

Sumanta Mukherjee, PhDEmail: sumanta.prod@bitsindri.ac.in**Education**

- PhD from Mechanical Engineering Department, Indian Institute of Technology, Kharagpur, India
- Master of Technology in Manufacturing Science and Engineering (Mechanical Engineering Department) from Indian Institute of Technology, Kharagpur, India
- Bachelor of Engineering in Production Engineering from Jadavpur University, Kolkata, India

Research Interests

- ✓ Design for additive manufacturing
- ✓ 3D printing (Additive Manufacturing) for biomedical applications
- ✓ Corrosion of biomedical materials
- ✓ Advanced Manufacturing Processes
- ✓ AI in Manufacturing
- ✓ AR/VR/VR in Manufacturing

Externally Sponsored Research Project (as PI/ Co-PI)

S. No.	Project	Amount	Funding agency	Duration
1.	Development of 3D Printed User-specific Assistive Devices for Persons with Disabilities in India (PI)	INR 12,63,000/-	NPIU-MHRD (Govt. of India)	2019–2020
2.	Development of a biomimetic robotic arm for high-temperature operations (PI)	As per actuals	IISCO Steel Plant, SAIL (India)	2023-ongoing
3.	Automated Design and 3D Printing-based Fabrication of Cost-effective Patient-specific Cranioplasty Implants (PI)	INR 33,65,000/-	AI4ICPS (under DST, Govt. of India)	2024-ongoing

Internal Projects

- ✓ 3D printed lightweight knee orthotises for persons with cerebral palsy (in collaboration with National Institute for Locomotor Disabilities, Kolkata, West Bengal, India)
- ✓ 3D printed lightweight braces for scoliosis patients (in collaboration with National Institute for Locomotor Disabilities, Kolkata, West Bengal, India)
- ✓ 3D printed personalized radiotherapy devices for brachytherapy (in collaboration with Chittaranjan National Cancer Hospital, Kolkata, India)

Industry Association

- ✓ Technical Consultant, Printzworldwide Limited
- ✓ Investigator, Center for Promotion of Additive Manufacturing on Smart and Sustainable Packaging

Patents

1. Acetabular cup implant and a method for additive manufacturing of the same based on geodesical dome approach with continuous radially graded porosity (2023), S Mukherjee, S Dhara, and P Saha, Indian Patent No. 424742
2. Preparation of porous structures with controlled and continuous variation by additive manufacturing, S Mukherjee, S Dhara, and P Saha; Indian Patent Application No. 201631013286 dated 20/10/2017

Peer Reviewed Articles in Journals

1. Enhancing the biocompatibility of Ti6Al4V implants by laser surface microtexturing: an in vitro study (2015), S Mukherjee, S Dhara, and P Saha; International Journal of Advanced Manufacturing Technology 76(1-4): 5-15
2. Laser surface remelting of Ti and its alloys for improving surface biocompatibility of orthopaedic implants (2018), S Mukherjee, S Dhara, and P Saha; Materials Technology: Advanced Performance Materials 33(2): 106-118
3. Enhanced Corrosion, Tribocorrosion resistance and Controllable Osteogenic Potential with Alignment of Stem Cells on Micro-rippled Ti6Al4V Surfaces Produced by Pulsed Laser Remelting (2021), S Mukherjee, S Dhara, and P Saha; Journal of Manufacturing Processes 65: 119-133
4. Addressing the challenges in remanufacturing by laser-based material deposition techniques (2021), A Shrivastava, S Mukherjee, and S S. Chakraborty; Optics and Laser Technology 144: 107404
5. Size dependent regeneration capacity of functionalized Capra ear derived micro-tissue scaffolds for treatment of cartilage defects, Materialia, P P Maity, P Poddar, S Das, K Dixit, D Dhara, M Mandal, A Roy Chowdhury, S Dhara, S Mukherjee*, DoI: 10.1016/j.mtla.2022.101569
6. Design and Additive Manufacturing of Acetabular Implant with Continuously Graded Porosity (2023), S Mukherjee*, S Dhara, and P Saha, Bioengineering 10(6), 675
7. Capra cartilage-derived peptide delivery via carbon nano-dots for cartilage regeneration (2023), PP Maity, K Kapat, P Poddar, H Bora, CK Das, P Das, S Ganguly, NC Das, D Dhara, M Mandal, A Roy Chowdhury, S Mukherjee*, S Dhara; Frontiers in Bioengineering and Biotechnology 11:1213932. DoI: 10.3389/fbioe.2023.1213932

Peer Reviewed Chapters in Edited Book Volumes

1. Directed Energy Deposition of Ni-Based Hard-Facing Alloy (2023); V Kumar, A Shrivastava, S S Chakraborty, and S Mukherjee*; In: P Kumar, M Hussain, A K Jain, S Pathak (Eds.), Laser Applications in Manufacturing; CRC Press (Taylor and Francis), Boca Raton. DoI: 10.1201/9781003279501-5

2. Laser Additive Manufacturing of Cemented Carbide (2023); A Shrivastava, A K Singh, A Sadhu, A Chattopadhyay, **S Mukherjee**, S S Chakraborty; In: P Kumar, M Hussain, A K Jain, S Pathak (Eds.), Laser Applications in Manufacturing; CRC Press (Taylor and Francis), Boca Raton. DoI: 10.1201/9781003279501-6

