

Curriculum Vitae

ZHEN GU, PH.D.

Associate Professor (Tenured)

Joint Department of Biomedical Engineering

University of North Carolina at Chapel Hill | North Carolina State University

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POSITIONS AND EMPLOYMENT

- **Founding Director** 2016-
Biomedical Engineering Translational Innovation (BME-Train) Professional Science Master Program
University of North Carolina at Chapel Hill | North Carolina State University
- **Associate Professor** 2016-
Joint Department of Biomedical Engineering, Pharmacoengineering Program
University of North Carolina at Chapel Hill | North Carolina State University
- **Joint Associate Professor** 2016-
Division of Molecular Pharmaceutics and Center for Nanotechnology in Drug Delivery
Eshelman School of Pharmacy, University of North Carolina at Chapel Hill
- **Joint Associate Professor** 2016-
Department of Medicine, Division of Endocrinology and Metabolism
University of North Carolina at Chapel Hill
- **Assistant Professor** 2012-2016
Joint Department of Biomedical Engineering, Pharmacoengineering Program
University of North Carolina at Chapel Hill | North Carolina State University
- **Joint Assistant Professor** 2012-2016
Division of Molecular Pharmaceutics and Center for Nanotechnology in Drug Delivery
Eshelman School of Pharmacy, University of North Carolina at Chapel Hill
- **Joint Assistant Professor** 2015-2016
Department of Medicine, Division of Endocrinology and Metabolism
University of North Carolina at Chapel Hill

EDUCATION AND TRAINING

- **Massachusetts Institute of Technology (MIT) | Harvard Medical School (HMS)** Cambridge, MA
Postdoctoral Fellow, Advisor: Robert S. Langer 2010-2012
Koch Institute for Integrative Cancer Research, Department of Chemical Engineering, MIT
Children's Hospital Boston, HMS
- **University of California, Los Angeles (UCLA)** Los Angeles, CA
Ph.D, Chemical and Biomolecular Engineering / Nanobiotechnology, Advisor: Yi Tang 2006-2010
Department of Chemical and Biomolecular Engineering | Department of Mechanical and Aerospace Engineering
School of Engineering and Applied Science
- **Nanjing University (NJU)** Nanjing, China
M.S., Polymer Chemistry and Physics, Advisor: Qundong Shen 2003-2006
Department of Polymer Science and Engineering, School of Chemistry and Chemical Engineering
- **Nanjing University (NJU)** Nanjing, China
B.S., Chemistry, Advisors: Qundong Shen | Changzheng Yang 1999-2003
Department of Chemistry, School of Chemistry and Chemical Engineering

HONORS AND AWARDS

- Young Investigator Award, Controlled Release Society (CRS), 2017
- Research Achievement Award, ALCOA Foundation, 2017
- Jackson Family Endowed Chair Professorship, 2017
- Annual Health Care Hero, Triangle Business Journal, 2017
- Runner-up of APEC Science Prize for Innovation, Research, and Education (ASPIRE) Competition, U.S. Dept. State, 2017
- National Academy of Engineering (NAE) Frontiers in Engineering Invitee, 2016
- University Faculty Scholar Award, NC State, 2016

