

BIOGRAPHICAL SKETCH (last updated; December/26/2024)

NAME Lim, Ki-Taek ktlim@kangwon.ac.kr; ktlim74@gmail.com	POSITION TITLE Professor Dept. of Biosystems Engineering Kangwon National University Biorobotics group (www.bioroboticseng.com) Founder, Biomechagen, Co., Ltd.
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EDUCATION

INSTITUTION AND LOCATION	DEGREE (in Engr.)	MM/YY	FIELD OF STUDY
University of Arkansas Institute for Nanoscience and Engineering	Postdoc	02/15	Bio/Nanotechnologies
Seoul National University Dental Research Institute	Postdoc	02/14	Tooth Tissue Engineering
Seoul National University CALS	Ph.D.	02/13	Biosystems Engineering
Sungkyunkwan University	M.S.	02/99	Biomechatronics Engineering
Konkuk University	B.S.	02/97	Agriculture Machinery Engineering

Author ID

ORCID	0000-0003-2091-788X
Scopus	26029923900

<https://topresearcherslist.com/Home/Profile/920192>

A. Personal Statement

I have studied mechanical engineering, mechatronics, and biological engineering, ultimately aiming for bio-convergence of research findings into biosystems science & engineering. Based on bio-convergence toolkits, I have published +220 research articles related to tissue engineering and regenerative medicine, stem cells, and bio/nanotechnologies. The research roadmap is developing a bio-nanorobotic system for future applications with the background of novel bioreactors, non-invasive measurement systems, stem cell culture engineering, and bio/nano-technologies. The proposed research aims to elucidate novel techniques in applications of next-tissue regeneration based on emerging convergence biotechnologies.

B. Positions and Honors

Positions and Employment

2020-	Associate Professor, Department of Biosystems Engineering, Kangwon National University
2015-	Assistant Professor, Department of Biosystems Engineering, Kangwon National University
2015-	Visiting Scholar, Research Institute for Agriculture and Life Sciences, Seoul National University
2014-2015	Postdoctoral Fellow, Dept. of Biological and Agriculture Engineering, Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, USA (Prof. Jin-Woo Kim)
2013-2014	Senior Researcher, Tooth-Bioengineering Group, Dental Research Institute, Seoul National University (Prof. Phill-Hoon Choung)

Other Experience and Professional Memberships

2025-	Editorial Board Member, Regenerative Medicine Reports https://journals.lww.com/rmr
2025-	Editorial Board Member, Organoid Research https://accscience.com/journal/OR
2024-	Editorial Board Member, International Journal of Bioprinting https://accscience.com/journal/IJB
2024	Elected by Stanford University, representing the top 2% of the most-cited scientists with a single-year impact in (1) Biomedical Engineering, (2) Nanoscience & Nanotechnology, (3) Engineering disciplines

2023	Elected by Stanford University, representing the top 2% of the most-cited scientists with a single-year impact in (1) Biomedical Engineering, (2) Nanoscience & Nanotechnology, (3) Engineering disciplines
2022-2023	Special Editor, International Journal of Bioprinting, IF 7.422
2020-2022	Committee Member, Korea Biomaterials Society
2020-2022	Committee Member, Korea Tissue Engineering & Regenerative Medicine Society
2018-2020	Committee Member, Korea Organoid Society
2018-2020	Committee Member, International Conference on Bioresources, Energy, Environment, and Materials Technology
2017-2022	Committee Member, Institutional Animal Care and Use Committee, KNU.
2017-2019	Editorial Board, Advances in Biomaterials Research (ABR)
2015	Committee Member, The delegation of the 12 th US-Korea Nano Forum
2015	Committee Member, Korea National Industrial Convergence Center
2015	Committee Member, Korea Institute of Planning & Evaluation for Tech. in Food, Agriculture, Forestry & Fisheries
2015-2016	Editorial Board, Journal of Biosystems Engineering
2015-2016	Technical Program Committee Member, IEEE NANOMED
2015-2018	Associate Editor, Engineering in Agriculture, Environment and Food Journal (Elsevier)
2010-2014	Instructor, Seoul National University; Konkuk University

C. Selected Peer-reviewed Publications (Selected from 200 peer-reviewed publications)

Most relevant to the current publications (10)

