

**BIOGRAPHICAL SKETCH** (last updated; Dec./19/2022)

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| NAME<br>Lim, Ki-Taek<br><br>ktlim@kangwon.ac.kr; ktlim74@gmail | POSITION TITLE<br>Full Professor<br>Dept. of Biosystems Engineering   Kangwon National University<br>Biorobotics group ( <a href="http://www.bioroboticseng.com">www.bioroboticseng.com</a> )<br>Founder, Biomechagen, Co., Ltd ( <a href="http://www.biomechagen.com">www.biomechagen.com</a> ) |
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**EDUCATION**

| INSTITUTION AND LOCATION  | DEGREE (in Engr.) | MM/YY | FIELD OF STUDY                       |
|---|-------------------|-------|--------------------------------------|
| University of Arkansas  <br>Institute for Nanoscience and Engineering   | Postdoc           | 02/15 | Bio/Nano-Technology                  |
| Seoul National University  <br>School of Dentistry                      | Postdoc           | 02/14 | Tooth Tissue Engineering             |
| Seoul National University  <br>College of Agriculture and Life Sciences | Ph.D.             | 02/13 | Major in Biosystems Engineering      |
| Sungkyunkwan University   | M.S.              | 02/99 | Major in Biomechatronics Engineering |
| Konkuk University   | B.S.              | 02/97 | Major in Agricultural Engineering    |

**A. Personal Statement**

I have studied mechanical engineering, mechatronics, and biological engineering, ultimately aiming for bio-convergence of research findings into biosystems science & engineering. I have published +200 research articles related to tissue engineering and regenerative medicine, stem cells, and bio/nano-materials based on biomechatronics. The research roadmap is the development of a bio-nanorobotic system for future applications with the background of novel bioreactors, non-invasive measurement systems, stem cell culture engineering, and bio/nano-technology toolkits. The goal of the proposed research is to elucidate novel techniques in applications of next-generation 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, Institute for Nanoscience and Engineering, University of Arkansas, Fayetteville, USA |
| 2013-2014 | Senior Researcher, Tooth-Bioengineering Group, Dental Research Institute, Seoul National University       |

**Other Experience and Professional Memberships**

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|-------|--|
| 2022- | Special Editor, International Journal of Bioprinting, IF 7.422   |
| 2022- | Special Editor, Gels, IF 4.702 MDPI  |
| 2022- | Special Editor, Micromachine, IF 3.702 MDPI  |
| 2020- | Reviewer Board, Nanomaterials, IF 4.32 MDPI  |
| 2020- | Special Editor, Micromachines, IF 2.79 MDPI  |
| 2020- | Committee Member, Korea Biomaterials Society   |
| 2020- | Committee Member, Korea Tissue Engineering & Regenerative Medicine Society                                 |
| 2018- | Committee Member, Korea Organoid Society   |
| 2018- | Committee Member, International Conference on Bioresources, Energy, Environment, and Materials Technology  |
| 2017- | Committee Member, Institutional Animal Care and Use Committee, KNU.  |
| 2017- | Editorial Board, Advances in Biomaterials Research (ABR)   |
| 2015- | Committee Member, The delegation of the 12 <sup>th</sup> US-Korea Nano Forum                               |
| 2015- | Committee Member, Korea National Industrial Convergence Center   |
| 2015- | Committee Member, Korea Institute of Planning & Evaluation for Technology in Food, Agriculture, Forestry & |

Program Director/Principal Investigator (Last, First, Middle): Lim, Ki-Taek



Fisheries

2015-2016 Editorial Board, Journal of Biosystems Engineering  
2015-2016 Technical Program Committee Member, IEEE NANOMED  
2015- Associate Editor, Engineering in Agriculture, Environment and Food Journal (Elsevier)  
2010-2014 Instructor, Seoul National University; Konkuk University  
2006-2008 Teaching Assistant, Seoul National University

