

Prerak Gupta, Ph.D.

Assistant Professor

Department of Biological Science & Engineering
MANIT, Bhopal, India

Former American Heart Association Postdoctoral Fellow (two times)

Former Fulbright-Nehru Doctoral Research Fellow

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Research Interests

Biomaterials and tissue engineering, regenerative medicine, tissue-engineered vascular grafts, engineered extracellular vesicles, bioengineering, single cell encapsulation and mechanobiology, stem cell biology, vascular biology, nano-biotechnology, matrix biology, blood-biomaterials interface, immunomodulation and immune engineering, drug delivery, sepsis

Academic Positions, Scientific Appointments, and Honors

Academic Positions

March 2026-present	Assistant Professor, Department of Biological Science & Engineering, MANIT Bhopal, India
2025-2026	Research Fellow, University of Michigan Ann Arbor, USA Supervisor: Prof. Jae-Won Shin
2021-2025	Postdoctoral Research Associate, University of Illinois at Chicago, USA Supervisor: Prof. Jae-Won Shin
2015-2021	Ph.D. Student, Department of Biosciences and Bioengineering, Indian Institute of Technology Guwahati, India [10/10 CGPA in Course work] Supervisor: Prof. Biman B. Mandal
2014-2015	Junior Research Fellow, Department of Biosciences and Bioengineering, Indian Institute of Technology Guwahati, India Supervisor: Prof. Biman B. Mandal
2012-2014	Masters Student (M.Tech), Biotechnology and Medical Engineering, Department of Biotechnology and Medical Engineering, National Institute of Technology Rourkela, India [2nd position out of 20 students] Supervisor: Prof. Indranil Banerjee
2008-2012	Bachelors Student (B.Tech), Biotechnology (Molecular and Cellular Engineering), Jacob School of Biotechnology and Bioengineering, SHUATS, Allahabad, India [3rd position out of 180 students]

Scientific Appointments

Review Editor	Nanotoxicology, Frontiers in Toxicology
Review Editor	Biomedical Nanotechnology, Frontiers in Nanotechnology
Review Editor	Biomaterials Science for Regenerative Therapies, Frontiers in Biomaterials Science
Reviewer	Biomaterials, Acta Biomaterialia, Bioactive Materials, ACS Biomaterials Science & Engineering, Materials Today Bio, Materials Today Communications, Journal of Materials Chemistry B, Frontiers in Physiology, Frontiers in Surgery, Blood Pressure, Frontiers in Biomaterials Science, Colloids and Surfaces B: Biointerfaces, Plos One, Scientific Reports

Awards and Honors

2025	Awarded the prestigious American Heart Association (AHA) post-doctoral fellowship for two years (Jan 2026-Dec 2027), which comes with 168,568 USD award money. (Terminated early) (DOI): 10.58275/AHA.26POST1563530.pc.gr.240539
2024	3 rd prize in poster presentation at Departmental Retreat, Department of Pharmacology and Regenerative Medicine, University of Illinois Chicago, USA
2024	Invited speaker, Scientific Sessions during an AHA Early Innovators Spotlight oral session, November 16–18, 2024 at the McCormick Place Convention Center in Chicago, Illinois, USA
2024	Selected speaker, Gordon Research Seminar, Maine, USA
2024	Selected speaker, Ibidi Flow Meeting 2024, Chicago, USA
2024	Awarded the prestigious American Heart Association (AHA) post-doctoral fellowship for two years (Jan 2024-Dec 2025), which comes with 147,292 USD award money. (DOI): https://doi.org/10.58275/AHA.24POST1194264.pc.gr.190939