1. Bioinspired shape reconfigurable, printable, and conductive 'E-skin' patch with robust antibacterial properties for human health sensing
Hojin Kim; Sayan Deb Dutta; Myoung Joon Jeon; Hyeonsoo Park; Jieun Lee; Youjin Seol; Tejal V. Patil; Aayushi Randhawa; Rumi Acharya; Keya Ganguly; Ki-Taek Lim*
Advanced Functional Materials 2025
IF 19.70 JCR 5% | JCI 5% | <https://doi.org/10.1002/adfm.202504088>
2. Transcriptomic profiling of human mesenchymal stem cells using a pulsed electromagnetic-wave motion bioreactor system for enhanced osteogenic commitment and therapeutic potentials
Aayushi Randhawa; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Ki-Taek Lim*
Biomaterials 2025 Volume 312, January 2025, 122713 IF 12.8 JCR 3% | JCI 2%
<https://doi.org/10.1016/j.biomaterials.2024.122713>
3. Tailoring osteoimmunity and hemostasis by 3D-printed nano-photocatalytic bactericidal scaffold for augmented bone regeneration
Sayan Deb Dutta; Jin Hexiu; Md Moniruzzaman; Tejal V. Patil; Rumi Acharya; Jong Sung Kim; Ki-Taek Lim*
Biomaterials 2025 Volume 316, May 2025, 122991 IF 12.8 JCR 3% | JCI 2%
<https://doi.org/10.1016/j.biomaterials.2024.122991>
4. 3D bioprinting of engineered exosomes secreted from M2-polarized macrophages through immunomodulatory biomaterial promotes in vivo wound healing and angiogenesis
Sayan Deb Dutta; Jeong Man An; Jin Hexiu; Aayushi Randhawa; Keya Ganguly; Tejal V. Patil; Thavasyappan Thambi; Jangho Kim; Yong-kyu Lee; Ki-Taek Lim*
Bioactive Materials 2025 Volume 45, March, Pages 345-362 | IF 18.90 JCR 1% | JCI 1% |
<https://doi.org/10.1016/j.bioactmat.2024.11.026>
5. Zn@TA assisted dual cross-linked 3D printable glycol grafted chitosan hydrogels for robust antibiofilm and wound healing
Tejal V. Patil; Hexiu Jin; Sayan Deb Dutta; Rumi Acharya; Kehan Chen; Keya Ganguly; Aayushi Randhawa; Ki-Taek Lim*
Carbohydrate Polymers 2024 Volume 344, 15 November, 122522 IF 10.70 JCR 1% | JCI 1%
<https://doi.org/10.1016/j.carbpol.2024.122522>
6. Electrically stimulated 3D bioprinting of gelatin-polypyrrole hydrogel with dynamic semi-IPN network induces osteogenesis via collective signaling and immunopolarization
Sayan Deb Dutta; Keya Ganguly; Aayushi Randhawa; Tejal V. Patil; Dinesh K. Patel; Ki-Taek Lim*
Biomaterials 2023 Mar;294:121999 IF 15.304 JCR 5% JCI 1%
<https://doi.org/10.1016/j.biomaterials.2023.121999>
7. Trackable and highly fluorescent nanocellulose-based printable bio-resins for image-guided tissue regeneration
Sayan Deb Dutta; Tejal V Patil; Keya Ganguly; Rumi Acharya; Md Moniruzzaman; Ki-Taek Lim*
Carbohydrate Polymers 2023 Volume 320, 15 November 121232 IF 11.20 | JCR 3% | JCI %
<https://doi.org/10.1016/j.carbpol.2023.121232>
8. Nanocellulose-assisted 3D-printable, transparent, bio-adhesive, conductive, and biocompatible hydrogels as sensors and moist electric generators
Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Ki-Taek Lim*
Carbohydrate Polymers 2023 Volume 315, 1 September 2023, 120963 IF 11.20 | JCR 3% | JCI %
<https://doi.org/10.1016/j.carbpol.2023.120963>
9. Transcriptomic changes towards osteogenic differentiation of mesenchymal stem cells on 3D printed GelMA/CNC hydrogel under pulsatile pressure environment
Keya Ganguly; Sayan Deb Dutta; Aayushi Randhawa; Dinesh K Patel; Tejal V Patil; Ki-Taek Lim*
Advanced Healthcare Materials 2023 April 26; 12(11) 2202163 IF 11.092 JCR 8%
<https://doi.org/10.1002/adhm.202202163> Science News
10. Cellulose nanocrystals vs. cellulose nanosphere: A comparative study on cytotoxicity and macrophage polarization potential
Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Ki-Taek Lim*
Carbohydrate Polymers 2023 303 1 120435 IF 10.723 JCR 3% | JCI 1%
<https://doi.org/10.1016/j.carbpol.2022.120464>

Publications (Include both current and previous affiliations)