### C. Selected Peer-reviewed Publications (Selected from 170 peer-reviewed publications)

#### **Most relevant to the current publications (5)**

1. Lim, KT., Electrically stimulated 3D bioprinting of gelatin-polypyrrole hydrogel with dynamic semi-IPN network promotes bone regeneration through activating NOTCH/MAPK/SMAD signaling and immunopolarization. **Biomaterials** 2023 IF 15.723 JCR 3%
2. Lim, KT., Transcriptomic changes towards osteogenic differentiation of mesenchymal stem cells on 3D printed GelMA/CNC hydrogel under pulsatile pressure environment. **Advanced Functional Materials** 2023 IF 11.723 JCR 10%
3. Lim, KT., Cellulose nanocrystals vs. cellulose nanosphere: A comparative study on cytotoxicity and macrophage polarization potential. **Carbohydrate Polymers** 2023 IF 10.723 JCR 3%
4. Lim, KT., Magnetic field-assisted aligned patterning in an alginate-silk fibroin/nanocellulose composite for guided wound healing. **Carbohydrate Polymers** 2022 IF 10.723 JCR 3%
5. Lim, KT., 3D-printable chitosan/silk fibroin/cellulose nanoparticle scaffolds for bone regeneration via M2 macrophage polarization. **Carbohydrate Polymers** 2022 IF 10.723 JCR 3%
6. Lim, KT., Functionalized chitosan/spherical nanocellulose-based injectable hydrogels with superior antibacterial efficiency for improved wound healing. **Carbohydrate Polymers** 2022 IF 10.723 JCR 3%
7. Lim, KT., Bioengineered lab-grown meat-like constructs through 3D printing of antioxidative protein hydrolysates **ACS Applied Materials & Interfaces** 2022 IF 10.383

## **Publications**

1. 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 IF 4.132
2. 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* 2022 IF 5.859
3. Cellulose nanosphere-assisted freeze-tolerant biocompatible hydrogel with self-healable and shape-memorable performances for flexible sensor  
Dinesh K. Patel; Keya Ganguly; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*Carbohydrate Polymers* 2022 IF 10.723
4. [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 IF 3.383  
<https://doi.org/10.1016/j.mtcomm.2022.103906>
5. [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 July 2201417 IF 15.153  
<https://doi.org/10.1002/sml.202201417>
6. Micro and nanoscale-assisted 3D constructs to improve hemostasis and wound healing applications: structural and functional prospects of biointerfaces  
Keya Ganguly; Mercedes Espinal; Sayan Deb Dutta; Dinesh K. Patel; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*International Journal of Bioprinting* 2022 IF 7.422 (Under Review)
7. 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 IF 10.383 (Accepted)
8. [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* July 2022 103843 IF 3.662  
<https://doi.org/10.1016/j.mtcomm.2022.103843>
9. [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* July 2022 IF 7.590  
<https://doi.org/10.1039/D2BM00424K>
10. [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, Joo; Park, Joo-Cheol ; Choung, Yun-Hoon; Choung, Pill-Hoon; Kim, Soo Young; Chung, Jong Hoon  
*RSC Advances* 2022, 12, 5557-5570 IF 4.036  
<https://doi.org/10.1039/D1RA05717K>
11. Recent advances in 3D printing of polymers for biomedical applications  
Aayushi Randhawa; Sayan Deb Dutta; Keya Ganguly; Dinesh K. Patel; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*Micromachine* 2022 IF 3.523 | Invited as a special issue | [Special issue as a guest editor](#)
12. [3D Printing of nanogels and their composites for tissue engineering](#)  
Aayushi Randhawa; Sayan Deb Dutta; Keya Ganguly; Dinesh K. Patel; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*Gels* 2022 IF 4.432 | Invited as a special issue | [Special issue as a guest editor](#)
13. [A review of properties of nanocellulose, its synthesis, and potential in biomedical applications](#)  
Aayushi Randhawa; Sayan Deb Dutta; Keya Ganguly; Dinesh K. Patel; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*Applied Sciences* 2022 IF 2.838 | Invited as a special issue
14. [Wet chemistry-based processing of tunable polychromatic carbon quantum dots for multicolor bioimaging and enhanced NIR-triggered photothermal bactericidal efficacy](#)  
Md Moniruzzaman; Sayan Deb Dutta; [Ki-Taek Lim\\*](#); Jongsung Kim\*  
*Applied Surface Science* Volume 597, 30 September 2022, 153630 IF 7.392 JCR 3%  
Ranked 1 out of 21 in Materials Science, Coatings & Films