2023	Selected Speaker, ISEV 2023, Seattle, USA, Featured Abstract Presentation
2023	Junior Investigator Research Award, BMES ABioM Meeting, University of Maryland, USA
2021	Selected Speaker, Cardiovascular Metabolic Week, The International Society for Applied Cardiovascular Biology in Tokyo, Virtual Presentation
2020	Selected Speaker, International Conference on Biomedical Materials Innovation, Bharathiar University, India, Virtual Presentation
2019	Selected Speaker, Combined symposium of The International Society for Applied Cardiovascular Biology and International Society of Vascular Tissue Engineering, University of Zurich, Zurich, Switzerland, 3-minute lightening talk
2019	DST (SERB) Travel grant award, Government of India
2019	Best Poster Award, Research Conclave, IIT Guwahati, India
2019	Best Oral Presentation Award, ICFNM, IIT BHU, India
2017-2018	Fulbright Nehru Doctoral Research Fellow. Award financed by the United States India Education Foundation (USIEF) and Institute of International Education (IIE) New York.
2017	NSF Student Scientist Award at TERMIS–Americas, Charlotte, NC, USA.
2017	Best Poster Award, Research Conclave, IIT Guwahati, India
2014	Second position during master's at NIT Rourkela, India
2014	Qualified GATE (BT), All India Rank 372
2014	Certificate of best paper, NCBMS-2014
2012	Bronze medal during bachelor's at SHUATS, India
2012	Qualified GATE (BT), All India Rank 404
2011	Qualified GATE (BT), All India Rank 1315

Key Research Techniques and Skills

1. **Biomaterial processing and graft fabrication:** Bioaterial purification, electrospinning, lyophilization, molding, decellularization of native tissues, hydrogel synthesis, porous scaffolds, and films fabrication, tubular scaffolds, surface functionalization of biomaterials using click chemistry
2. **Cell culture:** Isolation of primary cells from native tissues, stem cell culture and differentiation, mammalian cell culture, maintenance of cell lines
3. **Material characterization:** Mechanical properties by universal testing machine (UTM) and rheometer, scanning electron microscope (SEM), atomic force microscope (AFM), FTIR
4. **Microscopy:** Confocal microscope, Bright-field and phase contrast microscope, 2-photon microscope, in vivo imaging system (IVIS)
5. **Cell and Molecular Biology:** Immunostaining, Quantification of nucleic acids, Polymerase chain reaction (PCR), Real time polymerase chain reaction (RT-PCR), protein estimation, SDS-PAGE, western blotting, ELISA, cell labeling to study the metabolism, multicolor flow cytometry and cell sorting
6. **Bio-nanotechnology:** Extracellular nanoparticle (EN) isolation, ultracentrifugation, surface modification of vesicular nanoparticles, ligand presentation on EN, Nano-Sight, NS300
7. **Animal handling:** Mice and rat handling, microsurgical implantation of engineered grafts, intraperitoneal/ retro-orbital/ intratracheal injections, imaging under IVIS, organ harvesting for flow cytometry and histology
8. **Microfluidics:** Single cell encapsulation and characterization

Scientific Publications (Research articles, Review articles, Book Chapters and Patents)

➤ **Natural and bio-engineered extracellular nanoscale mediators as biotherapeutics**

1. N.Y. Paik, J. Neethling, M. Anwar, **P. Gupta**, M.A. Sanborn, Z. Shen, T. Bandara, J. Hyun, L.A. Naiche, J.K. Kitajewski, J. Rehman, J.-W. Shin, D. Mehta, K.V. Pajcini, Notch transcriptional target *tmtc1* maintains vascular homeostasis, ***Cellular and Molecular Life Sciences*** 81(1) (2024) 370.
2. **P. Gupta**, K. Debnath, K. Pajcini and J.-W. Shin, Notch functionalized nanovesicles. (*US provisional patent application no. 63/649,999*).

➤ **Modulating 2D and 3D microenvironment to regulate cell functions**

1. **P. Gupta**, G. Hari Narayana S. N, U. Kasiviswanathan, T. Agarwal, S. K, D. Mukhopadhyay, K. Pal, S. Giri, T.K. Maiti, I. Banerjee, Substrate stiffness does affect the fate of human keratinocytes, *RSC Advances* 6(5) (2016) 3539-3551.
2. **P. Gupta**, J.C. Moses, B.B. Mandal, Surface patterning and innate physicochemical attributes of silk films concomitantly govern vascular cell dynamics, *ACS Biomaterials Science & Engineering* 5(2) (2019) 933-949.
3. I.S. Cho, **P. Gupta**, N. Mostafazadeh, S.W. Wong, S. Saichellappa, S. Lenzini, Z. Peng, J.-W. Shin, Deterministic single cell encapsulation in asymmetric microenvironments to direct cell polarity, *Advanced Science*, 10 (2023) 2206014.

