

LEI CAI

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EDUCATION

Stanford University, Materials Science & Engineering
The University of Tennessee, Polymer Engineering
Zhejiang University (China), Polymer Science & Engineering

Postdoctoral Scholar
Ph.D. 2012
B.E. 2008

RESEARCH EXPERIENCE

- 2012 - Present Postdoctoral Scholar, Materials Science & Engineering, Stanford University.
 Advisor: **Sarah Heilshorn**, Ph.D.
- *Designed, synthesized, and validated injectable, protein-based hydrogel carriers that significantly improved the viability of transplanted cells.*
 - *Designed tunable, engineered extracellular matrices for fundamental cell-matrix studies.*
 - *Developed two novel drug delivery systems to deliver neurotrophic and pro-angiogenic peptides and proteins and characterized these systems using in vitro and in vivo models.*
- 2008 - 2012 Doctoral Thesis, Polymer Engineering, The University of Tennessee.
 Advisor: **Shanfeng Wang**, Ph.D.
- *Synthesized novel photo-crosslinkable polyester-based polymers to regulate surface chemistry, topography, and mechanical properties for study of cellular responses.*
 - *Functionalized biomaterials with bioactive peptides to enhance neuronal cell growth.*
 - *Developed injectable, biodegradable polymeric scaffolds for bone and nerve tissue engineering.*
- 2006 - 2008 Undergraduate Thesis, Polymer Science & Engineering, Zhejiang University.
 Advisor: **Qiaoling Hu**, Ph.D.
- *Prepared chitosan/hydroxyapatite membranes for guided tissue regeneration.*
- 2005 - 2006 Undergraduate Research Assistant, Chemistry, Zhejiang University.
 Advisor: **Longguan Zhu**, Ph.D.
- *Studied hydrogen-bonds using Cu ion crystals coordinated by 2,2-bipyridine and chloro ligands.*

HONORS & AWARDS

- 2015 **Ruth L. Kirschstein NIH NRSA Postdoctoral Fellowship**,
 Funded by National Heart, Lung, and Blood Institute (NHLBI).
- 2014 **Interdisciplinary Scholars Award**, Stanford Neurosciences Institute, Stanford University.
 Presented to five postdoctoral scholars from a variety of disciplines annually.
- 2014 **Best Poster Award**, Gordon Research Conference, Signal Transduction by Engineered
 Extracellular Matrices, Waltham, MA.
- 2013 **Outstanding Presentation Award**, American Chemical Society,
 Division of Polymer Chemistry, Western Regional Meeting, Santa Clara, CA.
- 2012 **Graduate Student Award for Excellence in Research**, Department of Materials Science &
 Engineering, The University of Tennessee. *Presented to two students annually.*
- 2011 **Chancellor's Honors for Extraordinary Professional Promise**, The University of Tennessee.
 One graduate student in the department was chosen based on achievements in research.
- 2010 **Travel Award**, 8th National Graduate Research Polymer Conference, Chapel Hill, NC.
- 2010 **Honorable Mention**, the Student Travel Achievement Recognitions (STARs) awards,
 2010 Annual Meeting of Society for Biomaterials, Seattle, WA

- 2009 **First Prize Poster Presentation**, Society of Plastic Engineers, Smoky Mountain Section, Knoxville, TN.
- 2008 **Outstanding Thesis Award for Bachelor's Degree**, Zhejiang University.
- 2007 **First Prize of Research and Innovation Scholarship**, Zhejiang University.

JOURNAL PUBLICATIONS (Total citations: 400+, h-index: 15)