<https://doi.org/10.1016/j.apsusc.2022.153630>

15. [Functionalized chitosan/spherical nanocellulose-based injectable hydrogels with superior antibacterial efficiency for improved wound healing](#)  
Dinesh K. Patel; Keya Ganguly; Jin Hexiu; Sayan Deb Dutta; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*Carbohydrate Polymers* May 2022, 284, 119202-119217 IF 10.723 JCR 3%  
<https://doi.org/10.1016/j.carbpol.2022.119202>
16. [Magnetic field-assisted aligned patterning in an alginate-silk fibroin/nanocellulose composite for guided wound healing](#)  
Keya Ganguly; Jin Hexiu; Sayan Deb Dutta; Dinesh K. Patel; Tejal V. Patil; [Ki-Taek Lim\\*](#)  
*Carbohydrate Polymers* July 2022 IF 10.723 JCR 3%  
<https://doi.org/10.1016/j.carbpol.2022.119321>
17. [Two-photon excitable membrane targeting polyphenolic carbon dots for long-term imaging and pH-responsive chemotherapeutic drug delivery for synergistic tumor therapy](#)  
Sayan Deb Dutta; Jin Hexiu; Jongsung Kim; Sourav Sarkar; Jagannath Mondal; Yong-Kyu Lee; Jeong Man An; Md Moniruzzaman; [Ki-Taek Lim\\*](#)  
*Biomaterials Science* May 2022 IF 7.590 | Selected as a front cover  
<https://doi.org/10.1039/D1BM01832A>
18. [3D-printable chitosan/silk fibroin/cellulose nanoparticle scaffolds for bone regeneration via M2 macrophage polarization](#)  
Dinesh K. Patel; Sayan Deb Dutta; Jin Hexiu; Keya Ganguly; [Ki-Taek Lim\\*](#)  
*Carbohydrate Polymers* April 2022, 281, 119077-119095 IF 10.723 JCR 3%  
<https://doi.org/10.1016/j.carbpol.2021.119077>
19. [Nanocellulose, a versatile platform: from the delivery of active molecules to tissue engineering applications](#)  
Tejal V. Patil; Dinesh K. Patel; Sayan Deb Dutta; Keya Ganguly; Tuhin Subhra Santra; [Ki-Taek Lim\\*](#)  
*Bioactive Materials* March 2022, 9, 566-589 IF 16.874 JCR 1%  
<https://doi.org/10.1016/j.bioactmat.2021.07.006>
20. [A review on microfluidic nanomaterials: from synthesis to biomedical applications](#)  
Kavitha Illath; Srabani Kar; Pallavi Gupta; Ashwini Shinde; Syrpailyne Wankhar; Fan-Gang Tseng; [Ki-Taek Lim](#); Moeto Nagai; Tuhin Subhra Santra\*  
*Biomaterials* January 2022, 280, 121247-121280 IF 15.304 JCR 3%  
<https://doi.org/10.1016/j.biomaterials.2021.121247>
21. [Mesenchymal stem cells, the secretome and biomaterials: regenerative medicine applications](#)  
[Ki-Taek Lim\\*](#); Tejal V. Patil; Sayan Deb Dutta; Keya Ganguly; Dinesh K. Patel  
*Biocell* June 2022, Vol 46 No 10, pp 2201-2208 IF 1.110 | Invited as a viewpoint article  
<https://10.32604/biocell.2022.020013>