4. **P. Gupta**, O. Alheib, J.-W. Shin, Towards single cell encapsulation for precision biology and medicine, *Advanced Drug Delivery Reviews*, (2023) 115010.
5. I.S. Cho, A. Yaghmour, A. Joshi, **P. Gupta**, M.A. Sanborn, M. P. Zappia, S.W. Wong, G. Cheng, M. Frolov, J. Rehman, J.-W. Shin, Innate immune-cloaked microgel-coated mesenchymal stromal cells reverse persistent pulmonary fibrosis via reparative macrophages. *Advanced Materials*, 38(1), p.e04590.

➤ Developing cell-based tissue-engineered grafts using bioresorbable biomaterials

1. **P. Gupta**, M. Kumar, N. Bhardwaj, J.P. Kumar, C.S. Krishnamurthy, S.K. Nandi, B.B. Mandal, Mimicking form and function of native small diameter vascular conduits using mulberry and non-mulberry patterned silk films, *ACS Applied Materials & Interfaces* 8(25) (2016) 15874-15888.
2. **P. Gupta**, K.L. Lorentz, D.G. Haskett, E.M. Cunnane, A.K. Ramaswamy, J.S. Weinbaum, D.A. Vorp, B.B. Mandal, Bioresorbable silk grafts for small diameter vascular tissue engineering applications: In vitro and in vivo functional analysis, *Acta Biomaterialia* 105 (2020) 146-158.
3. **P. Gupta**, M. Adhikary, J.C. M, M. Kumar, N. Bhardwaj, B.B. Mandal, Biomimetic, osteoconductive non-mulberry silk fiber reinforced tricomposite scaffolds for bone tissue engineering, *ACS Applied Materials & Interfaces* 8(45) (2016) 30797-30810.
4. K.L. Lorentz, A.X. Marini, L.A. Bruk, **P. Gupta**, B.B. Mandal, M.V. DiLeo, J.S. Weinbaum, S.R. Little, D.A. Vorp. Mesenchymal stem cell-conditioned media-loaded microparticles enhance acute patency in silk-based vascular grafts. *Bioengineering*. 2024; 11(9):947.
5. **P. Gupta** and B. B. Mandal, Patterned silk film based vascular graft construct and its use thereof. (*Indian Patent granted: 420608*)
6. **P. Gupta**, and B. B. Mandal, Fabrication of small-diameter tubular grafts for vascular tissue engineering applications using mulberry and non-mulberry silk proteins', *Vascular Tissue Engineering: Methods and Protocols* (2022), 125-39. [Book Chapter]
7. P. Bhattacharjee, **P. Gupta**, M. J. Christakiran, S. K. Nandi, and B. B. Mandal, Silk-based matrices for bone tissue engineering applications', in *nanostructures for the engineering of cells, Tissues and Organs* (Elsevier, 2018), pp. 439-72. [Book Chapter]

➤ Developing acellular tissue-engineered grafts improving clinical feasibility

1. **P. Gupta**[#], G.R. Chaudhuri[#], G. Janani, M. Agarwala, D. Ghosh, S.K. Nandi, B.B. Mandal, Functionalized silk vascular grafts with decellularized human Wharton's jelly improves remodeling via immunomodulation in rabbit jugular vein, *Advanced Healthcare Materials* 10(19) (2021) 2100750. ([#] Co-first authors)
2. K.L. Lorentz[#], **P. Gupta**[#], M.S. Shehabeldin, E.M. Cunnane, A.K. Ramaswamy, K. Verdelis, M.V. DiLeo, S.R. Little, J.S. Weinbaum, C.S. Sfeir, B.B. Mandal, D.A. Vorp, CCL2 loaded microparticles promote acute patency in silk-based vascular grafts implanted in rat aortae, *Acta Biomaterialia* 135 (2021) 126-138. ([#] Co-first authors)
3. **P. Gupta**, B.B. Mandal, Silk biomaterials for vascular tissue engineering applications, *Acta Biomaterialia* 134 (2021) 79-106.
4. **P. Gupta**, B.B. Mandal, Tissue-Engineered Vascular Grafts: Emerging Trends and Technologies, *Advanced Functional Materials* 31(33) (2021) 2100027.
5. **P. Gupta**, B.B. Mandal, Bi-layered Porous Silk Vascular Grafts and their Uses Thereof. (*Indian Patent granted: 537706*).

➤ Other Collaborative research outcomes

During my research career, I was actively involved with research collaborations with IIT Guwahati, Tezpur University, IIT Patna, LV Prasad Eye Institute, Tomas Bata University and University of Pittsburgh.