1. Ultra-thin, stimuli-responsive, antimicrobial, self-cleaning, reusable, and biodegradable, micro/nanofibrous electrospun mat as an efficient face mask filter for airborne disease prevention
Ganguly, Keya; Randhawa, Aayushi; Dutta, Sayan; Park, Hyeonseo; Mohammad Hossein Pour, Mehran; Kim, Hojin; Acharya, Rumi; Patil, Tejal; Shin, Beom-Soo; Kim, Dae Hyun; Ki-Taek Lim*
Nano Letters 2025
IF 09.60 JCR 10% | JCI 9%
2. Nanodiamond: a multifaceted exploration of electrospun nanofibers for antibacterial and wound healing applications
Hyeonseo Park; Tejal V. Patil; Ki-Taek Lim*
Journal of Nanobiotechnology 2025
IF 10.70 JCR 5% | JCI 5%
09 April 2025 23:285
<https://doi.org/10.1186/s12951-025-03351-9>
3. Bioinspired shape reconfigurable, printable, and conductive 'E-skin' patch with robust antibacterial properties for human health sensing
Hojin Kim; Sayan Deb Dutta; Myoung Joon Jeon; Hyeonseo Park; Jieun Lee; Youjin Seol; Tejal V. Patil; Aayushi Randhawa; Rumi Acharya; Keya Ganguly; Ki-Taek Lim*
Advanced Functional Materials 2025
IF 19.70 JCR 5% | JCI 5%
<https://doi.org/10.1002/adfm.202504088>
4. Zinc oxide@tetracycline spiky microparticles design for persistent antibacterial therapy
Youjin Seol; Keya Ganguly; Tejal V. Patil; Sayan Deb Dutta; Aayushi Randhawa; Hojin Kim; Rumi Acharya; Ki-Taek Lim*
Journal of Biomedical Materials Research Part A 2025
IF 03.90 | JCR 30% | JCI 50%
5. Physical stimuli-responsive 3D printable hydrogels for scalable manufacturing of bioengineered meat analogs
Jieun Lee; Sayan Deb Dutta; Seong-Jun Cho; Ki-Taek Lim*
Trends in Food Science & Technology 2025
Available online 4 January 2025, 104867
IF 15.1 JCR 1% | JCI 1% |
<https://doi.org/10.1016/j.tifs.2025.104867>
6. Physical stimuli-responsive DNA hydrogels: design, fabrication strategies, and biomedical applications
Rumi Acharya; Sayan Deb Dutta; Hemadri Malik; Keya Ganguly; Tejal V. Patil; Aayushi Randhawa; Ki-Taek Lim*
Journal of Nanobiotechnology 2025
22 March 2025 23:233
IF 10.60 JCR 4% | JCI 6%
<https://doi.org/10.1186/s12951-025-03237-w>
7. NIR-activated catechol-functionalized nanodiamond nanofibers for accelerating on-demand MRSA and E. coli biofilm eradication
Hyeonseo Park; Tejal V. Patil; Jieun Lee; Hojin Kim; Seong-Jun Cho; Ki-Taek Lim*
Journal of Biological Engineering 2025
IF 05.70 JCR 7% | JCI 10%
<https://doi.org/10.1186/s13036-024-00469-6>
8. 3D bioprinting of engineered exosomes secreted from M2-polarized macrophages through immunomodulatory biomaterial promotes in vivo wound healing and angiogenesis
Sayan Deb Dutta; Jeong Man An; Jin Hexiu; Aayushi Randhawa; Keya Ganguly; Tejal V. Patil; Thavasyappan Thambi; Jangho Kim; Yong-kyu Lee; Ki-Taek Lim*
Bioactive Materials 2025 Volume 45, March, Pages 345-362 | IF 18.90 JCR 1% | JCI 1% |
<https://doi.org/10.1016/j.bioactmat.2024.11.026>
9. In vitro osteogenic response to copper-doped eggshell derived hydroxyapatite with macrophage supplements
Tejal V. Patil; Dinesh K. Patel; Ki-Taek Lim*
Journal of Biomedical Materials Research Part A 2025 Volume 113, Issue 1 January IF 03.90 | JCR 30% | JCI 50%
<https://doi.org/10.1002/jbm.a.37838>
10. Tailoring osteoimmunity and hemostasis by 3D-printed nano-photocatalytic bactericidal scaffold for augmented bone regeneration
Sayan Deb Dutta; Jin Hexiu; Md Moniruzzaman; Tejal V. Patil; Rumi Acharya; Jong Sung Kim; Ki-Taek Lim*
Biomaterials 2025 Volume 316, May 2025, 122991 IF 12.8 JCR 3% | JCI 2%
<https://doi.org/10.1016/j.biomaterials.2024.122991>