32. Cai L, Dewi RE, Heilshorn SC. Injectable hydrogels with in situ double network formation enhance retention of transplanted stem cells. *Advanced Functional Materials* 2015, 25, 1344-1351. (**Inside Front Cover**)
31. Wang S, Kempen DHR, de Ruiter GCW, Cai L, Spinner RL, Windebank AJ, Yaszemski MJ, Lu L. Molecularly engineered biodegradable polymer networks with a wide range of stiffness for bone and peripheral nerve regeneration. *Advanced Functional Materials* 2015, in press.
30. Henry MG*, Cai L*, Liu X, Zhang L, Dong J, Chen L, Wang Z, Wang S. Roles of hydroxyapatite allocation and microgroove dimension in promoting preosteoblastic cell functions on photocured polymer nanocomposites through nuclear distribution and alignment. *Langmuir* 2015, 31, 2851-2860. (* equal contribution)
29. Wang H, Cai L, Paul A, Enejder A, Heilshorn SC. Hybrid elastin-like polypeptide-polyethylene glycol (ELP-PEG) hydrogels with improved transparency and independent control of matrix mechanics and cell ligand density. *Biomacromolecules* 2014, 15, 3421-3428.
28. Mulyasmita W, Cai L, Dewi RE, Jha A, Ullmann SD, Luong RH, Huang NF, Heilshorn SC. Avidity-controlled hydrogels for injectable co-delivery of induced pluripotent stem cell-derived endothelial cells and growth factors. *Journal of Controlled Release* 2014, 191, 71-81.
27. Cai L, Dinh CB, Heilshorn SC. One-pot synthesis of elastin-like polypeptide hydrogels with grafted VEGF-mimetic peptides. *Biomaterials Science* 2014, 2, 757-765.
26. Cai L, Heilshorn SC. Designing ECM-mimetic materials using protein engineering. *Acta Biomaterialia* 2014, 10, 1751-1760.
25. Mulyasmita W, Cai L, Hori Y, Heilshorn SC. Avidity-controlled delivery of angiogenic peptides from injectable molecular-recognition hydrogels. *Tissue Engineering Part A* 2014, 20, 2102-2114.
24. Cai L, Foster CJ, Wang S. Enhanced bone cell functions on poly(ϵ -caprolactone) triacrylate networks grafted with polyhedral oligomeric silsesquioxane nanocages. *Polymer* 2014, 55, 3836-3845.
23. Cai L, Chen J, Rondinone A, Wang S. Injectable and biodegradable nanohybrid polymers with simultaneously enhanced stiffness and toughness for bone repair. *Advanced Functional Materials* 2012, 22, 3181-3190. (**Feature Article**)
22. Cai L, Zhang L, Dong J, Wang S. Photocured biodegradable polymer substrates of varying stiffness and microgroove dimensions for promoting nerve cell guidance and differentiation. *Langmuir* 2012, 28, 12557-12568.
21. Cai L, Lu J, Sheen V, Wang S. Optimal poly(L-lysine) grafting density in hydrogels for promoting neural progenitor cell functions. *Biomacromolecules* 2012, 13, 1663-1674.
20. Wang K, Cai L, Zhang L, Dong J, Wang S. Biodegradable elastomeric substrates with concentric microgrooves for regulating MC3T3-E1 cell behavior. *Advanced Healthcare Materials* 2012, 1, 292-301.
19. Wei C, Cai L, Sonawane B, Wang S, Dong J. High-precision flexible fabrication of tissue engineering scaffolds using distinct polymers. *Biofabrication* 2012, 4, 025009.

