

Dr. Sudipto Datta

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Research Interest: Biomaterials, 3D Bioprinting, Tissue engineering and In Vitro Tissue/Organ Models.

Research Expertise:

- **Biofabrication Techniques:** Electrospinning, Spin-coating, Bioprinting, fridge drying etc.
- **3D-bioprinting Techniques:** such as extrusion bioprinting, bioink optimization etc.
- **Software Known:** Solidworks, Sketchup, Autocad 360, Origin, Image J, Ansys.

Academic Qualification:

Ph.D (Awarded) in **Biomedical Engineering** from IEST, Shibpur, West Bengal, India (2022).

M. Tech. in **Materials Science** from IEST, Shibpur, West Bengal, India (2016).

B. Tech. in **Electrical and Electronics Engineering** from West Bengal University of Technology, Kolkata, West Bengal, India (2013).

PhD Thesis: *Extrusion-based bioprinting of fortified alginate bioinks for fabrication of tissue engineered constructs.*

Awards and Achievements:

1. Awarded **institute fellowship** in Masters of Technology from IEST, Shibpur from 2014–2016.
2. Awarded **institute fellowship** for PhD from Indian Institute of Engineering Science and Technology, Shibpur, India from 2016-2021.
3. Qualified in **Graduate Aptitude Test in Engineering (GATE)** in 2013.
4. **Best paper award** at International conference Biospectrum 2019.
5. **Best paper award** at 2nd International Symposium on 3D Printing Technology.
6. **Young Researcher Award 2020** from Institute of Scholars, India

Technology/Product Developed

- Developed 3D bio printed polymeric biomaterial scaffolds by mixing alginate with honey and culturing fibroblast cells on them for skin tissue engineering and regenerative medicine application
- Developed 3D bio printed polymeric biomaterial scaffolds by mixing alginate with amino acids and culturing MG63 osteosarcoma cells on them for bone tissue engineering and regenerative medicine application.
- Force Modelling method for fabrication of hollow channels inside a gel structure
- Developed computational method for rapid optimization of bioinks without printing.
- Developed radio opaque constructs for studying the degradation of the scaffold after implant.
- Developed a novel method to reduce cell death during extrusion bioprinting using antioxidant.

Publications

1. **Sudipto Datta**, Shuvodeep Jana, Ankita Das, Arindam Chakraborty, Amit Roy Chowdhury, Pallab Datta: Bioprinting of radiopaque constructs for tissue engineering and understanding degradation behavior by use of Micro-CT, *Bioactive Materials*, 04/2020; 5(3). <https://doi.org/10.1016/j.bioactmat.2020.04.015>.
2. **Sudipto Datta**, Ankita Das, Amit Roy Chowdhury, Pallab Datta: Bioink formulations to ameliorate bioprinting-induced loss of cellular viability. *Biointerphases* 09/2019; 14(5):051006. DOI:10.1116/1.5111392.
3. **Sudipto Datta**, Ankita Das, Pranabesh Sashmal, Sumant Bhutoria, Amit Roychowdhury, Pallab Datta: Alginate-poly (amino acid) extrusion printed scaffolds for tissue engineering applications. *International Journal of Polymeric Materials* 12/2018; DOI:10.1080/00914037.2018.1539988.
4. **Sudipto Datta**, Ripon Sarkar, Veena Vyas, Pallab Datta, Amit Roychowdhury, Ananya Barui: Alginate-honey bioinks with improved cell responses for applications as bioprinted tissue engineered constructs. *Journal of Materials Research* 06/2018; DOI:10.1557/jmr.2018.202.
5. Avinaba Banerjee*, **Sudipto Datta***, Amit Roy Chowdhury, Pallab Datta: A finite element analysis model to predict and optimize the mechanical behavior of bioprinted scaffolds. *3D Printing and Additive Manufacturing* 02/2022 <http://doi.org/10.1089/3dp.2021.0238> (*Equal Contribution*).
6. Ranjit Barua, Himanshu Giria, **Sudipto Datta**, Amit Roy Chowdhury, Pallab Datta: Force modeling to develop a novel method for fabrication of hollow channels inside a gel structure. *Proceedings of the Institution of Mechanical Engineers Part H Journal of Engineering in Medicine* 11/2019; DOI: 10.1177/0954411919891654.