11. Transcriptomic profiling of human mesenchymal stem cells using a pulsed electromagnetic-wave motion bioreactor system for enhanced osteogenic commitment and therapeutic potentials
Aayushi Randhawa; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim*](#)
Biomaterials 2025 Volume 312, January 2025, 122713 IF 12.8 JCR 3% | JCI 2%
<https://doi.org/10.1016/j.biomaterials.2024.122713>
12. Electroconductive nanocellulose, a versatile hydrogel platform: from fabrication to biomedical engineering applications
Myungjoon Cheon; Aayushi Randhawa; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Rumi Acharya; Hojin Kim; Jieun Lee; Hyeonseon Park; Youjin Seol; [Ki-Taek Lim*](#)
Advanced Healthcare Materials 2025 IF 10.00 JCR 10% | JCI 10%
<https://doi.org/10.1002/adhm.202403983>
13. Zn@TA assisted dual cross-linked 3D printable glycol grafted chitosan hydrogels for robust antibiofilm and wound healing
Tejal V. Patil; Hexiu Jin; Sayan Deb Dutta; Rumi Acharya; Kehan Chen; Keya Ganguly; Aayushi Randhawa; [Ki-Taek Lim*](#)
Carbohydrate Polymers 2024 IF 10.70 JCR 1% | JCI 1%
<https://doi.org/10.1016/j.carbpol.2024.122522>
14. Stimuli-triggered pollen inspired micro-/nanorobots for advanced therapeutics
Youjin Seol; Keya Ganguly; Tejal V. Patil; Sayan Deb Dutta; Aayushi Randhawa; Hojin Kim; Rumi Acharya; [Ki-Taek Lim*](#)
Nano Today 2024 Volume 57, August, 102337 IF 17.30 JCR 5% | JCI 5%
<https://doi.org/10.1016/j.nantod.2024.102337>
15. Sunflower pollen-morphology mimicked spiky zinc nanomotors as a photosensitizer for killing bacteria and cancer cells
Sayan Deb Dutta; Rachmi Luthfikasari; Tejal V. Patil; Keya Ganguly; Youjin Seol; Aayushi Randhawa; [Ki-Taek Lim*](#)
ACS Applied Bio Materials 2024 IF 04.70 JCR 25% | JCI 25%
<https://doi.org/10.1021/acsabm.4c00092>
16. NIR-responsive carbon dots as an oxidative-stress amplifier and hyperthermia-induced superior photothermal in-vitro anticancer activity
Md Moniruzzaman; Sayan Deb Dutta; [Ki-Taek Lim*](#); Jongsung Kim*
Colloids and Surfaces A: Physicochemical and Engineering Aspects 2024 IF 05.20 | JCR 25% | JCI 25%
<https://doi.org/10.1016/j.colsurfa.2024.134266>
17. Stimuli-mediated macrophage switching: unraveling the dynamics at nanoplateforms-macrophage interface
Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Aayushi Randhawa; Rumi Acharya; [Ki-Taek Lim*](#)
Advanced Healthcare Materials 2024 IF 10.00 JCR 10% | JCI 10%
<https://doi.org/10.1002/adhm.202400581>
18. Unzipped carbon nanotubes assisted 3D printable functionalized chitosan hydrogels for strain sensing applications
Dinesh K. Patel; So-Yeon Won; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim*](#); Sung Soo Han*
International Journal of Biological Macromolecules 2024 Volume 265, Part 2, 131025 IF 08.20 | JCR 5% | JCI 5%
<https://doi.org/10.1016/j.ijbiomac.2024.131025>
19. PAI-1 transfected-conditioned media promotes osteogenic differentiation of hBMSCs
Zhang Li; Hou Kegui; Wang Piao; Wang Xuejiu; [Ki-Taek Lim*](#); Hexiu Jin*
Cell Biology International 2024 IF 3.90 | JCI 25%
<https://doi.org/10.1002/cbin.12166>
20. Single-walled carbon nanotube-based optical nano/biosensors for biomedical applications: role in bioimaging, disease diagnosis, and biomarkers detection
Rumi Acharya; Sayan Deb Dutta; Keya Ganguly; Tejal V. Patil; Aayushi Randhawa; [Ki-Taek Lim*](#)
Advanced Materials Technologies 2024 IF 06.80 JCR 25% | JCI 25%
<https://doi.org/10.1002/admt.202400279>
21. Recent advances in biomedical application of 3D printed Nanocellulose-based adhesive hydrogels: A review
Hojin Kim; Sayan Deb Dutta; Aayushi Randhawa; Tejal V. Patil; Keya Ganguly; Rumi Acharya; Jieun Lee; [Ki-Taek Lim*](#)
International Journal of Biological Macromolecules 2024 IF 08.20 | JCR 5% | JCI 5%
<https://doi.org/10.1016/j.ijbiomac.2024.130732>
22. Assessment of the biocompatibility and bioimaging potential of fluorescent carbon dots derived from waste biomass
Dinesh K. Patel; Eunseo Jung; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim*](#); Sung Soo Han*
Materials Letters 2024 IF 3.00
<https://doi.org/10.1016/j.matlet.2024.136152>
23. Manufacturing 3D biomimetic tissue: a strategy involving the integration of electrospun nanofibers with a 3D printed framework for enhanced tissue regeneration
Aayushi Randhawa; Sayan Deb Dutta; Keya Ganguly; Tejal V. Patil; [Ki-Taek Lim*](#)
Small 2024 IF 13.30 JCR 5% | JCI 5%