1. M. Kumar, **P. Gupta**, S. Bhattacharjee, S. K. Nandi and B. B. Mandal, Immunomodulatory injectable silk hydrogels maintaining functional islets and promoting anti-inflammatory M2 macrophage polarization. *Biomaterials*. 2018; 187:1-17.
2. R. Konwarh, **P. Gupta** and B. B. Mandal, Silk-microfluidics for advanced biotechnological applications: A progressive review. *Biotechnology Advances*. 2016; 34:845-58.
3. C. Ramachandran, **P. Gupta**, S. Hazra and B. B. Mandal. In vitro culture of human corneal endothelium on silk fibroin films for tissue regeneration, *Translational Vision Science & Technology*. 2020; 9(4): 12-12.
4. N. Saha, R. Shah, **P. Gupta**, B. B. Mandal, R. Alexandrova, M. D. Sikiric and P. Saha, PVP-CMC hydrogel: An excellent bioinspired and biocompatible scaffold for osseointegration. *Materials Science and Engineering: C*. 2019; 95: 440-9.
5. E. M. Cunnane, K. L. Lorentz, A. K. Ramaswamy, **P. Gupta**, B. B. Mandal, F. J. O'Brien, J. S. Weinbaum, and D. A. Vorp, Extracellular vesicles enhance the remodeling of cell-free silk vascular scaffolds in rat aortae. *ACS Applied Materials & Interfaces*. 2020; 12(24): 26955-26965.
6. S. Bhowmick, A. Jana, S. R. Marri, **P. Gupta**, J.N. Behera, B. B. Mandal and N. Das, Pyrazine based Pt (II) bis-alkynyl organometallic complexes: Synthesis, characterization, and cytotoxic effect on A549 human lung carcinoma cells. *Applied Organometallic Chemistry*. 2017; 31:e3824.

7. S. Bhowmick, A. Jana, K. Singh, **P. Gupta**, A. Gangrade, B. B. Mandal and N. Das, Coordination-driven self-assembly of ionic irregular hexagonal metallamacrocycles via an organometallic clip and their cytotoxicity potency. *Inorganic Chemistry*. 2017; 57:3615-25.
8. R. Duarah, Y. P. Singh, **P. Gupta**, B. B. Mandal and N. Karak, Smart self-tightening surgical suture from a tough bio-based hyperbranched polyurethane/reduced carbon dot nanocomposite. *Biomedical Materials*. 2018;13:045004.
9. R. Duarah, Y. P. Singh, **P. Gupta**, B. B. Mandal and N. Karak, High performance bio-based hyperbranched polyurethane/carbon dot-silver nanocomposite: a rapid self-expandable stent. *Biofabrication*. 2016;8:045013.
10. M. Kumar, D. Jain, N. Bhardwaj, **P. Gupta**, S. K. Nandi, B. B. Mandal, Native honeybee silk membrane: a potential matrix for tissue engineering and regenerative medicine. *RSC Advances*. 2016;6:54394-403.