Conference Presentations

1. **Sudipto Datta**, Ranjit Barua, Ankita Das, Amit Roy Chowdhury, Pallab Datta: Fabrication of alginate/poly(γ -glutamic acid) 3D-bioprinted scaffolds and investigating their mechanical physicochemical and biological properties, *Biospectrum* 2019; 11/2019, DOI:10.1201/9781003001614-7
2. **Sudipto Datta**, Ranjit Barua, Ripon Sarkar, A Barui, Pallab Datta: Design and development of alginate: Poly-L-lysine scaffolds by 3D bio printing and studying their mechanical, structural and cell viability properties. *ICAME 2018*; 09/2018, DOI:10.1088/1757-899X/402/1/012113.
3. Dolon Kumar Das, Ranjit Barua, **Sudipto Datta** :Influence of Copper Addition on Mechanical Properties and Microstructure of Eutectic Al-12Si-Xcu Alloy Produced Through Powder Metallurgy Process; 07/2020, DOI: 10.46610/JOAME.2020.v05i02.001
4. Abhinaba Banerjee, Amit Roy Chowdhury, **Sudipto Datta**, Pallab Datta: Cell-Laden alginate biomaterial modelling using three-dimensional (3D) microscale finite element (underreview).

Book Chapter

1. **Sudipto Datta**, Ranjit Barua, Jonali Das: Application of Artificial Intelligence in Modern Healthcare System. *Alginates-Recent Uses of This Natural Polymer*, 12/2019; Intechopen., DOI:10.5772/intechopen.90454
2. **Sudipto Datta**, Ranjit Barua, Jonali Das: Importance of Alginate Bioink for 3D Bioprinting in Tissue Engineering and Regenerative Medicine. *Alginates - Recent Uses of This Natural Polymer*, 12/2019; Intechopen., DOI:10.5772/intechopen.90426
3. Ranjit Barua, **Sudipto Datta**, Amit Roychowdhury, Pallab Datta: Importance of 3D Printing Technology in Medical Fields. *Additive Manufacturing Technologies from an Optimization Perspective*, 01/2019; pages 21-40, ISBN: 9781522591696, DOI:10.4018/978-1-5225-9167-2.ch002
4. Ranjit Barua, **Sudipto Datta**, Pallab Datta, Amit Roy Chowdhury: Scaffolds and Tissue Engineering Applications by 3D Bio-Printing Process. *Design, Development, and Optimization of Bio-Mechatronic Engineering Products*, 01/2019; pages 78-99, ISBN: 9781522582366, DOI:10.4018/978-1-5225-8235-9.ch004
5. Ranjit Barua, **Sudipto Datta**, Amit Roychowdhury, Pallab Datta: Advances in MEMS and Micro-Scale Technologies for Application in Controlled Drug-Dosing Systems: MEMS-Based Drug Delivery Systems. *Design and Development of Affordable Healthcare Technologies*, 05/2018; IGI GLOBAL.
6. Ranjit Barua, **Sudipto Datta**, Jonali Das: Application of Nanotechnology in Global Issues: Global Issues and Innovative Solutions in Healthcare, Culture, and the Environment, pages 292-300; IGI GLOBAL
7. Ranjit Barua, **Sudipto Datta**, Amit Roychowdhury, Pallab Datta: Study the Bioprinting Process in Biomedical and Tissue Engineering Fields: 2020; SSRN.
8. Ranjit Barua, **Sudipto Datta**, Jonali Das: A Review on Electro-Rheological Fluid (ER) and Its Various

Google Scholar link: <https://scholar.google.com/citations?user=QyKjSpcAAAAJ&hl=en>

Researchgate link: <https://www.researchgate.net/profile/Sudipto-Datta>

Work Experience:

Research Associate, Centre of Nanotechnology, Indian Institute of Technology (IIT), Roorkee, Uttarakhand 247667 India. November 2021 to May 2022.

National Post Doctoral Fellow at Indian Institute of Science, Bangalore (IISc). From Dec 2022 to present.

References:

- 1. Dr. Mitrajit Ghosh**
Science Research Specialist, Laboratory of Molecular Neurobiology,
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- 2. Prof. Asit Kumar Das**
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