<https://doi.org/10.1002/sml.2023092694>

24. 3D printable hydrogel bioelectronic interfaces for healthcare monitoring and diagnosis: materials, design strategies, and applications
Sayan Deb Dutta; Keya Ganguly; Tejal V. Patil; Aayushi Randhawa; Hojin Kim; Rumi Acharya; [Ki-Taek Lim*](#)
Advanced Materials Technologies 2024 IF 06.80 JCR 25% | JCI 25%
<https://doi.org/10.1002/admt.202301874>
25. Extracellular matrix-bioinspired anisotropic topographical cues of electrospun nanofibers: a strategy of wound healing through macrophage polarization
Hyeonseo Park; Tejal V. Patil; Sayan Deb Dutta; Jieun Lee; Keya Ganguly; Aayushi Randhawa; Hojin Kim; [Ki-Taek Lim*](#)
Advanced Healthcare Materials 2024 IF 10.00 JCR 10% | JCI 10%
<https://doi.org/10.1002/adhm.202304114>
26. Stimuli-responsive 3D printable conductive hydrogel: a step towards regulating macrophage polarization and wound healing
Jieun Lee; Sayan Deb Dutta; Rumi Acharya; Hyeonseo Park; Hojin Kim; Aayushi Randhawa; Tejal V. Patil; Keya Ganguly; Rachmi Luthfikasari; [Ki-Taek Lim*](#)
Advanced Healthcare Materials 2023 2302394 2023 November IF 10.00 JCR 8% | JCI 10%
<https://doi.org/10.1002/adhm.202302394>
27. Polyphenolic carbon quantum dots with intrinsic ROS amplification for melanoma-specific chemodynamic therapy
Sayan Deb Dutta; Md Moniruzzaman; Jin Hexiu; Sourav Sarkar; Keya Ganguly; Dinesh K. Patel; Jagannath Mondal; Yong-Kyu Lee; Rumi Acharya; Jongsung Kim*; [Ki-Taek Lim*](#)
ACS Applied Materials & Interfaces 2023 15(45): 52083–52099 October IF 9.50 JCR 15% | JCI 13%
<https://doi.org/10.1021/acsami.3c07547>
28. Trackable and highly fluorescent nanocellulose-based printable bio-resins for image-guided tissue regeneration
Sayan Deb Dutta; Tejal V Patil; Keya Ganguly; Rumi Acharya; Md Moniruzzaman; [Ki-Taek Lim*](#)
Carbohydrate Polymers 2023 Volume 320, 15 November 121232 IF 11.20 | JCR 3% | JCI %
<https://doi.org/10.1016/j.carbpol.2023.121232>
29. Unraveling the potential of 3D bioprinted immunomodulatory materials for regulating macrophage polarization: state-of-the-art in bone and associated tissue regeneration
Sayan Deb Dutta; Tejal V Patil; Keya Ganguly; Aayushi Randhawa; [Ki-Taek Lim*](#)
Bioactive Materials 2023 Volume 28, October 2023, Pages 284-310 IF 18.90 JCR 2%
<https://doi.org/10.1016/j.bioactmat.2023.05.014>
30. Nanocellulose-assisted 3D-printable, transparent, bio-adhesive, conductive, and biocompatible hydrogels as sensors and moist electric generators
Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim*](#)
Carbohydrate Polymers 2023 Volume 315, 1 September 2023, 120963 IF 11.20 | JCR 3% | JCI %
<https://doi.org/10.1016/j.carbpol.2023.120963>
31. A 3D-bioprinted nanoengineered hydrogel with photo-activated drug delivery for tumor apoptosis and simultaneous bone regeneration via dynamic macrophage immunomodulation
Sayan Deb Dutta; Keya Ganguly; Jin Hexiu; Aayushi Randhawa; Md Moniruzzaman; [Ki-Taek Lim*](#)
Macromolecular Bioscience 2023 23 April 2300096 IF 5.922 JCR 12%
<https://doi.org/10.1002/mabi.202300096>
32. Electrically stimulated 3D bioprinting of gelatin-polypyrrole hydrogel with dynamic semi-IPN network promotes bone regeneration through activating NOTCH/MAPK/SMAD signaling and immunopolarization
Sayan Deb Dutta; Keya Ganguly; Dinesh K. Patel; Tejal V. Patil; [Ki-Taek Lim*](#)
Biomaterials 2023 Mar;294:121999 IF 15.304 JCR 5% | JCI 1%
<https://doi.org/10.1016/j.biomaterials.2023.121999>
33. Transcriptomic changes towards osteogenic differentiation of mesenchymal stem cells on 3D printed GelMA/CNC hydrogel under pulsatile pressure environment
Keya Ganguly; Sayan Deb Dutta; Aayushi Randhawa; Dinesh K Patel; Tejal V Patil; [Ki-Taek Lim*](#)
Advanced Healthcare Materials 2023 April 26; 12(11) 2202163 IF 11.092 JCR 8%
<https://doi.org/10.1002/adhm.202202163> [Science News](#)
34. Cellulose nanocrystals vs. cellulose nanosphere: A comparative study on cytotoxicity and macrophage polarization potential
Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim*](#)
Carbohydrate Polymers 2023 303 1 120435 IF 10.723 JCR 3% | JCI 1%
<https://doi.org/10.1016/j.carbpol.2022.120464>
35. Electrospinning near infra-red light-responsive unzipped CNT/PDA nanofibrous membrane for enhanced antibacterial effect and rapid drug release
Tejal V. Patil; Sayan Deb Dutta; Dinesh K. Patel; Keya Ganguly; [Ki-Taek Lim*](#)