Conference Publications

1. A. Singh, P. Yadav, S. Das, **P. Gupta**, A. Bhattacharyya, M. Maishan, H. Taenaka, K. Bachmaier, J.-W. Shin, M. Matthey, Nanoparticle mediated modulation of macrophage-fibroblast axis as therapeutics against pulmonary fibrosis, *The Journal of Immunology* 212(1_Supplement) (2024) 0714_6561-0714_6561.
2. K. L. Lorentz, A. Marini, L. Bruk, **P. Gupta**, B. B. Mandal, M. Dileo, J. Weinbaum, and D. Vorp, 'Seeded Microparticles Containing ASC Conditioned Media Enhance Acute Patency in Silk-Based Vascular Grafts', *Tissue Engineering Part A*, 28 (2022), 349-50.
3. S.-W. Wong, **P. Gupta**, I. S. Cho, and J.-W. Shin, 'Mechanotransduction of Matrix Remodeling-Directed Lineage Specification', in *APS March Meeting Abstracts* (2022), p. Q07. 010.
4. **P. Gupta**, K. L. Lorentz, D. G. Haskett, E. M. Cunnane, A. K. Ramaswamy, J. S. Weinbaum, D. A. Vorp, B. B. Mandal. Functional analysis of tubular bi-layered silk scaffolds in a rat aortic model for vascular tissue engineering applications. *The International Journal of Artificial Organs*, Volume 42 Issue 1_suppl, September 2019, pp. 1–26.
5. **P. Gupta**, B. B. Mandal. Surface Topography of silk films influences the functional behaviour of vascular cells. *Tissue Engineering Part A: Mary Ann Liebert, INC 140 Huguenot street, 3rd fl, New Rochelle, NY 10801 USA*; 2017. p. S57-S.
6. J. C. Moses, **P. Gupta**, B. B. Mandal. Osteoinductive and proangiogenic bioactive glass silk composite scaffolds towards resorbable and vascularized bone grafts. *Tissue Engineering Part A: Mary Ann Liebert, INC 140 Huguenot street, 3rd fl, New Rochelle, NY 10801 USA*; 2017. p. S89-S.
7. **P. Gupta**, M. Kumar, N. Bhardwaj, J. P. Kumar, C. S. Krishnamurthy, S. K. Nandi and B. B. Mandal. Bioengineered silk vascular grafts for coronary artery bypass surgery. *European cells & materials*, 2016; 31:231.
8. M. Adhikary, **P. Gupta**, M. Kumar, S. Jasmine, N. Bhardwaj, D. Chouhan and B. B. Mandal. Hydroxyapatite-silk fiber-silk fibroin tri-composite scaffolds for bone tissue engineering. *European cells & materials*, 2016; 31:18.

Selected Conference, Seminar, Workshop Participation/Presentations

1. **P. Gupta**, K. Debnath, A. Joshi, A. Yaghmour, C. Yang, N. Taher, G. Chung, K. Pajcini, J.-W. Shin, Tailoring extracellular vesicles with Notch ligands to treat vascular injuries. *Gordon Research Conference/Seminar on Extracellular Vesicles* held 27/07/2024- 02/08/2024 at Grand Summit Hotel at Sunday River, Maine, United States. (Oral Presentation)
2. **P. Gupta**, K. Debnath, A. Joshi, A. Yaghmour, C. Yang, N. Taher, G. Chung, K. Pajcini, J.-W. Shin, Shear-sensitive notch activation via extracellular vesicles to treat vascular injuries. *International Cell Culture Under Flow Meeting 2024*, July 24–25. Northwestern University, Chicago, IL, USA (Oral Presentation)
3. **P. Gupta**, K. Debnath, G. Chung, J.-W. Shin, Engineering extracellular vesicles for functional ligand presentation over distance to treat tissue injury. *ISEV 2023 Annual Meeting*, 17-21 May 2023, Seattle, Washington, USA (Featured abstract presentation)
4. **P. Gupta**, S.-W. Wong, I. S. Cho, J.-W. Shin, Precision biomanufacturing of single cell niches with tunable viscoelastic properties to direct the fate of stem cells. *ABioM SIG Meeting*, March 22-24, 2023, Hyattsville, MD, USA (Junior Investigator Award)
5. **P. Gupta**, S.-W. Wong, J.-W. Shin, Modulating the response time of cells to substrate stress relaxation by controlled gel deposition around single cells. *Gordon Research Conference on Signal Transduction by Engineered Extracellular Matrices* held 24/07/2022- 29/07/2022 at Southern New Hampshire University in Manchester, New Hampshire, USA.
6. **P. Gupta**, G. R. Chaudhuri, G. Janani, M. Agarwala, D. Ghosh, S. K. Nandi, B. B. Mandal, Decellularized human Wharton's jelly facilitates remodeling of cell-free silk vascular grafts in rabbit jugular vein via immunomodulation. *Cardiovascular Metabolic Week (CVMW2020)*. Organized by The International Society for Applied Cardiovascular Biology in Tokyo, Japan; March 12-13, 2021. (Virtual Oral Presentation)
7. **P. Gupta**, G. R. Chaudhuri, G. Janani, M. Agarwala, D. Ghosh, S.K. Nandi, B. B. Mandal. Human Wharton's Jelly-Silk Composite Grafts for Small-Diameter Vascular Tissue Engineering Applications. *International Conference on Biomedical Materials Innovation-2020 (ICBMI-2020)*, virtual conference organized by Bharathiar University, India ; Dec 6-9, 2020. (Virtual Oral Presentation)
8. **P. Gupta**, K. L. Lorentz, D. G. Haskett, E. M. Cunnane, A. Ramaswamy, J. S. Weinbaum, D. A. Vorp, B. B. Mandal. Functional analysis of tubular bi-layered silk scaffolds in rat aortic model for vascular tissue engineering applications.