- Sloan Research Fellow, Alfred P. Sloan Foundation, 2016
- GOOD 100- “100 Global Creative Individuals”, *GOOD Magazine*, 2016
- NC TraCS 4D (Drugs, Devices and Diagnostics Development) Research Award, 2016
- TR35-Global Top Innovator under 35 (Pioneer in Biomedicine and Materials), MIT Technology Review, 2015
- Top 10 Science Images in *Science Magazine*, 2015
- ACCLAIM Fellow, Program of Academic Career Leadership Academy in Medicine at UNC, 2015
- Young Innovator Award of Cellular and Molecular Bioengineering (CMBE), Biomedical Engineering Society (BMES), 2015
- The First Prize of Surgery-Engineering Speed Dating Award, UNC, 2015
- “Young Talents in Polymer Science” Highlight, *Macromolecular Chemistry and Physics*, 2015
- Pathway Award, American Diabetes Association, 2015
- Young Faculty Research Award, Sigma Xi Chapter of the Scientific Research Society, 2014
- Junior Faculty Award, American Diabetes Association, 2014
- NC State Research Innovative Award, 2013, 2015
- NC TraCS \$50K Translational Science Pilot Award, UNC, 2013, 2015
- NC State Faculty Research and Professional Development Award, 2013
- Specially-Appointed Full Professor in Jiangsu Province-Nanjing University, China, 2012 (relinquished)
- Excellent Publication Award of Key Laboratory of Mesoscopic Chemistry, China, 2011
- Chinese Government Award for Outstanding Ph.D. Students Abroad, Los Angeles, 2010
- Fellowship of “Functional Engineered Nano Architectonics” (FENA), UCLA, 2008
- Distinguished Graduate Student, NJU, 2006
- Finalist for DSM Business Course-“2006-ZHUO”, Shanghai, 2006
- Scholarship of National Distinguished Graduate Student, China, 2005
- Dai An-Bang Scholarship for Excellent Experimental Abilities, China, 2003
- Distinguished Youth Leadership Award in Jiangsu Province, China, 2003
- Distinguished Model Student of NJU, 2002
- GuangHua Scholarship for Outstanding Undergraduate Students, China, 2002
- The First Prize of People’s Scholarship for Distinguished Students in NJU, 2002
- The First Prize of People’s Scholarship for Distinguished Students in NJU, 2001
- The First Prize of 6th Academic Paper Competition in NJU, 2001
- The First Prize of 10th Youth Creativity Competition in Jiangsu Province, China, 1999

RESEARCH FOCUS

The Gu research laboratory (Biopolymeric Healthcare Engineering Lab) is focused on exploiting novel materials and strategies that apply stimuli-responsive systems for *precisely* delivering therapeutics in dose-, spatial- and temporal-controlled manners. By accumulating and integrating tools of materials chemistry, biomolecular engineering and micro/nano fabrication, the lab is adapting the concept of “artificial vesicles”, which are inspired by effective approaches found in natural particulates, from viruses to cells. Drug delivery through such vehicles can be specifically regulated by physiological modalities, such as glucose, ATP, enzymes, and reactive oxygen species, the level or activity of which is often closely associated with many diseases, including diabetes and cancer. In particular, the lab is studying polymeric glucose-responsive synthetic formulations and devices for delivering insulin in a self-regulated manner, which mimics the function of pancreatic β -cells. The lab is also developing the “programmed” anticancer drug delivery systems that can respond upon the elements within tumor microenvironment or subcellular environment and sequentially release therapeutics to their most active destinations. In addition to endogenous triggers, the lab is also interested in utilizing exogenous triggers, such as ultrasound and light to achieve spatiotemporal administration.

MEDIA COVERAGE

• NEWS FOR PAPER PUBLICATIONS

TIME, *Washington Post*, *Fox News*, *Reuters*, *The Guardian*, *Daily Mail*, *China Daily*, *The Scientist*, *Science* (Homepage Headline), *Nature* (Homepage Headline; News and View), *Science Translational Medicine*, *Molecular Therapy*, *Materials Today*, *Nano Today*, *C&E News* and *Science Daily* (15 times).

• PERSONAL SPECIFIC HIGHLIGHTS

08/2016 *STAT*, *The Boston Globe*

06/2016 *China Youth*

01/2016 *Results*, *NC State*

12/2015 *China Daily*

10/2015 *NC State Homepage Headline*

09/2015 **Nanjing University Homepage Headline**
 08/2015 **University Gazette (UNC)**
 08/2015 **UNC Homepage Spotlight**
 08/2015 **NC State Homepage Headline**
 08/2015 **University Gazette (UNC)**
 08/2015 **MIT Technology Review (TR35 Innovators List)**
 07/2015 **HigherEducationWorks**
 04/2015 **NC State Engineering Alumni Magazine.**
 01/2015 **News and Observers** (Front Page)
 01/2015 **UNC TraCS**
 11/2014 **HigherEducationWorks** (Homepage)
 11/2014 **NC State Homepage Headline**
 06/2014 **NC State Engineering Alumni Magazine**
 04/2014 **University Gazette (UNC)**
 11/2013 **NC State Engineering Alumni Magazine**
 07/2013 **UNC Endeavors** (Homepage)
 07/2010 **China Scholars**