- Applied Surface Science** 2023 612(1): 155949 IF 7.392 JCR 3% | JCI 3%
<https://doi.org/10.1016/j.apsusc.2022.155949>
36. Highly stretchable, adhesive, and biocompatible hydrogel platforms of tannic acid functionalized spherical nanocellulose for strain sensors
 Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Aayushi Randhawa; Ki-Taek Lim*
International Journal of Biological Macromolecules 2023 229 28 105-122 IF 8.025 JCR 7% | JCI 9%
<https://doi.org/10.1016/j.ijbiomac.2022.12.286>
 37. Recent advances in 3D printing of photocurable polymers: types, mechanism, and tissue engineering application
 Aayushi Randhawa; Sayan Deb Dutta; Keya Ganguly; Dinesh K. Patel; Tejal V. Patil; Ki-Taek Lim*
Macromolecular bioscience 2023 Jan;23(1):e2200278 IF 5.859 JCR 12%
<https://doi.org/10.1002/mabi.202200278>
 38. Multifunctional 3D platforms for rapid hemostasis and wound healing: structural and functional prospects at biointerfaces
 Keya Ganguly; Mercedes Espinal; Sayan Deb Dutta; Dinesh K. Patel; Tejal V. Patil; Ki-Taek Lim*
International Journal of Bioprinting 2023 9(1): 648 | IF 8.40 | Special issue as a guest editor
<http://dx.doi.org/10.18063/ijb.v9i1.648>
 39. Size-wise effect of agricultural by-product-derived calcium phosphate composites on stem cell osteogenesis
 Kyoung-Je Jang; Sangbae Park; Juo Lee; Yeonggeol Hong; Hoon Seonwoo; Ki-Taek Lim; Jangho Kim; Jong Hoon Chung
Journal of Biosystems Engineering 2023 October, Scopus indexed
<https://link.springer.com/article/10.1007/s42853-023-00199-5>
 40. A review on electroactive polymer-metal composites: development and applications for tissue regeneration
 Rumi Acharya; Sayan Deb Dutta; Tejal V. Patil; Keya Ganguly; Aayushi Randhawa; Ki-Taek Lim*
Journal of Functional Biomaterials 2023 14(10): 523 IF 4.80 | Invited as a viewpoint article
<https://doi.org/10.3390/jfb14100523>
 41. Understanding cell-extracellular matrix interactions for topology-guided tissue regeneration
 Aayushi Randhawa; Sayan Deb Dutta; Keya Ganguly; Tejal V. Patil; Rachmi Luthfikasari; Ki-Taek Lim*
Biocell 2023 47(4): 789-808 IF 1.20 | Invited as a viewpoint article
<https://doi.org/10.32604/biocell.2023.026217>
 42. Perylene-derived hydrophilic carbon dots with polychromatic emissions as superior bioimaging and NIR-responsive photothermal bactericidal agent
 Md Moniruzzaman; Sayan Deb Dutta; Ki-Taek Lim*; Jongsung Kim*
ACS Omega 2022 7(42) 37388–37400 IF 4.132
<https://doi.org/10.1021/acsomega.2c04130>
 43. Multifunctional hydrogels of polyvinyl alcohol/polydopamine functionalized with carbon nanomaterials as flexible sensors
 Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; Ki-Taek Lim*
Materials Today Communications 2022 32 103906 IF 3.383
<https://doi.org/10.1016/j.mtcomm.2022.103906>
 44. Plant-actuated micro/nanorobotics platform: structural design, functional prospects, and biomedical applications
 Rachmi Luthfikasari; Tejal V. Patil; Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Ki-Taek Lim*
Small 2022 Jul;18(30):e2201417 IF 15.153 JCR 5%
<https://doi.org/10.1002/smll.202201417>
 45. Bioengineered lab-grown meat-like constructs through 3D printing of antioxidative protein hydrolysates
 Sayan Deb Dutta; Keya Ganguly; Min-Soo Cheong; Dinesh K. Patel; Tejal V. Patil; Seong-Jun Cho; Ki-Taek Lim*
ACS Applied Materials & Interfaces 2022 14, 30, 34513–34526 IF 10.383 Selected as a Supplementary Cover
<https://doi.org/10.1021/acsaami.2c10620>
 46. Controlled and localized drug delivery using titania nanotubes
 Amogh Kumara; G. Keerthiga; L. Mohana; Sayan Deb Dutta; Pallavi Gupta; Ki-Taek Lim; Tuhin Subhra Santra
Materials Today Communications 2022 July 2022 103843 IF 3.662
<https://doi.org/10.1016/j.mtcomm.2022.103843>
 47. Polyphenol-derived bioactive carbon quantum dot-incorporated multifunctional hydrogels as oxidative stress attenuator for antiaging and in vivo wound-healing applications
 Md Moniruzzaman; Sayan Deb Dutta; Jin Hexiu; Keya Ganguly; Ki-Taek Lim*; Jongsung Kim*
Biomaterials Science 2022 July 2022 Jun 28;10(13):3527-3539 IF 7.590
<https://doi.org/10.1039/d2bm00424k>
 48. Reduced graphene oxide-incorporated calcium phosphate cements with pulsed electromagnetic fields for bone regeneration
 Seonwoo, Hoon; Choung, Han-Wool; Park, Sangbae; Choi, Kyoung Soon; Jang, Kyoung Je; Kim, Jangho; Lim, Ki Taek; Kim, Yeonju; Garg, Pankaj; Pandey, Shambhavi; Lee, Juo; Park, Joo-Cheol ; Choung, Yun-Hoon; Choung, Pill-Hoon; Kim, Soo Young; Chung, Jong Hoon