22. Tejal V. Patil, Dinesh K. Patel, Sayan Deb Dutta, Keya Ganguly, Aayushi Randhawa and [Ki-Taek Lim\\*](#) [Carbon nanotubes-based hydrogels for bacterial eradication and wound dressing applications](#) *Applied Sciences*, 2021, IF 2.679 | Invited as a feature article  
<https://doi.org/10.3390/app11209550>
23. [Ki-Taek Lim\\*](#), Dinesh K. Patel, Sayan Deb Dutt and Keya Ganguly [Fluid flow mechanical stimulation-assisted a cartridge device for osteogenic differentiation of human mesenchymal stem cells](#) *Micromachines*, 2021, 12(8), 927 IF 2.891 <https://doi.org/10.3390/mi12080927>
24. SD Dutta; T Park; K Ganguly; DK Patel; Bin J; MC Kim; [KT Lim\\*](#) [Evaluation of the sensing potential of stem cell-secreted proteins via a micro-chip device under electromagnetic field stimulation](#) *ACS Applied Bio Materials*, 2021 4(9) 6853-6864 August | Journal Cover  
<https://doi.org/10.1021/acsbm.1c00561>
25. Tejal V. Patil, Dinesh K. Patel, Sayan Deb Dutta, Keya Ganguly and [Ki-Taek Lim\\*](#) [Graphene oxide-based stimuli-responsive platforms for biomedical application](#) *Molecules*, 2021, 26,0, IF 4.411 | Invited as a feature article <https://doi.org/10.3390/molecules26092797>
26. Sayan D. Dutta, Jin Bin, Keya Ganguly, Dinesh K. Patel and [Ki-Taek Lim\\*](#) [Electromagnetic-field-assisted cell-laden 3D printed poloxamer-407 hydrogel for enhanced osteogenesis](#) *RSC Advances*, 2021, 11, 20342 IF 3.361 <https://doi.org/10.1039/D1RA01143J>
27. Ashwini Shinde, Kavitha Illath, Pallavi Gupta, Pallavi Shinde, [Ki-Taek Lim](#), Moeto Nagai, Tuhin Subhra Santra [A review of single-cell adhesion force kinetics and applications](#) *Cells*, 2021, 10 (3): 577 IF 6.600 <https://doi.org/10.3390/cells10030577>
28. Dinesh K. Patel+, Sayan Deb Dutta+, Woochul Shin, Keya Ganguly, and [Ki-Taek Lim\\*](#) [Fabrication and characterization of 3D printable nanocellulose-based hydrogel for tissue engineering](#) *RSC Advances*, 2021, 11, 7466 - 7478, IF 3.361 <https://doi.org/10.1039/D0RA09620B>
29. Patel DK, SD Dutta, G Keya and [Lim KT\\*](#) [Enhanced osteogenic potential of unzipped carbon nanotubes for tissue engineering](#) *Journal of Biomedical Materials Research Part A*, 2021 Oct, 109(10): 1869-1880 IF 4.396 <https://doi.org/10.1002/jbm.a.37179>
30. SD Dutta, DK Patel, K Ganguly and [KT Lim\\*](#) [Effects of GABA/β-glucan supplements on melatonin and serotonin content extracted from natural resources](#) *PLoS ONE*, 2021 Mar, 16(3): 0247890 IF 3.204 <https://doi.org/10.1371/journal.pone.0247890>