18. Wang K, Cai L, Jesse S, Wang S. Poly(ϵ -caprolactone) banded spherulites and interaction with MC3T3-E1 cells. *Langmuir* 2012, 28, 4382-4395.
17. Cai L, Lu J, Sheen V, Wang S. Promoting nerve cell functions on hydrogels grafted with poly(l-lysine). *Biomacromolecules* 2012, 13, 342-349.
16. Cai L, Lu J, Sheen V, Wang S. Lubricated biodegradable polymer networks for regulating nerve cell behavior and fabricating nerve conduits with a compositional gradient. *Biomacromolecules* 2012, 13, 358-368.
15. Cai L, Guinn AS, Wang S. Exposed hydroxyapatite particles on the surface of photo-crosslinked nanocomposites for promoting MC3T3 cell proliferation and differentiation. *Acta Biomaterialia* 2011, 7, 2185-2199.
14. Wang K, Cai L, Wang S. Methacryl-polyhedral oligomeric silsesquioxane as a crosslinker for expediting photo-crosslinking of poly(propylene fumarate): material properties and bone cell behavior. *Polymer* 2011, 52, 2827-2839. **(Top 25 Hottest Articles in Polymer)**
13. Cai L, Wang S. Parabolic dependence of material properties and cell behavior on the composition of polymer networks via simultaneously controlling crosslinking density and crystallinity. *Biomaterials* 2010, 31, 7423-7434.
12. Cai L, Wang K, Wang S. Poly(ethylene glycol)-grafted poly(propylene fumarate) networks and parabolic dependence of MC3T3 cell behavior on the network composition. *Biomaterials* 2010, 31, 4457-4466.
11. Cai L, Wang S. Poly(ϵ -caprolactone) acrylates synthesized using a facile method for fabricating networks to achieve controllable physicochemical properties and tunable cell responses. *Polymer* 2010, 51, 164-177.
10. Cai L, Wang S. Elucidating colorization in the functionalization of hydroxyl-containing polymers using unsaturated anhydrides/acyl chlorides in the presence of triethylamine. *Biomacromolecules* 2010, 11, 304-307.
9. Wang K, Cai L, Hao F, Xu X, Cui M, Wang S. Distinct cell responses to substrates consisting of poly(ϵ -caprolactone) and poly(propylene fumarate) in the presence or absence of crosslinks. *Biomacromolecules* 2010, 11, 2748-2759.
8. Wang S, Cai L. Polymers for Fabricating Nerve Conduits. *International Journal of Polymer Science*, 2010, Article ID 138686, 20 pages.
7. Wang ZK, Hu QL, Cai L. Chitosan and multi-walled carbon nanotube composite rods. *Chinese Journal of Polymer Science* 2010, 28, 801-806.
6. Zhang K, Zhao M, Cai L, Wang ZK, Sun YF, Hu QL. Preparation of chitosan/hydroxyapatite guided membrane used for periodontal tissue regeneration. *Chinese Journal of Polymer Science* 2010, 28, 555-561.
5. Wang ZK, Hu QL, Cai L. Chitin fiber and chitosan 3D composite rods. *International Journal of Polymer Science* 2010, Article ID 369759, 7 Pages.
4. Dong C, Xu JH, Cai L, Hu QL, Lin J. Study on the absorbable guided chitosan medicine membrane. *Rare Metal Materials and Engineering* 2008, 37, 678-81.
3. Zhang LS, Wang Q, Lei P, Wang X, Wang CY, Cai L. Multiblock poly(4-vinylpyridine) and its copolymer prepared with cyclic trithiocarbonate as a reversible addition-fragmentation transfer agent. *Journal of Polymer Science: Part A: Polymer Chemistry* 2007, 45, 2617-2623.

2. Cai L, Zhu LG. Diaqua(1,10-phenanthroline)(3-sulfonatobenzoato)copper(II) monohydrate. *Acta Crystallographica Section E: Structure Reports* 2005, *E61*, m2184-m2186.
1. Cai L, Xiao HP, Zhu LG. Bis(2,2-bipyridine-N,N)chlorocopper(II) 3-carboxybenzenesulfonate trihydrate, *Acta Crystallographica Section E: Structure Reports* 2005, *E61*, m2546-m2547.

BOOK CHAPTERS

1. Wang S, Cai L. Polymer gel systems for nerve repair and regeneration. In *Biomaterials*, A. S. Kulshrestha, A. Mahapatro, L. A. Henderson Eds. **ACS Symposium Series**, American Chemical Society: Washington DC, 2010, Chapter 3, pp. 43-63.

PATENT

1. Heilshorn SC, Mulyasasmita W, Cai L. Hetero-assembling, Tunable, and Injectable Hydrogels for Cell Encapsulation. Patent Application # 61/989577. Assignee(s): The Board of Trustees of the Leland Stanford Junior University

GRANTSMANSHIP

Ruth L. Kirschstein NIH NRSA Postdoctoral Fellowship to Lei Cai, for 2015-2017, funded by National Heart, Lung, and Blood Institute, \$110,236.

Stanford Neurosciences Institute Interdisciplinary Scholars Award to Lei Cai, for 2015-2016, \$152,000.

California Institute for Regenerative Medicine (CIRM) Grant, written with Giles Plant (Stanford Neurosurgery) and Sarah Heilshorn, awarded for 2015-2017, \$1,452,708.