• COMMENTING FOR OTHERS' RESEARCH

01/2014 **Science News**: Nanopackaging biodegrades after delivering cancer drug (Toronto University - Warren Chan's work published on *Nature Nanotechnology*)
 08/2012 **The Scientist**: Next Generation: In Vivo Drug Factories (MIT- Daniel Anderson's work published on *Nano Letters*)

PUBLICATIONS

• PEER-REVIEWED JOURNAL PAPERS

(*: corresponding author; †: equal contribution)

1. Yue Lu, Alex Aimetti, Robert Langer*, Zhen Gu*, "Bioresponsive Materials", *Nature Reviews Materials*, 1(16075), 2016.
2. Chao Wang, Wujin Sun, Yanqi Ye, Hunter Bomba, Zhen Gu*, "In situ Activation of Platelets with Checkpoint Inhibitors for Post-Surgical Cancer Immunotherapy", *Nature Biomedical Engineering*, 1(0017), 2017.
3. Yue Lu, Quanyin Hu, Yiliang Lin, Dennis B. Pacardo, Chao Wang, Wujin Sun, Frances S. Ligler, Michael D. Dickey, Zhen Gu*, "Transformable Liquid-Metal Nanomedicine", *Nature Communications*, 6(10066), 2015.
4. Jicheng Yu, Yuqi Zhang, Yanqi Ye, Rocco DiSanto, Wujin Sun, Davis Ranson, Frances Ligler, John Buse, Zhen Gu*, "Microneedle-Array Patches Loaded with Hypoxia-Sensitive Vesicles Provide Fast Glucose-Responsive Insulin Delivery", *Proceedings of the National Academy of Sciences U.S.A. (PNAS)*, 112(8260), 2015.
5. Ran Mo, Tianyue Jiang, Rocco DiSanto, Wanyi Tai, Zhen Gu*, "ATP-Triggered Anticancer Drug Delivery" *Nature Communications*, 5(3364), 2014.
6. Wujin Sun, Wenyan Ji, Quanyin Hu, Zhen Gu*, "Leveraging Physiology for Precision Drug Delivery", *Physiological Reviews*, 97(189), 2017.
7. Yuqi Zhang, Jicheng Yu, Hunter Bomba, Yong Zhu, Zhen Gu*, "Mechanical Force-Triggered Drug Delivery", *Chemical Reviews*, 116(19), 2016.
8. Jicheng Yu, Yuqi Zhang, Anna R. Kahkoska, Zhen Gu*, "Bioresponsive Transcutaneous Patches", *Current Opinion in Biotechnology*, in press, 2017
9. Chao Wang, Yanqi Ye, Wujin Sun, Jicheng Yu, Jinqiang Wang, David Lawrence, John Buse, Zhen Gu*, "Red Blood Cells for Glucose-Responsive Insulin Delivery", *Advanced Materials*, in press, 2017.