31. Dinesh K. Patel, Sayan Deb Dutta, Keya Ganguly and Ki-Taek Lim\* [Multifunctional bioactive chitosan/cellulose nanocrystals scaffolds for the eradication of bacterial growth and sustained drug delivery](#) *International Journal of Biological Macromolecules*, 2021, 170 (15), 178-188, IF 6.953 JCR 10% <https://doi.org/10.1016/j.ijbiomac.2020.12.145>
32. K Ganguly, DK Patel, SD Dutta and KT Lim\* [TEMPO-CNCs-capped gold nanoparticles for colorimetric detection of pathogenic DNA](#) *ACS Omega*, 2021, 16 (19): 12382-12930 IF 3.512 [A front cover \(Selected\) ACS LiveSlides™ presentation ACS LiveSlides \(Selected\)](#) <https://doi.org/10.1021/acsomega.1c00359>
33. K Ganguly, SD Dutta, MS Jeong, DK Patel, SJ Cho and KT Lim\* [Naturally-derived protein extract from \*Gryllus bimaculatus\* improves antioxidant properties and promotes osteogenic differentiation of hBMSCs](#) *PLoS ONE*, 2021, IF 3.204 <https://doi.org/10.1371/journal.pone.0249291>
34. Patel DK, SD Dutta, G Keya and Lim KT\* [Mushroom-derived bioactive molecules as immunotherapeutic agents: A review](#) *Molecules*, 2021, 26(5), 1359 IF 4.411 <https://doi.org/10.3390/molecules26051359>
35. SD Dutta, DK Patel, K Ganguly and KT Lim\* [Isolation and characterization of cellulose nanocrystals from the coffee grounds for tissue engineering](#) *Materials Letters*, 2021, 287 (15): 129311 IF 3.423 <https://doi.org/10.1016/j.matlet.2021.129311>
36. SD Dutta, H Jin, DK Patel, K Ganguly and KT Lim\* [3D printed bioactive and biodegradable hydrogel scaffolds with alginate/gelatin/cellulose nanocrystals scaffolds for tissue engineering](#) *International Journal of Biological Macromolecules*, 2021, 167 (15): 644-658 IF 6.953 JCR 10% <https://doi.org/10.1016/j.ijbiomac.2020.12.011>
37. SD Dutta, Patel DK, B Jin, SI Choi, OH Lee and KT Lim\* [Effect of \*Cirsium setidens\* \(Dunn\) Nakai. on the osteogenic differentiation of stem cells](#) *Molecular Medicine Report*, 2021, 23 (4), 1-1 IF 2.952 <https://doi.org/10.3892/mmr.2021.11903>
38. KJ Jang, H Seonwoo, M Yang, S Park, KT Lim, J Kim, PH Choung and JH Chung [Development and characterization of waste equine bone-derived calcium phosphate cement with human alveolar bone-derived mesenchymal stem cells](#) *Connective Tissue Research*, 2021, 62 (2):164-175, IF 3.417 <https://doi.org/10.1080/03008207.2019.1655003>
39. K Ganguly, SD Dutta, DK Patel, SJ Cho, and KT Lim\* [Protoetia brevitarsis seoulensis derived protein isolate with enhanced osteomodulatory and antioxidative property](#) *Molecules*, 2020, 25(54) IF 3.267
40. Lim KT\* DK. Patel, SD Dutta, HW Choung, H Jin, JH Chung\*, Evaluation of bone regeneration potential of human teeth derived bioceramics for tissue engineering, IF 4.324 *Nanomaterials*
41. SD Dutta, Patel DK, B Jin, SI Choi, OH Lee, KT Lim\*, Methanol extracts of *Cirsium setidens* (Dunn) Nakai. promote osteogenic differentiation of stem cells. IF 2.100 *Molecular Medicine Report*
42. Lim KT\*, H Jin, Patel DK, J Kim, H Seonwoo, JH Chung. 2020. [Evaluation of the osteogenic potential of stem cells in the presence of growth hormone under magnetic field stimulation](#). *ACS Biomaterials Science & Engineering*. (Journal Cover)