Stanford Institute for Chemistry, Engineering & Medicine for Human Health (ChEM-H) Grant, written with Ngan Huang (Stanford Cardiothoracic Surgery) and Sarah Heilshorn, awarded for 2014-2016, \$250,000.

Stanford Coulter Foundation Grant, written with Giles Plant (Stanford Neurosurgery) and Sarah Heilshorn, awarded for 2014-2015, \$100,000.

National Institutes of Health, R21 grant submitted to National Institute of Biomedical Imaging and Bioengineering, written with Ngan Huang (Stanford Cardiothoracic Surgery) and Sarah Heilshorn, awarded for 2015-2017, \$250,000.

Stanford Scientific Management Series, Stanford Future Faculty Seminar, 2013

- *Attended quarter long classes with weekly sessions on grant-writing, funding agencies, fiscal and lab management, and setting strategic research plans*
- *Discussed most critical aspects in effectively directing and managing a research lab*

INVITED PRESENTATIONS

6. Injectable hydrogels with in situ double network formation to enhance retention of transplanted stem cells. *Department of Bioengineering Retreat*, Pacific Grove, CA, November 22, 2014.
5. Avidity-controlled hydrogels for delivery of induced pluripotent stem cell-derived endothelial cells and growth factors. *Stanford Chalmers Workshop on Advancing Materials Innovatively*, Stanford, CA, November 14, 2014.
4. Injectable hydrogels for cell transplantation. *Stanford Chalmers Workshop on Advancing Materials*

Innovatively, Gothenburg, Sweden, December 12, 2013.

3. Regulating nerve cell fate on biodegradable polymer networks. *Graduate Student Seminar*, Department of Materials Science & Engineering, The University of Tennessee, January 31, 2012.
2. Poly(ethylene glycol)-grafted poly(propylene fumarate) networks for regulating surface physicochemical characteristics and MC3T3 cell behavior. *Biomaterials Day Symposium* for “Advances in Bioactive Materials and Interfaces for Therapeutics and Diagnostics” sponsored by University of Kentucky and Case Western Reserve University, Lexington, KY, September 25, 2009.
1. Material design strategies for bone and nerve regeneration: controlled physical properties and regulated cell responses. *Comparative & Experimental Medicine and Public Health Research Symposium*, Knoxville, TN, June 16, 2009.

TEACHING & MENTORING EXPERIENCE

Guest Lecturer, Stanford University, Winter 2013 and Spring 2014

- Presented a lecture on protein-engineered biomaterials to a graduate course (50 students)
- Presented a lecture on microstructure of block copolymers to a graduate course (60 students)
- Presented a lecture on electrochemistry to an undergraduate engineering course (60 students)

Co-Instructor, Stanford Summer Engineering Academy, Materials Science and Engineering Module 2014

- Co-developed lecture on materials science with SCH for incoming freshmen
- Designed, organized, and led group experiments demonstrating polymer physics

Teaching Assistant, The University of Tennessee, Fall 2010 and Fall 2011

- Held weekly office hours and graded homework for Introduction to Materials Science Engineering
- Led weekly lab, held weekly office hours, graded homework, and proctored and graded exams for the graduate course Polymer Engineering II

Postdoctoral Mentor to 2 student researchers, Stanford University: Ph.D. student Huiyuan Wang (Materials Science) and undergraduate student Cong Dinh (Materials Science)

- Meet daily with them, brainstorm project ideas, guide paper reading and analysis skills
- Promote critical-thinking skills through discussion
- Demonstrate experimental techniques, data analysis, and trouble-shooting skills
- Resulted in their co-authorship on two manuscripts
- Resulted in external grant for undergraduate research from Sigma Xi Honor Society

Graduate Advisor to 6 student researchers, The University of Tennessee: 1 Ph.D. student (Materials Science), 2 undergraduate students (Materials Science), and 3 high school summer students

- Met with them three days each week
- Provided mentorship on project design, implementation, and problem-solving skills
- Resulted in their co-authorship on two manuscripts and two others in preparation