10. Yuqi Zhang, Jicheng Yu, Jinqiang Wang, Nicholas J. Hanne, Zheng Cui, Chenggen Qian, Chao Wang, Hongliang Xin, Jacqueline H. Cole, Caterina M. Gallippi*, Yong Zhu*, Zhen Gu*, "Thrombin-Responsive Transcutaneous Patch for Auto-Anticoagulant Regulation", **Advanced Materials**, 29(1604043), 2017. **(Cover Feature)**
11. Quanyin Hu, Wujin Sun, Chenggen Qian, Hunter N. Bomba, Hongliang Xin, Zhen Gu*, "Relay Drug Delivery for Amplifying Targeting Signal and Enhancing Anticancer Efficacy", **Advanced Materials**, in press, 2017.
12. Yanqi Ye, Jinqiang Wang, Quanyin Hu, Gabrielle M. Hochu, Hongliang Xin, Chao Wang*, Zhen Gu*, "Synergistically Transcutaneous Immunotherapy Enhances Antitumor Immune Responses through Blockade of PD1 and IDO", **ACS Nano**, 10(8956), 2016.
13. Chao Wang, Yanqi Ye, Quanyin Hu, Adriano Bellotti, Zhen Gu*, "Tailoring Biomaterials for Cancer Immunotherapy: Emerging Trends and Future Outlook", **Advanced Materials**, in press, 2017.
14. Yue Lu, Yiliang Lin, Zhaowei Chen, Yang Liu, Shuangjiang Yu, Wei Gao, Michael D. Dickey, Zhen Gu*, "Enhanced Endosomal Escape by Light-fueled Liquid-metal Transformer", **Nano Letters**, in press, 2017.
15. Xiuli Hu, Yuqi Zhang, Zhigang Xie, Xiabin Jing, Adriano Bellotti, Zhen Gu*, "Stimuli-Responsive Polymersomes for Biomedical Applications", **Biomacromolecules**, in press, 2017. **(Invited Perspective)**
16. Jin Di, Jicheng Yu, Qun Wang, Shanshan Yao, Dingjie Suo, Yanqi Ye, Matthew Pless, Yong Zhu, Yun Jing, Zhen Gu*, "Ultrasound-Triggered Noninvasive Regulation of Blood Glucose Levels Using Microgels Integrated with Insulin Nanocapsules", **Nano Research**, in press, 2017.
17. Chenggen Qian, Jicheng Yu, Yulei Chen, Quanyin Hu, Xuanzhong Xiao, Wujin Sun, Chao Wang, Qun-Dong Shen, Zhen Gu*, "Light-Activated Hypoxia-Responsive Nanocarriers for Enhanced Anticancer Therapy", **Advanced Materials**, 28(3313), 2016. **(Cover Feature)**
18. Yanqi Ye, Jicheng Yu, Chao Wang, Nhu-Y Nguyen, John B. Buse, Zhen Gu*, "Microneedles Integrated with Pancreatic Cells and Synthetic Glucose-Signal Amplifiers for Smart Insulin Delivery", **Advanced Materials**, 28(3115), 2016. **(Cover Feature)**
19. Jicheng Yu, Chenggen Qian, Yuqi Zhang, Zhen Cui, Yong Zhu, Qun-Dong Shen, Frances Ligler, John Buse, Zhen Gu*, "Hypoxia and H₂O₂ Dual-Sensitive Vesicles for Enhanced Glucose-Responsive Insulin Delivery", **Nano Letters**, 17(733), 2017.
20. Chenggen Qian, Peijian Feng, Jicheng Yu, Yulei Chen, Qundong Shen*, Zhen Gu*, "Anaerobe-Inspired Anticancer Nanovesicles", *submitted to **Angewandte Chemie International Edition***, in press, 2017. **(VIP Paper; Cover Feature)**
21. Xiuli Hu, Jicheng Yu, Chenggen Qian, Yue Lu, Anna R. Kahkoska, Zhigang Xie, Xiabin Jing, John B. Buse, Zhen Gu*, "H₂O₂-Responsive Vesicles Integrated with Transcutaneous Patches for Glucose-Mediated Insulin Delivery", **ACS Nano**, 11(613), 2017.
22. Ping'an Ma, Haihua Xiao, Chang Yu, Jianhua Liu, Ziyong Cheng, Haiqin Song, Xinyang Zhang, Chunxia Li, Jinqiang Wang, Zhen Gu*, Jun Lin*, "Enhanced Cisplatin Chemotherapy by Iron Oxide Nanocarriers-Mediated Generation of Highly Toxic Reactive Oxygen Species", **Nano Letters**, in press, 2017.
23. Chao Wang, Wujin Sun, Yanqi Ye, Hunter N. Bomba, Zhen Gu*, "Bioengineering of Artificial Antigen Presenting Cells and Lymphoid Organs", **Theranostics**, in press, 2017.
24. Jicheng Yu, Yuqi Zhang, Wujin Sun, Anna R. Kahkoska, Jinqiang Wang, John B. Buse, Zhen Gu*, "Insulin-Responsive Glucagon Delivery for Prevention of Hypoglycemia", **Small**, in press, 2017. **(Cover Feature)**

