17-18, 2014) Characterization of cellulose degrading alkaliphillic bacteria from. National conference on Emerging horizons in Science and Technology: Shri Guru Granth Sahib World University, Fatehgarh Sahib, Punjab. January 17-18, 2014. [Oral presentation by Agrawal, S.]

35. Kumari M., Kumar A., Kumar S. (March 30-31, 2013) Biogas production using food waste. National conference on environmental sustainability and society: The growing paradigm shift. JUET, Raghogarh, Guna. [Oral presentation by Kumar, S.]

36. Kansra A., Kumar S. Microalgae: (March 30-31, 2013) Third generation biofuels. National conference on environmental sustainability and society: The growing paradigm shift. JUET, Raghogarh, Guna. March 30-31, 2013[abstract]

37. Kainth A, Bhalla A, Kumar S, Sani R K. (October 25, 2012) Extremophilic bioprocessing of lignocellulose-based renewables for biofuels. 7th Annual South Dakota Biotechnology Summit and Annual Meeting, Sioux Falls, SD. USA. [poster presentation by Amoldeep Kainth]

38. Kumar S, Winckel A, Bhalla A, Sani, RK. (August 12 – 15, 2012) Consolidated biohydrogen production from extruded prairie cord grass by Thermoanaerobacterium sp. strain K1. In SIMB annual meeting at Washington Hilton hotel, Washington DC, USA [Invited talk by Kumar, S.]

39. Sani RK, Bhalla A, Kumar S, Bischoff KM. (August 12 – 15, 2012) Improved lignocelluloses conversion to biofuels with thermophilic bacteria. In SIMB annual meeting at Washington Hilton hotel, Washington DC, USA [Invited talk by Sani, RK]

40. Sani RK, Kumar S, Bhalla A, Winckel A. (August 12 – 15, 2012) Challenges of biohydrogen production at industrial scale. In SIMB annual meeting at Washington Hilton hotel, Washington DC, USA [Invited talk by Sani, RK]

41. Bhalla A, Kumar S, Bischoff KM, Sani RK. (August 12 – 15, 2012) Improved lignocelluloses conversion to fermentable sugars using thermostable enzymes. In SIMB annual meeting at Washington Hilton hotel, Washington DC, USA [Poster presentation by Bhalla, A]

42. Kumar S, Kumari M, Kalia T, Chauhan RS, Ravikanth K, Sani RK. (October 13, 2011) A green approach for industrial herbal waste management and its bioremediation. Eastern South Dakota Water Conference, Brookings, South Dakota, USA (Oral presentation by Kumar S.]

43. Kumar, S., Kumari, M., Pradhan, JK., Nema, A., Kalia, T. (October 11, 2011) Biological Treatment of Solid Waste: An Overview. Invited seminar talk at Department of Chemical and Biological Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota, USA. [Invited talk by Kumar, S.]

44. Bhalla, A., Kunreddy, V., Kumar, S., Bischoff, KM., Christopher, LP., Hughes, SR., and Sani RK. (October 16-21, 2011) Thermostable Cellulases and Xylanases. AIChE, Annual Meeting, Minneapolis Convention Center, Minneapolis, USA. [Oral presentation by Bhalla, A.]

45. Bhalla, A., Kunreddy, V., Kumar, S., Bischoff, KM., Hughes, S., and Sani RK. (September 11-16, 2011) Enhanced Lignocellulose Conversion Using Thermophilic Microbes and their Thermostable Enzymes. In Thermophiles Conference 2011, Big Sky, Montana, USA [Poster presentation by Bhalla, A.]

46. Sani, RK., Bhalla, A., Kunreddy, V., Kumar, S., Rastogi, G., Bischoff, KM., Hughes, S., and Christopher, LP. (July 24-29, 2011) Improving Lignocellulose Degradation with Thermostable Enzymes – In SIM annual meeting, in Shelton Hotel, New Orleans, Louisiana, USA [Invited talk by Sani., R.]

