

Curriculum Vitae

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◆ 학위

기간	학위	학교	학과	지도교수
2005.3-2008.2	박사	한양대학교	화학공학과	김 병 수
2002.3-2004.2	석사	한양대학교	화학공학과	김 병 수
1998.3-2002.2	학사	조선대학교	화학공학과	-

◆ 경력

기간	소속	직위
2019.03~현재	원광대학교 화학융합공학과	조교수
2018.09~2019.02	연세대학교 의과대학, 신경외과	박사 후 과정
2017.03- 2018.07	TnR biofab.	책임연구원
2013.11-2017.02	Department of Bioengineering, Clemson University, USA	박사 후 과정
2010.02-2013.10	연세대학교 의과대학, 신경외과	박사 후 과정
2012.09-2012.12	송실 대학교 공과대학 유기 신소재파이버 공학과, 바이오 소재 강의	강 사
2008.01-2010.02	종근당 종합연구소	수석연구원

◆Publications

1. Cho YS, **Gwak SJ**, Cho YS. Fabrication of Polycaprolactone/Nano Hydroxyapatite (PCL/nHA) 3D Scaffold with Enhanced In Vitro Cell Response via Design for Additive Manufacturing (DfAM). *Polymers(Basel)*.2021 Apr. 13(9):1394.
doi: 10.3390/polym13091394.
2. Jeong HJ, Yun YM, Lee SJ, Ha Y, **Gwak SJ**. Biomaterials and strategies for repairing spinal cord lesions. *Neurochemistry International*. 2021. Mar.
doi.org/10.1016/j.neuint.2021.104973
3. Choi EJ, Bae SG, Kim DG, Yang GH, Lee KH, You HJ, KangHJ, **Gwak SJ**, An SH, Jeon HJ. Characterization and intracellular mechanism of electrospun poly (ϵ -caprolactone) (PCL) fibers incorporated with bone-dECM powder as a potential membrane for guided bone regeneration. *Journal of Industrial and Engineering Chemistry*. 2021. February;94: 282-291.
4. **Gwak SJ**, Che L, Yun Y, Lee M, Ha Y. Combination Therapy by Tissue-Specific Suicide Gene and Bevacizumab in Intramedullary Spinal Cord Tumor. *Yonsei Medical Journal*. 2020 Dec;61(12):1042-1049.
5. Jeong HJ, **Gwak SJ**, Seo KD, Lee S, Yun JH, Cho YS, Lee SJ. Fabrication of Three-Dimensional Composite Scaffold for Simultaneous Alveolar Bone Regeneration in Dental Implant Installation. *International Journal of Molecular Sciences*. 2020 Mar 9;21(5):1863.
6. Halman JR, Kim KT, **Gwak SJ**, Pace R, Johnson MB, Chandler MR, Rackley L, Viard M, Marriott I, Lee JS, Afonin KA., A cationic amphiphilic co-polymer as a carrier of nucleic acid nanoparticles (Nanps) for controlled gene silencing, immunostimulation, and biodistribution. *Nanomedicine*. 2020 Jan;23
7. **Gwak SJ**, Lee JS, Suicide Gene Therapy By Amphiphilic Copolymer Nanocarrier for Spinal Cord Tumor. *Nanomaterials*. 2019;9(4).
8. Macks C, **Gwak SJ**, Lynn M, Webb K, Lee JS. Rolipram-loaded polymeric micelle nanoparticle reduces secondary injury after rat compression spinal cord injury. *Journal of Neurotrauma*. 2018;35:582-592
9. **Gwak SJ**, Macks C, Webb K, Lee JS. Physico-chemical stability and transfection efficiency of cationic, amphiphilic polymeric micelle/pDNA polyplexes for spinal cord injury repair. *Scientific Reports*. 2017; 7:11247