Mentoring for Academic Science and Beyond, Two-Day Workshop, Stanford, 2013

- Explored my own learning and teaching styles and how it impacts mentoring
- Improved personal mentorship skills through open discussion with peers and faculty mentors
- Analyzed case studies to learn about common issues and challenges around mentoring

Teaching Workshop for Postdocs, Two-Day Workshop, Stanford, 2013

- Learned and used a 7-component educational framework to analyze teaching strategies
- Participated in a forum for collegial exchange about teaching

PROFESSIONAL SERVICE AND AFFILIATIONS

Chemistry Ambassador, American Chemical Society (ACS), since 2012

- *Helped tutor pupils about the importance of chemists and chemistry*
- *Took part in community activities such as open houses and family science nights*

Departmental Service, The University of Tennessee, 2009-2012

- *Met with prospective students and helped with student orientation*
- *Maintained departmental instruments (rheometers, plastic extruders, viscometer, dynamic mechanical analyzer) for a diverse user-base*

Peer Reviewer: (Total times: 30+)

Journal (times): International Journal of Polymer Science (10), Journal of Nanomaterials (6), Acta Biomaterialia (4, **Outstanding Reviewer Award 2014**), Colloids and Surfaces B: Biointerfaces (3), Biomaterials (3), Journal of Analytical Atomic Spectrometry (2), Toxicology Research (2), Biomedical Materials (2), Dental Materials (1), Journal of Biomaterial Science: Polymer Edition (1), Journal of Biotechnology and Biomaterial (1), Biofabrication (1), Journal of Physics Condensed Matter (1)

American Chemical Society (ACS), Member

Society for Biomaterials (SFB), Member

Tissue Engineering and Regenerative Medicine International Society (TERMIS), Member

Biomedical Engineering Society (BMES), Member

American Institute for Chemical Engineers (AIChE), Member

Materials Research Society (MRS), Member

Stanford Cardiovascular Institute, Member

Stanford Neurosciences Institute, Member

CONFERENCE PROCEEDINGS AND ABSTRACTS

51. Cai L, Dewi RE, Heilshorn SC. Injectable hydrogels with in situ double-network formation for cell transplantation. *2014 AIChE Annual Meeting*, Atlanta, GA, United States, November 16-21, 2014.
50. Cai L, Mulyasmita W, Dewi RE, Jha A, Ullmann SD, Luong RH, Huang NF, Heilshorn SC. Avidity-controlled hydrogels for delivery of induced pluripotent stem cell-derived endothelial cells and growth factors. *2014 AIChE Annual Meeting*, Atlanta, GA, United States, November 16-21, 2014.
49. Cai L, Heilshorn SC. Design of Injectable Hydrogels for Regenerative Medicine. *2014 AIChE Annual Meeting*, Atlanta, GA, United States, November 16-21, 2014.
48. Cai L, Heilshorn SC. Injectable hydrogels with in situ double network formation for cell transplantation. *248th American Chemical Society National Meeting*, San Francisco, CA, United States, August 10-14, 2014.
47. Cai L, Heilshorn SC. Design of injectable hydrogels to enhance stem cell transplantation. *Gordon Research Conference on Signal Transduction by Engineered Extracellular Matrices*, Waltham, MA, United States, July 6-11, 2014. (**Best Poster Award**)
46. Cai L, Dinh CB, Heilshorn SC. Elastin-like polypeptide hydrogels with grafted VEGF-mimetic peptides for enhanced endothelial cell function. *44th American Chemical Society, Western Regional Meeting*, Santa Clara, CA, United States, October 3-6, 2013. (**Outstanding Presentation Award**)
45. Dinh CB, Cai L, Heilshorn SC. One-step conjugation of bioactive peptides to elastin-like hydrogels to form tunable tissue engineering scaffolds. *44th American Chemical Society, Western Regional*

Meeting, Santa Clara, CA, United States, October 3-6, 2013.