47. Jaswal, R., Kumar S., Squillace, E., Singh, G., Kukkadapu, R., Dohnalkova, A., Peyton, B.M., Spycher, N., Ginn, T.N., Sani, R. (July 24-29, 2011) Bioreduced uranium transport potential under sulfate reducing conditions: Effects of Fe(III)(hydro)oxides. In SIM annual meeting, in Shelton Hotel, New Orleans, Louisiana, USA [Poster presentation by Jaswal, R.]

48. Bhalla, A., Kumar, S., Bischoff, KM., Christopher, LP., Hughes, SR., and Sani, RK. (July 24-29, 2011) Overexpression of thermostable enzymes: Lignocellulose hydrolysis. In SIM annual meeting, in Shelton Hotel, New Orleans, Louisiana, USA [Oral presentation by Bhalla, A.]

49. Kumar, S., Winckel, A., Bhalla, A., Jaswal, R., Tungal, R., Shende, RV., and Sani, RK. (July 24-29, 2011) Biohydrogen Production from lignocellulosic biomass in a single step process using thermophiles. In SIM annual meeting, in Shelton Hotel, New Orleans, Louisiana, USA [Poster presentation by Kumar, S.]

50. Kumar, S., Kumari, M., Verma, T., Kalia, T., Chauhan, R.S., Ravikanth, K.,"Solid waste management vis a vis rural community empowerment: Indian perspective." In a

meeting of Sigma Xi association in Rapid City, South Dakota, USA. (17 May, 2011) [Invited talk by Kumar, S.]

51. Bhalla, A., Kunreddy, V., Kumar, S., Bischoff, K.M., Christopher L.P., Hughes, S.R., Sani, R. (April 26, 2011) “Thermostable cellulases and xylanses”. In South Dakota Biotech. Expo. In Ramkota Hotel, Sioux Falls, South Dakota. USA [Poster presentation by Bhalla, A. and Kumar S.]

52. Kumar, S. Participated in a one day conference on April 15, 2011 on Green Energy and Sustainability at South Dakota School of Mines and Technology, Rapid City, South Dakota, USA.

53. Kumar S. Participated in CBRD (Centre for Bioprocessing Research and Development) Advisory Board Meeting. March 10-11, 2011. South Dakota School of Mines and Technology, Rapid City, South Dakota, USA.

54. Kumari, M., Kumar, S. (October 27-29, 2010) Anaerobic digestion of lignocellulosic biomass for biogas production. Delhi International Renewable Energy Conference (DIREC) Knowledge Park (II), Noida. [Oral presentation by Kumari, M.]

55. Kumar, S., Kumari, M., Ravikanth, K., (February 11-12, 2010). Herbal waste: A waste or a fortune. In 7th International Biofuels Conference held at Hotel Le-Meridian organized by Winrock International India, New Delhi, India.[Oral presentation by Kumar, S.]

56. Kalia, T., Kumar, S. (January 18-19, 2010). Municipal Solid Waste: Indian Perspective, Towards A Greener Future. In an International conference on "New Frontiers in Biofuels" held at The Indian Habitat Centre, organized by Delhi Technological University, New Delhi, India. [Poster presentation by Kalia, T.]

57. Syal S, Sood I. (October 27-29, 2009) Production of Biosurfactant on diesel by Pseudomonas aeruginosa strain isolated from air. In conference on, 'Contaminated Site Management in Europe.' Ghent, Belgium. [Oral presentation by Kumar S.]

58. Pradhan, J.K., Kumar, S. (October 21-23, 2009). A case study of E-waste management of India. In an International Conference on Biotechnological Solutions for Environmental sustainability organized by School of Biosciences and Technology VIT university, Vellore, Tamil Nadu.[Poster presentation by Pradhan, JK.]

59. Bhatia, M., Syal, S., Chauhan, R., Ravikanth, K. (March 4-5, 2009). Bioconversion of herbal waste to bioethanol. 6th international biofuel conference in New Delhi. [Oral presentation by Kumari, M.]