10. **Gwak SJ**, Macks C, Jeong DU, Kindy M, Lynn M, Webb K, Lee JS. RhoA knockdown by cationic amphiphilic copolymer/siRhoA polyplexes enhances axonal regeneration in rat spinal cord injury model. *Biomaterials*. 2017;121:155-166
11. **Gwak SJ**, Nice J, Zhang J, Green B, Macks C, Bae S, Webb K, Lee JS. Cationic, amphiphilic copolymer micelles as nucleic acid carriers for enhanced transfection in rat spinal cord. *Acta Biomater*. 2016;35:98-108.
12. **Gwak SJ**, Yun Y, Yoon do H, Kim KN, Ha Y. Therapeutic use of 3 β -[N-(N',N'-Dimethylaminoethane) Carbamoyl] Cholesterol-Modified PLGA nanospheres as gene delivery vehicles for spinal cord injury. *PLoS One*. 2016;1(1):e0147389.
13. **Gwak SJ**, Koo HB, Yun YM, Yhee JY, Lee HY, Yoon DH, Kim K, Ha Y. Multifunctional nanoparticles for gene delivery and spinal cord injury. *Journal of biomedical materials research part A*. 2015;103(11):3474-82
14. **Gwak SJ**, An SS, Yang MS, Joe E, Kim DH, Yoon do H, Kim KN, Ha Y. Effect of combined bevacizumab and temozolomide treatment on intramedullary spinal cord tumor. *Spine (Phila Pa 1976)*. 2014;39(2):E65-73.
15. An SH, Pennant WA, **Gwak SJ**, Ha Yoon, Choi SH, Efficient nonviral gene therapy for Intramedullary spinal cord tumor. *Spinal cord*. 2014;52, 3-8
16. Oh JS, An SS, **Gwak SJ**, Pennant WA, Kim KN, Yoon do H, Ha Y. Hypoxia-specific VEGF-expressing neural stem cells in spinal cord injury model. *Neuroreport*. 2012;23(3):174-178
17. Kim HJ, Oh JS, An SS, Pennant WA, **Gwak SJ**, Kim AN, Han PK, Yoon DH, Kim KN, Ha Y. Hypoxia-specific GM-CSF-overexpressing neural stem cells improve graft survival and functional recovery in spinal cord injury. *Gene Therapy*. 2012;19(5):513-521
18. **Gwak SJ**, Jung JK, Oh JS, An SS, Pennant WA, Kim HJ, Yoon do H, Kim KN, Ha Y. Chitosan/TPP-Hyaluronic acid nanoparticles: a new vehicle for gene delivery to the spinal cord. *Journal of Biomaterials Science, Polymer Edition*. 2012;23:1437-1450
19. An SS, Pennant WA, Ha Y, Oh JS, Kim HJ, **Gwak SJ**, Yoon do H, Kim KN. Hypoxia-induced Expression of VEGF in Organotypic Spinal Cord Slice Culture. *Neuroreport*. 2011;22(2)55-60
20. Oh JS, Kim KN, An SS, Pennant WA, Kim HJ, **Gwak SJ**, Yoon DH, Lim MH, Choi BH, Ha Y. Co-transplantation of mouse neural stem cells (mNSCs) with adipose tissue-derived

mesenchymal stem cells improves mNSC survival in a rat spinal cord injury model. *Cell Transplantation*. 2011;20(6):837-849