44. Wang HY, Cai L, Paul A, Enejder A, Heilshorn SC. Hybrid elastin-like polypeptide-polyethylene glycol hydrogels with improved transparency for three-dimensional cell culture. *44th American Chemical Society, Western Regional Meeting*, Santa Clara, CA, United States, October 3-6, 2013.
43. Cai L, Wang S. Tuning nerve cell functions on distinct polymer networks with controllable mechanical properties. *NeuroNET Fall Retreat*, Knoxville, TN, United States, October 29, 2012.
42. Cai L, Lu J, Sheen V, Wang S. Optimal poly(L-lysine) grafting density in hydrogels for promoting neural progenitor cell functions. *NeuroNET Fall Retreat*, Knoxville, TN, United States, October 29, 2012.
41. Foster CJ, Cai L, Wang S. Enhanced bone cell functions on poly(ϵ -caprolactone) triacrylate networks toughened by incorporating photo-crosslinkable polyhedral oligomeric silsesquioxane. *Oak Ridge Chapter of ASM International and Smoky Mountain Section of the Society of Plastic Engineers Research Poster Presentations*, October 18, 2012, Knoxville, TN, United States. (**Best Poster Award to the mentored undergraduate student**)
40. Cai L, Wang S. Tuning nerve cell functions on distinct polymer networks with controllable mechanical properties. *Biomaterials Day Symposium*, Lexington, Kentucky, September 22, 2012 .
39. Cai L, Lu J, Sheen V, Wang S. Optimal poly(L-lysine) grafting density in hydrogels for promoting neural progenitor cell functions. *POLY 2012*, 244, 211. *244th American Chemical Society, National Meeting*, Philadelphia , PA, United States, August 19-23, 2012.
38. Cai L, Wang S. Modulating nerve cell functions on polymer networks with distinct structures and controllable mechanical properties. *Proceedings of the ASME 2012 Summer Bioengineering Conference*, Fajardo, Puerto Rico, June 20-23, 2012.
37. Cai L, Wang S. Thickness sensing of nerve cells on hydrophobic polymer networks with distinct mechanical properties. *Proceedings of the ASME 2012 Summer Bioengineering Conference*, Fajardo, Puerto Rico, June 20-23, 2012.
36. Cai L, Wang S. Modulating nerve cell functions on polymer networks with distinct structures and controllable mechanical properties. *POLY 2012*, 243, 392. (*243th American Chemical Society National Meeting*, San Diego, CA, United States, March 25-29, 2012).
35. Cai L, Wang S. Thickness sensing of nerve cells on hydrophobic polymer networks with distinct mechanical properties. *POLY 2012*, 243, 159. (*243th American Chemical Society National Meeting*, San Diego, CA, United States, March 25-29, 2012).
34. Liu X, Cai L, Wang S. Smooth muscle cell behavior on poly(ϵ -caprolactone) triacrylate networks grafted with poly(ethylene glycol). *POLY 2012*, 243, 458. (*243th American Chemical Society National Meeting*, San Diego, CA, United States, March 25-29, 2012).
33. Cai L, Wang S. Poly(propylene fumarate)-co-polyhedral oligomeric silsesquioxane for bone repair: enhanced fracture toughness and MC3T3-E1 cell functions. *PMSE 2011*, 105, 915. (*242th American Chemical Society National Meeting*, Denver, CO, United States, August 28-September 1, 2011)
32. Cai L, Wang S. Poly(ethylene glycol)-grafted poly(propylene fumarate) networks and parabolic dependence of MC3T3 cell behavior on the network composition. *PMSE 2011*, 105, 913. (*242th American Chemical Society National Meeting*, Denver, CO, United States, August 28-September 1, 2011)
31. Cai L, Wang S. Poly(ethylene glycol)-tethered biodegradable elastomers for tuning surface characteristics and nerve cell behavior. *PMSE 2011*, 105, 824. (*242th American Chemical Society National Meeting*, Denver, CO, United States, August 28-September 1, 2011)