Book Chapters

- Ankur Choudhary, Ashish Kumar, Sudhir Kumar. Co-Digestion of Lignocellulosic Wastes with Food Waste for Sustainable Biogas Production. In: Microbial Biotechnology for Renewable and Sustainable Energy Edited by Jitendra Kumar Saini and Rajesh K Sani. Springer. 2022, 77-97.

- Sudhir Kumar, Aditya Bhalla, Mohit Bibra, Jia Wang, Kayla Morisette, Subramanian M. Raj, David Salem, and Rajesh K. Sani. Thermophilic Biohydrogen Production: Challenges at the Industrial Scale." Bioenergy Opportunities and Challenges Edited by R. Navanietha Krishnaraj, Jong-Sung Yu. Apple Academic Press.

- Mohit Bibra, Jia Wang, Phillip Squillace, Rebecca Pinkelman, Sam Papendick, Steven Schneiderman, Vanessa Wood, Vinod Amar, Sudhir Kumar, David Salem, and Rajesh K. Sani: Biofuels and Value-added Products from Extremophiles. In: Advances in Biotechnology edited by N.N. Nawani, M. Khetmalas, P.N. Razdan, A. Pandey. I.K. International Publishing House, 2015, pp. 17-51.

- Ritika Verma, Abhilash Kumar Tripathi, Sudhir Kumar. Conversion of Lignocellulosic feedstocks into biogas. Edited by Rajesh K. Sani and N.K. Rathinam. Springer, 2018, pp 111-143.

Invited Talks:

- Invited talk on Biohydrometallurgy in a conference on Science at Sanford Underground Research Facility, SD Mines, SD, USA (14 May, 2024).

- Resource Person for a talk on Teaching Philosophy in SDSMT, USA (23 October. 2023).

- Resource Person for Karen M. Swindler Seminar on Community Engagement and Sustainable Biofuels for Rural Population (24 October, 2023).

- Keynote Talk on Biohydrometallurgy by Prof. Sudhir Kumar in symposium of WITS University, Johannesburg, SA in a symposium on "Bioprocessing: Unlocking Prospects for a Sustainable Future", (08 August 2023) Online Mode.

- Invited talk by Prof. Sudhir Kumar for the Cavendish Living Lab (CLL) talk series at the University of Westminster London, UK, (29 August, 2023)

Online Mode.

- Invited talk on “Pine Briquetting Technology” in Rural Science Congress organized by Uttarakhand State Council for Science and Technology, Dehradun (10-12 Feb. 2023).

- Invited talk on “Joy of Teaching” in Teachers’ Training Program of Pinegrove school, Subathu, Himachal Pradesh (15 Feb. 2023).

- Invited talk on “Skill Development of Science Students” in Uttrakhand Science Congress at Graphic Era University, organized by Uttrakhand Council of Science and Technology on 15-16 June, 2022.

- Delivered a plenary lecture on Biogas in a National Conference on Current Scientific Innovations & Research in Plant Biology (May 27, 2022) at Eternal University, Baru Sahib, Sirmour, HP. Talk was on Biogas Production using single stage reactor.

- Resource person for an interactive session on “Bioenergy from Food Waste” invited by Swachhta Committee of Sciences of MCM DAV College for Women, Chandigarh.(06 February, 2021).

- Prof. Sudhir Kumar as Resource person in a Faculty Development Program of UGC – Human Resource Development Centre of Guru Nanak Dev University, Amritsar (11 January, 2022). His talk was on Biouels – A way forward towards Sustainable Development

- Resource person for UGC-Faculty Induction Program and delivered a webinar on “Ways of Teaching and Learning” for Faculty members newly inducted in various Govt. Colleges/Universities of India. This was arranged by UGC – Human Resource Development Centre of Guru Nanak Dev University, Amritsar (11 December, 2020).

- Resource person for UGC-Refresher Course on Environment Conservation and delivered a webinar on “Biogas Technology and Environmental Conservation” This was arranged by UGC – Human Resource Development Centre of Guru Nanak Dev University, Amritsar (24 November, 2020).