21. Liu ML, Oh JS, An SS, Pennant WA, Kim HJ, **Gwak SJ**, Kim KN, Lee M, Ha Y. Controlled nonviral gene delivery and expression using stable neural stem cell line transfected with a hypoxia-inducible gene expression system. *Journal of Gene Medicine*. 2010;12(12):990-1001.
22. Bhang SH, **Gwak SJ**, Lee TJ, Kim SS, Park HH, Park MH, Lee DH, Lee SH, Kim BS. Cyclic mechanical strain promotes transforming-growth-factor-beta1-mediated cardiomyogenic marker expression in bone-marrow-derived mesenchymal stem cells in vitro. *Biotechnol Appl Biochem*. 2010;7;55(4):191-7. **(Co-first)**
23. Lee SJ, Lee IH, Park JH, **Gwak SJ**, Rhie JW, Cho DW, Ko TJ, Kim DS. Development of hybrid scaffold and bioreactor for cartilage regeneration. *Chinese Science Bulletin*. 2009; 54(19):3608-3612
24. **Gwak SJ**, Bhang SH, Yang HS, Kim SS, Lee DH, Lee SH, Kim BS. In vitro cardiomyogenic differentiation of adipose-derived stromal cells using transforming growth factor-beta1. *Cell biochemistry and function*. 2009 ; 27(3):148-54.
25. Kim SS, **Gwak SJ**, Han J, Park MH, Song KW, Kim BS. Regeneration of kidney tissue using in vitro cultured fetal kidney cells. *Experimental & molecular medicine*. 2008 ; 31;40(4):361-9.
26. **Gwak SJ**, Kim BS. Poly(lactic-co-glycolic acid) nanosphere as a vehicle for gene delivery to human cord blood-derived mesenchymal stem cells: comparison with polyethylenimine. *Biotechnology letters*. 2008 ;30(7):1177-82.
27. Kim SS, **Gwak SJ**, Kim BS. Orthotopic bone formation by implantation of apatite-coated poly(lactide-co-glycolide)/hydroxyapatite composite particulates and bone morphogenetic protein-2. *Journal of biomedical materials research. Part A*. 2008 ; 87(1):245-53.
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29. **Gwak SJ**, Bhang SH, Kim IK, Kim SS, Cho SW, Jeon O, Yoo KJ, Putnam AJ, Kim BS. The

- effect of cyclic strain on embryonic stem cell-derived cardiomyocytes. *Biomaterials*. 2008 ; 29(7):844-56.
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33. Cho SW, Jeon O, Lim JE, **Gwak SJ**, Kim SS, Choi CY, Kim DI, Kim BS. Preliminary experience with tissue engineering of a venous vascular patch by using bone marrow-derived cells and a hybrid biodegradable polymer scaffold. *Journal of Vascular Surgery*. 2006 ; 44(6):1329-40.
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35. Kim SS, Lim SH, Cho SW, **Gwak SJ**, Hong YS, Chang BC, Park MH, Song KW, Choi CY, Kim BS. Tissue engineering of heart valves by recellularization of glutaraldehyde-fixed porcine valves using bone marrow-derived cells. *Experimental & molecular medicine*. 2006 ;38(3):273-83.
36. **Gwak SJ**, Choi D, Paik SS, Cho SW, Kim SS, Choi CY, Kim BS. A method for the effective formation of hepatocyte spheroids using a biodegradable polymer nanosphere. *Journal of biomedical materials research. Part A*. 2006 ;78(2):268-75.
37. Cho SW, **Gwak SJ**, Kim IK, Cho MC, Hwang KK, Kwon JS, Choi CY, Yoo KJ, Kim BS. Granulocyte colony-stimulating factor treatment enhances the efficacy of cellular cardiomyoplasty with transplantation of embryonic stem cell-derived cardiomyocytes in infarcted myocardium. *Biochemical and biophysical research communications*. 2006 ;340(2):573-82.
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◆수상경력

1. The Korean association of hepato-biliary–Pancreatic surgery, Seoul, Korea, October 2004, Student Travel Award “A method for the effective formation of hepatocyte spheroids using a biodegradable polymer nanosphere”
2. The 7th Annual Meeting of the Korean Tissue Engineering and Regenerative Medicine Society, Seoul, Korea, July 2005. Student Travel Award: “Combined therapy using human cord blood cell transplantation and bFGF delivery for treatment of hindlimb ischemia”

◆특허

1. 심근세포로의 분화를 위한 지방유래 기질 세포의 시험관내 배양방법
Cyclic mechanical strain promotes transforming-growth-factor-beta1-mediated cardiomyogenic marker expression in bone-marrow-derived mesenchymal stem cells in vitro. 국내등록번호 10-0956371
2. 척수 조직 유전자 전달을 위한 Chitosan/TPP-Hyaluronic acid 나노파티클 개발
Chitosan/TPP-Hyaluronic acid nanoparticles: a new vehicle for gene delivery to the spinal cord. 국내등록번호. 10-1294719