30. Cai L, Zhang L, Dong J, Wang S. Biodegradable elastomeric substrates with micro-fabricated grooves for promoting neurite extension. *PMSE 2011*, 105, 818. (242th American Chemical Society National Meeting, Denver, CO, United States, August 28-September 1, 2011)
29. Liu X, Cai L, Hao F, Cui M, Wang S. Biodegradable elastomeric substrates with controllable stiffness for regulating smooth muscle cell behavior. *PMSE 2011*, 105, 838. (242th American Chemical Society National Meeting, Denver, CO, United States, August 28-September 1, 2011)
28. Wang K, Cai L, Zhang L, Dong J, Wang S. Biodegradable elastomeric substrates with concentric microgrooves for regulating MC3T3 cell behavior. *PMSE 2011*, 105, 830. (242th American Chemical Society National Meeting, Denver, CO, United States, August 28-September 1, 2011)
27. Cai L, Wang S. Enhanced nerve cell proliferation and differentiation using hydrogels grafted with photo-polymerizable poly-L-lysine. *Society for Biomaterials 2011 Annual Meeting and Exposition*, April 13-16, Orlando, FL, United States, 2011.
26. Cai L, Wang S. Exposed hydroxyapatite particles on the surface of photo-crosslinked nanocomposites and promoted MC3T3 cell function. *Society for Biomaterials 2011 Annual Meeting and Exposition*, April 13-16, Orlando, FL, United States, 2011.
25. Cai L, Zhang L, Dong J, Wang S. Biodegradable elastomeric substrates with micro-fabricated grooves for promoting neurite extension. *Society for Biomaterials 2011 Annual Meeting and Exposition*, April 13-16, Orlando, FL, United States, 2011.
24. Cai L, Wang S. Poly(ethylene glycol)-tethered biodegradable elastomers for regulating surface characteristics and nerve cell behavior. *Society for Biomaterials 2011 Annual Meeting and Exposition*, April 13-16, Orlando, FL, United States, 2011.
23. Liu X, Cai L, Wang S. Regulation of smooth muscle cell behavior on novel biodegradable elastomeric substrates with controllable stiffness. *Society for Biomaterials 2011 Annual Meeting and Exposition*, April 13-16, Orlando, FL, United States, 2011.
22. Wang K, Cai L, Zhang L, Dong J, Wang S. Biodegradable elastomeric substrates with concentric microgrooves for regulating MC3T3 cell behavior. *Society for Biomaterials 2011 Annual Meeting and Exposition*, April 13-16, Orlando, FL, United States, 2011.
21. Liu X, Cai L, Wang S. Regulation of smooth muscle cell behavior on novel biodegradable elastomeric substrates with controllable stiffness. *Oak Ridge Chapter of ASM International and Smoky Mountain Section of the Society of Plastic Engineers*, Knoxville, TN, United States, November 18, 2010. (**Awarded as the Best Poster in SPE section**)
20. Cai L, Wang S. Modulation of nerve cell behavior using biodegradable elastomeric substrates. *Oak Ridge Chapter of ASM International and Smoky Mountain Section of the Society of Plastic Engineers*, Knoxville, TN, United States, November 18, 2010.
19. Wei C, Sonawane B, Cai L, Wang S, Dong J. Direct-deposition and multiple materials integration of tissue engineering scaffolds. *ASME 2010 International Mechanical Engineering Congress and Exposition*, Vancouver, BC, Canada, November 12-18, 2010.
18. Wang K, Cai L, Wang S. Poly(ϵ -caprolactone) and its homo-blends: Regulated material properties and cell responses. *PMSE-345*, 240th American Chemical Society National Meeting, Boston, MA, United States, August 22-26, 2010.
17. Cai L, Wang S. Enhanced PC12 cell responses to polyethylene glycol diacrylate-based hydrogels grafted with photo-polymerizable poly-L-lysine. *PMSE-341*, 240th American Chemical Society National Meeting, Boston, MA, United States, August 22-26, 2010.
16. Cai L, Wang S. Exposed hydroxyapatite (HA) particles on the surface of photo-crosslinked