- Webinar on E-waste and health Care in a webinar series of Centre of Excellence in Health Care Technologies and Medical Informatics, JUIT, Waknaghat, Solan 09 October, 2020

- Resource Person in Faculty Induction Programme, UGC Human Resource Development Centre, Guru Nanak Dev University, Amritsar, Punjab. 24 September, 2020. Talk was on Teaching and Learning.

- Webinar on Biogas from Food Waste: Himachal Pradesh Tackles the Looming Energy Challenge: Organized by Panjab University Alumni Association, PU Chandigarh 15 September, 2020

- Webinar on Women in rural India- Case of Himachal Pradesh in a National Webinar program of Gender Issues and challenges amidst COVID-19. Organized by HSS Dept. of JUIT, Waknaghat, Solan 24 August, 2020.

- "Biogas Production using one stage portable reactor" in a DBT sponsored workshop at SD College, Chandigarh. 08 February, 2020.

- Biogas Plant fabrication, maintenance and use organized by the Swachh Bharat Mission (Gramin), Drinking Water and Sanitation Department, Ranchi, Jharkhand. 30 July 2018.

- Biogas Production for Sustainable Energy Generation in Rural Himachal Pradesh using one-stage digester." On Launch of GOBAR-DHAN scheme by Ministry of Sanitation and Drinking Water at NDRI, Karnal. 30 April, 2018.

- "Biogas Model of Himachal Pradesh" in Ministry of Sanitation and Drinking Water, New Delhi" – 11 April, 2018.

- Invited Talk on Biogas Production from MSW in a Workshop on Northern Regional Sensitzation workshop to promote societal schemes: Focus – Science & Technology for women. September 2017

- Invited talk on Electronic Waste in a workshop at Govt. College Sanjauli, Shimla, Himachal Pradesh (16 March 2017)

- Electronic waste: Impact and Management in "National Seminar on issues of E-waste Management" at Govt. Degree College, Arki, Solan, Himachal Pradesh (17 December 2016)

- As a resource person for "Extremophilic xylanases for efficient conversion of lignocellulosic biomass" in the second international conference on '"Recent advances in Bio-energy research"- ICRABR- 25 to 27 February 2016 at S.S.S. National Institute of Renewable Energy, Kapurthala, Pb. (An Autonomous Institution of the Ministry of New and Renewable Energy, Govt. of India).

- “Biogas for community service” in the ‘National Biogas Convention 2015” – 15-16 September 2015 at Centre of Rural Development and Technology, IIT Delhi.

- “Solid waste to biofuels” in the first international conference on ‘Recent advances in bio-energy research - ICRABR- 14 to 17 March 2015 at S.S.S. National Institute of Renewable Energy, Kapurthala, Pb. (An Autonomous Institution of the Ministry of New and Renewable Energy, Govt. of India).

- “Bioremediation of e-waste” in an Indo-US workshop on “Anaerobic Microbial Processes for Energy and Environment” 23 December, 2014 at Department of Microbiology, Guru Nanak Dev University, Amritsar, Punjab.

- “Biogas production from solid waste” in an Indo-US workshop on “Anaerobic Microbial Processes for Energy and Environment” 22 December, 2014 at Department of Microbiology, Guru Nanak Dev University, Amritsar, Punjab.

- “Biogas and bio-briquettes from solid waste: Cost effective Models” in a National workshop on renewable energy, 22 November, 2014 organized by Jawaharlal Nehru Government Engineering College, Sundernagar, Mandi, HP.

- As a resource person on the occasion of ‘World Standards Day – 2014’ organized by Bureau of Indian Standards, Govt. of India at Hotel Best Park Inn, Parwanoo, Solan, Himachal Pradesh. The theme of the talk was "Standards level the playing field – Solid waste Trade”, October 14, 2014.

- As a resource person for “Ministry of Rural Development, Govt. of Himachal Pradesh” for conducting a workshop (9^{th} April, 2014) on Solid and liquid waste management in rural Himachal. My talk and demonstration was on “Disposal and usage of kitchen waste.”