Combined symposium of The International Society for Applied Cardiovascular Biology and International Society of Vascular Tissue Engineering (ISACB + ISVTE 2019), University of Zurich, Zurich, Switzerland; June 19-21, 2019. (3 minute lightening talk and Poster presentation)

9. **P. Gupta**, K. L. Lorentz, D. G. Haskett, E. M. Cunnane, A. Ramaswamy, J. S. Weinbaum, D. A. Vorp, B. B. Mandal. Functional in vivo performance of adipose stem cells seeded small diameter silk vascular grafts. *Research Conclave 2019*, IIT Guwahati, India; March 14-17, 2019. (1st prize in poster presentation)
 10. **P. Gupta**, K. L. Lorentz, D. G. Haskett, E. M. Cunnane, A. Ramaswamy, J. S. Weinbaum, D. A. Vorp, B. B. Mandal. In vitro and in vivo evaluation of bi-layered tubular silk scaffolds for vascular tissue engineering applications. *ICFNM-2019*, IIT BHU, Varanasi, India; February 22-25, 2019. (1st prize in oral presentation)
 11. **P. Gupta**, K. L. Lorentz, D. G. Haskett, E. M. Cunnane, J. S. Weinbaum, D. A. Vorp and B. B. Mandal. Bi-layered tubular silk scaffolds for vascular tissue engineering applications. *Sixteenth annual Richard L. Simmon lecture in surgical science and department*, University of Pittsburgh, PA, USA; May 2, 2018. (Poster Presentation)
 12. **P. Gupta** and B. B. Mandal. Surface topography of silk films influence the functional behavior of vascular cells. *TERMIS–Americas*, Charlotte, NC, USA; December 3-6, 2017. (Poster Presentation)
 13. **P. Gupta**, M. Kumar, N. Bhardwaj, J. P. Kumar, C. S. Krishnamurthy, S. K. Nandi and B. B. Mandal, Mimicking form and function of native small diameter vascular conduits using mulberry and non-mulberry patterned silk films. *Research Conclave 2017*, IIT Guwahati, India (Poster presentation, Best Poster Award both at Department and Institute level)
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Membership of academic professional societies

1. Member of '*American Heart Association (AHA)*' since Sep 2022 onwards.
 2. Member of '*International Society for Extracellular Vesicles*' since Jan 2023 onwards.
 3. Life member of '*The Indian Science Congress Association*' since 2015 onwards.
 4. Life member of '*Society for Tissue Engineering & Regenerative Medicine (India)*' since 2019 onwards.
 5. Life member of '*Society for Biomaterials and Artificial organs (India)*' since 2019 onwards.
 6. Member of '*International Society for Applied Cardiovascular Biology (ISACB)*' since Jan 2020 onwards.
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Student Mentoring Experience

During PhD and postdoctoral tenure, I got an opportunity to mentor the following students:

1. Prateek Hemani (IITG Undergraduate), Thesis: Silk fiber assisted vascularization of 3D tissue engineered matrices (2015-16)
 2. Mimi Adhikari (IITG Masters), Thesis: Composite Silk Scaffolds for Bone and Cartilage Tissue Engineering (2015-16)
 3. Waseem Ahmad Bhat (IITG Undergraduate), Thesis: Vascular network fabrication in 3D-grafts via silk fibers assembly (2016-17)
 4. Sai Chand Behara (IITG Undergraduate), Thesis: Agarose laminated silk films as potential candidate for sustained drug release (2016-17)
 5. Sakshi Gupta (Banasthali Vidyapith Undergraduate), Thesis: Exploring the potential of silk-decellularized porcine aorta composite matrices for vascular tissue engineering applications (2018)
 6. Vaishali Soni (Banasthali Vidyapith Undergraduate), Thesis: Composite Silk Scaffolds for Vascular Tissue Engineering Applications (2019)
 7. Kait Zemanski (PhD Rotation student at UIC), Thesis: Microgel based ligand presentation to cells (2022)
 8. Claire Yang (Carnegie Fellow at UIC from Texas A&M University, Undergraduate), Thesis: Studying the interaction between Notch ligand functionalized extracellular vesicles and endothelial cells (2023)
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