- poly(ϵ -caprolactone)/HA nanocomposites and promoted MC3T3 cell responses. PMSE-329, *240th American Chemical Society National Meeting*, Boston, MA, United States, August 22-26, 2010.
15. Wang K, Cai L, Wang S. Rheological properties of poly(ϵ -caprolactone) and its homo-blends. PMSE-283, *240th American Chemical Society National Meeting*, Boston, MA, United States, August 22-26, 2010.
 14. Cai L, Wang S. Enhanced nerve cell attachment, proliferation, and differentiation on hydrogels grafted with photo-polymerizable poly-L-lysine. *Comparative & Experimental Medicine and Public Health Research Symposium*, The University of Tennessee, Knoxville, TN, United States, June 14-15, 2010.
 13. Cai L, Wang S. Enhanced nerve cell attachment, proliferation, and differentiation on hydrogels grafted with poly-L-lysine. *8th National Graduate Research Polymer Conference*, Chapel Hill, NC, United States, June 6 - 9, 2010. (**Travel Award**)
 12. Wang S, Cai L, Wang K. Polymeric biomaterials for regulating cell behavior. *Symposium of "Frontiers in Polymer Chemistry" for Prof. R. P. Quirk's Retirement*, The University of Akron, Akron, OH, United States, May 13-14, 2010.
 11. Cai L, Wang S. Poly(ethylene glycol)-grafted poly(propylene fumarate) networks for regulating surface physicochemical characteristics and MC3T3 cell behavior. *Society for Biomaterials 2010 Annual Meeting and Exposition*, April 21-24, Seattle, WA, United States, 2010. (**Awarded as STAR Honorable Mention**)
 10. Cai L, Wang S. Roles of crosslinking density and crystallinity in tuning injectable biomaterial properties and cell responses. *Society for Biomaterials 2010 Annual Meeting and Exposition*, April 21-24, Seattle, WA, United States, 2010.
 9. Wang K, Cai L, Wang S. Regulated cell responses using the blends of poly(propylene fumarate) and poly(ϵ -caprolactone). *Society for Biomaterials 2010 Annual Meeting and Exposition*, April 21-24, Seattle, WA, United States, 2010.
 8. Cai L, Wang S. Roles of crosslinking density and crystallinity in tuning injectable biomaterial properties. *Oak Ridge Chapter of ASM International and Smoky Mountain Section of the Society of Plastic Engineers*, Knoxville, TN, United States, November 19, 2009. (**Awarded as the Best Poster in SPE section**)
 7. Wang K, Cai L, Wang S. Poly(ϵ -caprolactone) homo-blends: Regulated materials properties and cell responses. *AIChE 2009 Fall Annual Meeting*, Nashville, TN, United States, November 8-13, 2009.
 6. Cai L, Wang S. Injectable poly(ϵ -caprolactone acrylate)s synthesized using a facile route for regulating material properties and cell responses. *AIChE 2009 Fall Annual Meeting*, Nashville, TN, United States, November 8-13, 2009.
 5. Cai L, Wang S. Materials design strategies for bone and nerve regeneration: Controlled physical properties and regulated cell responses. *Biomaterials Day Symposium* for "Advances in Bioactive Materials and Interfaces for Therapeutics and Diagnostics" sponsored by University of Kentucky and Case Western Reserve University, Lexington, KY, United States, September 25, 2009.
 4. Cai L, Wang S. Poly(ethylene glycol)-grafted poly(propylene fumarate) networks for regulating surface physicochemical characteristics and MC3T3 cell behavior. *Biomaterials Day Symposium* for "Advances in Bioactive Materials and Interfaces for Therapeutics and Diagnostics" sponsored by University of Kentucky and Case Western Reserve University, Lexington, KY, United States, September 25, 2009.
 3. Cai L, Wang S. Roles of crosslinking density and crystallinity in tuning injectable biomaterial properties. *PMSE Preprints 2009*, 101, 1557-1558. (PMSE-437, *238th American Chemical Society*)

National Meeting, Washington, DC, United States, August 16-20, 2009)

2. Cai L, Wang S. Photocrosslinkable polycaprolactone diacrylates and triacrylates: A facile synthetic method and material properties. *PMSE Preprints 2009*, 101, 1423-1424. (PMSE-361, 238th *American Chemical Society National Meeting, Washington, DC, United States, August 16-20, 2009)*
1. Cai L, Wang S. Materials design strategies for bone and nerve regeneration: controlled physical properties and regulated cell responses. *Comparative & Experimental Medicine and Public Health Research Symposium, The University of Tennessee, Knoxville, TN, United States, June 15-16, 2009.*