43. Patel DK, YR Seo, SD Dutta, OH Lee, Lim KT\*, 2020. [Influence of maitake \(\*Grifola frondosa\*\) particle sizes on human mesenchymal stem cells and in vivo evaluation of their therapeutic potential](#). *Biomed Research International*
44. KJ Jang, S Kim, S Park, W Kim, Y Gwon, S Park, KT Lim, H Seonwoo, J Kim, 2020. [Lithographically fabricated HA-incorporated PCL nanopatterned patch for tissue engineering](#). *Applied Sciences*
45. Patel DK, HB Kim, SD Dutta, K Ganguly, Lim KT\*, 2020. [A concise review of carbon nanotube based nanomaterials for agricultural and biotechnological applications](#). *Materials*
46. Hexiu Jin, Yi Xu, Yu Qi, Xuejiu Wang, Dinesh K. Patel, Renji Chen\* and Ki-Taek Lim\*, 2020. [Evaluation of osteogenic/cementogenic modulating potential of PAI-1transfected media for stem cells](#). *IEEE Transactions on NanoBioscience*
47. X YUNZE1, SD DUTTA, J BIN, L MENG MENG, S ZAIXIAN, L XIWEN, K YANG, and KT LIM\*, 2020. [Enhanced osteogenic differentiation of human periodontal ligament stem cells by suberoylanilide hydroxamic acid](#). *BIOCELL*
48. K Ganguly, DK Patel, SD Dutta, KT Lim\*, 2020. [Stimuli-Responsive Self-Assembly of Cellulose Nanocrystals \(CNCs\): Structures, Functions, and Biological Applications](#). *International journal of biological macromolecules* *International journal of biological macromolecules*, 155(5),456
49. Patel DK, SD Dutta, Lim KT\*,2020. [Immunotherapeutic agents as medicinal usages of mushrooms: Regulation of cellular functions and their immunomodulating potentials](#). *Food Reviews International*
50. Patel DK, B Jin, SD Dutta, Lim KT\*, 2020. [Osteogenic potential of human mesenchymal stem cells on eggshells-derived hydroxyapatite nanoparticles for tissue engineering](#). *Journal of Biomedical Materials Research: Part B - Applied Biomaterials* (Epub ahead of print)
51. KJ Jang, H Seonwoo, M Yang, S Park, KT Lim, J Kim, PH Choung, JH Chung, 2020. [Development and characterization of waste equine bone-derived calcium phosphate cement with human alveolar bone-derived mesenchymal stem cells](#). *Connective Tissue Research* (Epub ahead of print)
52. Patel DK, YR Seo, SD Dutta, Lim KT\*, 2019. [Enhanced Osteogenesis of Mesenchymal Stem Cells on Electrospun Cellulose Nanocrystals/Poly\(ε-caprolactone\) Nanofibers on Graphene Oxide Substrates](#). *RSC Advances*, 9, 36040
53. S Park, T Kim, Y Gwon, S Kim, D Kim, HH Park, KT Lim, HE Jeong, K Kim, J Kim, 2019. [Graphene-Layered Eggshell Membrane as a Flexible and Functional Scaffold for Enhanced Proliferation and Differentiation of Stem Cells](#). *ACS Applied Bio Materials* (with Front Cover)
54. Seonwoo H, Kim SW, Shin B, Jang KJ, Lee M, Choo OS, Choi MJ, Kim J, Lim KT, Jang JH, Chung JH, Choung YH. 2019. [Latent stem cell-stimulating therapy for regeneration of chronic tympanic membrane perforations using IGFBP2-releasing chitosan patch scaffolds](#). *Journal of Biomaterials Applications*. *J Biomater Appl*. 2019 Aug;34(2):198-207.