Peer Reviewed Articles in International Conference Proceedings

1. Direct Laser Microgrooving of Ti6Al4V as a Surface Modification Method for Biological Implants (2012); **S Mukherjee**, S Dhara, and P Saha; 21st International Symposium on Processing and Fabrication of Advanced Materials, Guwahati (India)
2. Laser microgrooving of Ti6Al4V and its effect on viability of human Osteoblast-like MG63 cells (2012); **S Mukherjee**, S Dhara, and P Saha; 4th International and 25th All India Manufacturing Technology Design and Research Conference (AIMTDR), Kolkata (India)
3. Influence of Surface Roughness Parameters on MG63 Cell Viability- A Study on Laser Microtextured Ti6Al4V Surfaces (2014); **S Mukherjee**, S Dhara, and P Saha; 41st European Society of Artificial Organs (ESAO) Annual Congress, Rome (Italy), Published in The International Journal of Artificial Organs 37(8) 583-607, <https://doi.org/10.5301/ijao.5000346>
4. A Comparative Study on the 2D and 3D Surface Roughness of Direct Metal Laser Sintered Ti6Al4V (2015); **S Mukherjee**, P Saha, S Dhara, R Sen, S Dutta; 4th National Conference on Advances in Metrology – AdMet 2015, 42-43
5. Creation of Nano-structured oxide Layers through anodization on laser-remelted Ti6Al4V surface for improvement of Its biofunctionalities (2019); P Saha, **S Mukherjee**, S Dhara; 5th International Conference on Nanotechnology for Better Living (NBL-2019), Srinagar, India
6. Application of a MCDM Tool for Selection of 3D Bioprinting Processes (2019); **S Mukherjee**, J P Kumar; 1st International Conference on Innovative Product Design and Intelligent Manufacturing System (ICIPDIMS-19), Rourkela, India, In: Deepak, B., Parhi, D., Jena, P. (eds) Innovative Product Design and Intelligent Manufacturing Systems. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-2696-1_76
7. Effect of process parameters on geometrical aspects in direct metal laser deposition of Ni5Mo5Al hardface coating (2019) V Kumar, A Shrivastava, D P Karmakar, S S Chakraborty, H Roy, M Gopinath, P Kumar, and **S Mukherjee**; IOP Conference Series: Materials Science and Engineering, 576(1), First International Conference on Materials Science and Manufacturing Technology (ICMSMT 2019), Coimbatore, India
8. Estimation of residual stress and deformation of laser deposited tracks of Ni-5Mo-5Al powder using thermo-mechanical finite element simulation (2019) A Shrivastava, V Kumar, V Singh, **S Mukherjee**, P Kumar and S S Chakraborty; IOP Conference Series: Materials Science and Engineering, 576(1), First International Conference on Materials Science and Manufacturing Technology (ICMSMT 2019), Coimbatore, India
9. Mechanical and electrochemical properties of friction stir processed magnesium alloy AZ31 for

biomedical applications: A pilot study (2021) A Priya, A Shrivastava, S Khatun, S S Chakraborty, P Roy, K H Kazmi, P Kumar, **S Mukherjee**; Materials Today: Proceedings, doi: 10.1016/j.matpr.2021.09.384

10. A Review on Friction Stir Welding—A Green Manufacturing Technology (2021) M M Alam, A K Jha, **S Mukherjee**, S Panda, SS Chakraborty; In: Osman Zahid M.N., Abdul Sani A.S., Mohamad Yasin M.R., Ismail Z., Che Lah N.A., Mohd Turan F. (eds) Recent Trends in Manufacturing and Materials Towards Industry 4.0. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-15-9505-9_76

11. Ductility Improvement in Commercially Pure Aluminium by Friction Stir Processing (2021) AK Jha, MM Alam, SS Chakraborty, KH Kazmi, P Kumar, **S Mukherjee**; In: Bag S., Paul C.P., Baruah M. (eds) Next Generation Materials and Processing Technologies. Springer Proceedings in Materials, vol 9. Springer, Singapore. https://doi.org/10.1007/978-981-16-0182-8_3

12. Electrohydrodynamic jet printing for desired print diameter (2021) MH Saba, **S Mukherjee**, S Dutta, PK Mallisetty, and NC Murmu; Materials Today: Proceedings 46, 1749-1754

13. Analysis and optimization of geometry of 3D printer part cooling fan duct (2021) M Choudhary, **S Mukherjee**, P Kumar; Materials Today: Proceedings, doi: 10.1016/j.matpr.2021.10.444

14. 3D printing of single-walled objects (2022) A Agrawal, **S Mukherjee**; Materials Today: Proceedings, doi: 10.1016/j.matpr.2022.06.006

Honors and Awards

- ✓ Qualified in Graduate Aptitude Test in Engineering (GATE) with AIR 17 in PI
- ✓ Awarded institute fellowship for M Tech in IIT Kharagpur
- ✓ Awarded institute fellowship for PhD in IIT Kharagpur

Teaching Experience

- Assistant Professor (TEQIP III) in the Production Engineering Department, BIT Sindri, Dhanbad, Jharkhand, from Sept. '18 - Continuing

Students Supervision

- M.Tech: 10 completed and 2 Ongoing
- PhD: 1 ongoing