- As a resource person for ‘DST-Inspire Program’ on 25th March and 11th February, 2013 organized by Baba Banda Singh Bahadur Engineering College Fatehgarh Sahib, Punjab. The themes of the talk were on ‘Biogas Plant fabrication and production’ and ‘Let us practice and explore science’, respectively.

- As a resource person in a ‘National workshop on renewable energy’ on 2nd March, 2013 organized by J.N. Govt. Engineering College, Sundernagar, Himachal Pradesh. The talk was on ‘Biogas production using solid waste’.

- As a resource person on the occasion of ‘World Standards Day – 2012’ organized by Bureau of Indian Standards, Govt. of India at Hotel Best Western Royal Park, Baddi, Solan, Himachal Pradesh. The theme of the talk was "Less waste, Better Results-Standards Increase Efficiency”, October 17, 2012.

Professional Membership

- Indian Science Congress Association (ISCA)
- Biogas Forum India (BIGFIN)

Adhoc Reviewer

- Waste Management
- Environmental Science and Pollution Research
- Science of the Total Environment
- Waste Management and Research
- Environmental Technology
- Journal of Environmental Chemical Engineering
- FEMS Yeast Research
- Environmental Monitoring and Assessment
- Indian Journal of Biotechnology
- Process Biochemistry

Service

- Sharing of Pine needles' briquettes with local corn vendors. Provided this alternate fuel source as a free sample to them to sensitize them towards these renewable energy sources (2023).
- Training to staff of Chitkara University Baddi, HP on fabrication of biogas plants (2022).
- Training to 3 BRD Air Force personnel on maintenance of biogas plants (October, 2020).
- Fabricated biogas reactor and imparted training to employees of Kanpur Fertilizer Plant, Kanpur on usage and installation procedures of biogas reactors (18-19 July, 2019).
- Training and Maintenance of Biogas reactor of Jaypee Rewa cement Plant, Rewa, M.P. (19-20 June, 2020)
- Imparted training for fabrication of biogas reactors to villagers and school students, Dharampur, Solan, HP (30 March, 2018).
- Imparted training for fabrication of biogas reactors to villagers and school students, Pooghat - Bani, Solan, HP (01 May, 2017).
- Imparted training to villagers and school students, Dharampur, Solan, HP (06 July, 2017).
- Imparted training for fabrication of biogas reactors to villagers and school students, Burmana, Bilaspur, HP (17 January, 2017).
- Imparted training for fabrication of biogas reactors to villagers and school students, Dharampur, Solan (26 December, 2014)

- Imparted training to students of Crow Creek and Lower Brule tribal high schools, South Dakota, USA. The training included basic microbiology and biochemical techniques. (October 25-29, 2011)
- Imparted training to Army Personal of Leh (J & K) Unit on Solid Waste Management at High Altitudes and Fabrication of Biogas Plant, JUIT, Waknaghat, Solan, HP (March, 2010).

Courses

- I am involved in teaching courses to B.Tech./M.Tech students. These are Microbiology, Genetics, Bioenergy and Biofuels, Genetic Counselling.

Academic Awards and International Travel Support

- Travel support by SD Mines University and Jaypee University of information Technology for an invited lecture in a conference at SD Mines, USA (2024).

- Travel support by SD Mines University for an invited lecture in the dept. of Chemical and Biological Engineering, SD Mines, USA. (2023).

- Travel award from DBT, for an invited talk in 62nd annual meeting of Society of Industrial Microbiology and Biotechnology (SIMB) at Washington DC, USA, 2012.

- Travel support to attend an international conference at Ghent, Belgium by Jaypee University of Information Technology, Waknaghat, Solan, HP (2009)

- National Eligibility Test (NET) in Life Sciences - CSIR Category 1996

- Graduate Aptitude Test for Engineering (GATE, Life Sciences) 1996

- State Lecturer Eligibility Test (SLET) - 1996