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D. Patents

1. Korea, A method for In situ fabricated mechanically robust 3D printed gelatin methacrylate-polypyrrole hydrogels with electrical conductivity and continuous microcurrent stimulation of stem cells for accelerating osteogenesis, APN: 10-2024-0033944 (2024.03.11)
2. Korea, A composition of 3D printable Zn/polyphenol-incorporated gelatin/chitosan hydrogel with drug-free antibacterial and macrophage activation and its use for same, APN: 10-2024-0021972 (2024.02.16)
3. Korea, A composition of 3D printed ultra-small carbon nitride-decorated scaffolds with visible light-driven phototherapy for bacterial biofilm eradication, reducing hemorrhage, and immunomodulatory bone regeneration and its use for same, APN: 10-2024-0025834 (2024.02.23)
4. Korea, A simplified method for isolation, characterization, and culture optimization of bovine muscle satellite cells and use of the same, APN: 10-2021-0036743 (2021.03.22) | **Granted No. 10-2594006 (2023.10.20)**
5. Korea, A method of optimal cultivation for preparing cultured meat using plant and insect protein hydrolysate and application of this same, APN: 10-2021-0040899 (2021.03.30) | **Granted No. 10-2581772 (2023.09.19)**
6. Korea, A method for near-infrared laser-responsive spiky-structured microbots for effective killing of cancer cells and bacteria, & its applications, APN 10-2023-0104796 (2023.08.10)
7. Korea, A method for perfusion culture of bone marrow mesenchymal stem cells in 3D nHA/GelMa hydrogel promotes a compact bone graft template, APN 10-2023-0099900 (2023.07.31)
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12. Korea. Extraction, preparation, and characterization of cellulose nanocrystals derived from coffee byproducts, APN: 10-2020-0133226 (2020.10.15) | **Granted No. 10-2506227 (2023.02.28)**
13. Korea, A method for 3D-printed transparent bioadhesive, conductive, and biocompatible hydrogel platforms as sensors and moist electric-generators, APN 10-2023-0021615 (2023.02.17)
14. Korea. A composition for promoting osteogenic differentiation of stem cells comprising an extract from Cirsium setidens (Dunn) Nakai, APN: 10-2020-0153666 (2020.11.17) | **Granted No. 10-2495083 (2023.01.30)**
15. Korea, A method for immunopolarized exosome-laden 3D bioprinted d-ECM skin grafts with all functional physiological features, APN 10-2023-0006670 (2023.01.17)
16. Korea, A method for curcumin releasing bioactive electrospun unzipped CNT/PDA nanofibrous mat with tunable mechanical properties and enhanced NIR-triggered bactericidal efficacy for wound healing, APN 10-2022-0121579 (2022.09.26)
17. Korea, A method for trackable, conductive, and highly luminescent nanocellulose-based printable bio-resins, APN 10-2022-0982193-11 (2022.09.19)
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19. Korea, A method for promoting osteogenic commitment of stem cells using pulsatile pressure stimulation and application thereof, APN 10-2022-0097301 (2022.08.04)
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Granted No.: 10-2362160-0000 (2022.02.08)
22. Korea. TEMPO-CNCs-capped gold nanoparticles for colorimetric detection of pathogenic DNA, APN: 10-2021-0006000 (2021.01.15) |
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25. Korea, A method for shape-engineered carbon quantum dots as mitochondrial stress amplifier for cancer theranostics, APN: 10-2021-0180734 (2021.12.16)
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Granted No. 10-2322023 (2021.10.29)
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30. Korea. A simplified method for isolation, characterization, and culture optimization of bovine muscle satellite cells and use of the same, APN: 10-2021-0036743 (2021.03.22)
31. Korea. TEMPO-CNCs-capped gold nanoparticles for colorimetric detection of pathogenic DNA, APN: 10-2021-0006000 (2021.01.15)
32. Korea. Antioxidative and osteogenic differentiation potentials of Gryllus bimaculatus protein isolates, APN: 10-2021-0003914 (2021.01.12)
33. Korea. A composition for tissue engineering comprising alginate, gelatin, and cellulose nanocrystals and use of the same, APN: 10-2020-0181006 (2020.12.22)
34. Korea. A method for structural elucidation and immune-enhancing effects of a novel polysaccharide from Grifola frondosa,
Granted No. 10-2182507 (2020.11.18)
35. Korea. A composition for promoting osteogenic differentiation of stem cells comprising an extract from Cirsium setidens (Dunn) Nakai, APN: 10-2020-0153666 (2020.11.17)
36. Korea. A method for cellulose nanocrystals extracted from rice husks, Granted No. 10-2172173 (2020.10.26)
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38. Korea. A method for single-walled carbon nanotubes for mesenchymal stem cells' osteogenesis, APN: 10-2019-0002937(2019.01.09). **Granted No. 10-2133820(2020.07.08)**
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40. Korea. An automated bioreactor system for precise control of cell proliferation and differentiation and use of the same, APN: 10-2019-0033794(2019.03.25).
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E. Book & Contributed Chapters