55. **KT Lim\***, DK Patel, HW Choung, H Seonwoo, J Kim, JH Chung, 2019. [Evaluation of bone regeneration potential of long-term soaked natural hydroxyapatite](#). ACS Applied Bio Materials (*with Front Cover*)
56. SD Dutta, DK Patel, YR Seo, CW Park, SH Lee, JW Kim, J Kim, **Lim KT\***, 2019. [In vitro Biocompatibility of Electrospun Poly\(e-caprolactone\)/ Cellulose Nanocrystals Nanofibers for Tissue Engineering](#). Journal of Nanomaterials
57. KJ Jang, H Seonwoo, M Yang, S Park, **KT Lim**, J Kim, PH Choung, JH Chung, 2019. [Development and characterization of waste equine bone-derived calcium phosphate cements with human alveolar bone-derived mesenchymal stem cells](#). Connective Tissue Research
58. **KT Lim\***, DK Patel, H Seonwoo, J Kim, JH Chung, 2019. [A fully automated bioreactor system for precise control of stem cell proliferation and differentiation](#). Biochemical Engineering Journal
59. Patel DK, **Lim KT\***, 2019. [Biomimetic Polymer-Based Engineered Scaffolds for Improved Stem Cell Function](#). Materials. 2019 Sep 11;12(18)
60. **DK Patel**, MH Kim, **Lim KT\***, 2019. [Synthesis and Characterization of Eggshell-Derived Hydroxyapatite Bioceramics](#). Journal of Biosystems Engineering
61. Kim HB, Jin B, Patel DK, Kim JW, Kim J, Seonwoo H, **Lim KT\***, 2019. [Enhanced osteogenesis of human mesenchymal stem cells in presence of single-walled carbon nanotubes](#). IEEE Transactions on Nanobioscience. 2019 Jul;18(3):463-468.
62. HB Kim, DK Patel, YR Seo, **Lim KT\***, 2019. [3D-Printed Scaffolds with Reinforced Poly \(Lactic Acid\)/Carbon Nanotube Filaments Based on Melt Extrusion](#). Journal of Biosystems Engineering
63. SD Dutta, DK Patel, **KT Lim\***, 2019. [Functional cellulose-based hydrogels as extracellular matrices for tissue engineering](#). JOURNAL OF BIOLOGICAL ENGINEERING
64. Patel DK, **Lim KT\***, 2019. [Nanocellulose-based polymer hybrids and their emerging applications in biomedical engineering and water purification](#). RSC ADVANCES
65. Seo YR, Patel DK, Shin WC, Sim WS, Lee OH, **Lim KT\***, 2019. [Structural elucidation and immune-enhancing effects of novel polysaccharide from Grifola frondosa](#). Biomed Research International. 2019 Apr 16;2019:7528609.
66. Patel DK, Seo YR, **Lim KT\***, 2019. [Stimuli-Responsive Graphene Nanohybrids for Biomedical Applications](#). Stem Cells International. 2019 Apr 2;2019:9831853
67. Seonwoo H, Jang KJ, Lee D, Park S, Lee M, Park S, **Lim KT**, Kim J, Chung JH. 2019. [Neurogenic Differentiation of Human Dental Pulp Stem Cells on Graphene-Polycaprolactone](#). Nanomaterials. 2018 Jul 21;8(7).
68. WS Sim, SI Choi, TD Jung, BY Cho, SH Choi, X Han, JH Lee, YR Seo, **Lim KT**, OH Lee. 2019. [β-Glucan Content and Antioxidant Activity of Mixed Extract from Sarcodon aspratus and Rice Bran](#). Journal of Food Hygiene and Safety.
69. S Park, KS Choi, D Kim, W Kim, D Lee, HN Kim, H Hyun, **Lim KT**, JW Kim, YR Kim, J Kim. 2018. [Controlled extracellular topographical and chemical cues for acceleration of neuronal development](#). Journal of Industrial and Engineering.
70. Seo YR, JW Kim, S Hoon, J Kim, JH Chung, **Lim KT\***, 2018. [Cellulose-based Nanocrystals: Sources and Applications via Agricultural Byproducts](#). Journal of Biosystems Engineering (*with Front Cover*).
71. MC Lee, H Seonwoo, P Garg, KJ Jang, S Pandey, HB Kim, SB Park, **Lim KT**, JH Chung. 2018. [Development of a Bio-Electrospray System for Cell and Non-viral Gene Delivery](#). RSC Advances. 2018. Accepted
72. D Lee, KS Choi, D Kim, S Park, W Kim KJ Jang, **Lim KT**, JH Chung, H Seonwoo, J Kim. 2017. [Iron Oxide Nanoparticle-incorporated Alginate Capsules as Magnetic Field-assisted Potential Delivery Platforms for Agriculture Pesticides and Biocontrol Agents](#). Journal of Biosystems Engineering.
73. HB Kim, YR Seo, KJ Chang, SB Park, H Seonwoo, JW Kim, J Kim, **Lim KT\***, 2017. [Mechanical and Biological Characteristics of Reinforced 3D Printing Filament Composites with Agricultural By-product](#). Food engineering progress
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## D. Patents

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2. Korea, A method for expansion of human mesenchymal stem cells using the wave bioreactor system with pulsed electromagnetic field stimulation for enhanced cell culture performance, 줄기세포배양 증진을 위한 자극기술 모델 기반 바이오리액터시스템 및 이의 응용, 출원 APN [10-2022-0008586 \(2022.01.20\)](#)
3. 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, 미세전류 자극 리액터 기반 기계적 강도를 가지는 젤라틴, 메타아크릴산 및 폴리피롤 3D 프린팅 하이드로겔 및 그 하이드로겔의 인간 중간엽 줄기세포 골세포 분화방법 및 그 응용, 출원 APN: [10-2021-1529703 \(2021.12.30\)](#)
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