1. [Nanorobotics and Nanodiagnostics in Integrative Biology and Biomedicine](#) (Springer 2023. 01
ISBN: 978-3-031-16083-7
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2. [Functionalized Polymers Synthesis, Characterization and Applications](#) (Taylor and Francis, 2021 | ISBN: 0367420619)
O SD Dutt, KT Lim* Chapter 04: Biodegradable polymers
O K Ganguly, KT Lim* Chapter 06: Functional proteins
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3. [Handbook of Single Cell Technology](#) (Springer, 2021 | ISBN: 978-981-10-8952-7)
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O DK Patel, SD Dutta, KT Lim*, Recent Progress in Cellulose-based Smart Nanocrystals by Agricultural Resources
O K Ganguly, KT Lim*, Nanocellulose-based Polymer Nano-hybrids and Nanocomposite Applications
O SD Dutta, KT Lim*, Carbon Nanotubes-based Nanohybrids for Agricultural and Biological Applications
O WC Shin, SD Dutta, KT Lim*, Naturally derived 3D printed hydrogel scaffolds for agroecosystem and biomedical applications
5. CRISPR and RNAi Systems: NanoBio tools in Plant Breeding and Protection (Elsevier, 2021 | ISBN: 9780128219102), Co-Editor*
O Kamel Abd-Elsalam, KT Lim, Chapter 1. CRISPR and RNAi: A Promising Tool in Plant Nanobiotechnology
O K Ganguly, KT Lim*, Chapter 27. RNAi mediated viral disease resistance in crop plants
O SD Dutta, K Ganguly, KT Lim*, Chapter 26. RNAi-based gene silencing in plant-parasitic nematodes: A road towards crop improvements
O MD Salman Hyer, SD Dutta, K Ganguly, KT Lim*, Chapter 4. Are CRISPR/Cas9 and RNAi-based new technologies to relocate crop pesticides?
6. Aquanotechnology: Applications of Nanomaterials for Water Purification (Elsevier 2021 | ISBN: 9780128211410)
K Ganguly, SD Dutta, DK Patel, KT Lim* Silver nanoparticles for wastewater treatment (Chapter 18)
7. Soft Matter and Biomaterials on the Nanoscale (World Scientific Series in Nanoscience and Nanotechnology 2020)
Engineering Cell–Graphene Interface for Controlling Stem Cell Behavior
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