25. Chenggen Qian, Yulei Chen, Peijian Feng, Xuanzhong Xiao, Mei Dong, Jicheng Yu, Quanyin Hu, Qundong Shen, Zhen Gu* "Conjugated Polymer Nanomaterials for Theranostics", *Acta Pharmacologica Sinica*, in press, 2017.
26. Chao Wang, Yanqi Ye, Gabrielle M. Hochu, Zhen Gu*, "Enhanced Cancer Immunotherapy by Microneedle Patch-Assisted Delivery of Anti-PD1 Antibody", *Nano Letters*, 16(2334), 2016.
27. Quanyin Hu, Chenggen Qian, Wujin Sun, Jinqiang Wang, Zhaowei Chen, Hunter N. Bomba, Hongliang Xin, Qundong Shen, Zhen Gu*, "Engineered Nano-platelets for Enhanced Treatment of Multiple Myeloma and Thrombus", *Advanced Materials*, 10.1002/adma.201603463, 2016.
28. Quanyin Hu, Wujin Sun, Hunter Bomba, Zhen Gu*, "Tumor Microenvironment-Mediated Construction and Deconstruction of Depots for Enhanced Anticancer Efficacy", *Nano Letters*, 16(1118), 2016.
29. Chao Wang, Wujin Sun, Yanqi Ye, Grace Wright, Andrew Wang, Zhen Gu*, "Transformable DNA Nanocarriers for Membrane Targeted Delivery of Cytokines", *Advanced Materials*, 28(8912), 2016.
30. Dongquan Shi, Xingquan Xu, Yanqi Ye, Kai Song, Yixiang Cheng, Jin Di, Quanyin Hu, Jianxin Li, Huangxian Ju, Qing Jiang*, Zhen Gu*, "Photo-Crosslinked Scaffold with Kartogenin-Encapsulated Nanoparticles for Cartilage Regeneration", *ACS Nano*, 10(1292), 2016.
31. Zhen Gu*, "Introduction to Special Issue- Responsive Materials and Systems", *Bioengineering and Translational Medicine*, in press, 2016. (Editorial)
32. Quanyin Hu, Zhen Gu*, "Engineering Platelet-Mimicking Drug Delivery Vehicles", *Frontiers of Chemical Sciences and Engineering*, in press, 2016.
33. Jicheng Yu, Xiuli Hu, Zhen Gu*, "Stimuli-Responsive Delivery of Therapeutics for Diabetes Treatment", *Bioengineering and Translational Medicine*, 10.1002/btm2.10036, 2016.
34. Wujin Sun, Zhen Gu*, "Tailoring Non-Viral Delivery Vehicles for Transporting Genome-Editing Tools", *Science China Materials*, in press, 2016. (Invited Review)
35. Lingyan Lv, Xin Liu, Baoyan Wang, Yan Jian, Wei Lv, Yue Zhao, Huihui Shi, Quanyin Hu, Hongliang Xin, Qunwei Xu*, Zhen Gu, "Enhanced Antiglioblastoma Efficacy of Neovasculature and Glioma Cells Dual Targeted Nanoparticles", *Molecular Pharmaceutics*, 13(3506), 2016.
36. Xudong Zhang, Xin Liang, Jianjun Gu, Danfeng Chang, Jinjie Zhang, Zhaowei Chen, Yanqi Ye, Chao Wang, Wei Tao, Xiaowei Zeng, Gan Liu, Yongjun Zhang*, Lin Mei*, Zhen Gu*, "Investigation and Intervention of Autophagy to Guide Cancer Treatment with Nanogels", *Nanoscale*, in press, 2016.
37. Chao Wang*, Yanqi Ye, Zhen Gu*, "Local Delivery of Checkpoints Antibodies", *Human Vaccines & Immunotherapeutics*, 10.1080/21645515.2016, 2016
38. Chenggen Qian, Yulei Chen, Sha Zhu, Jicheng Yu, Lei Zhang, Peijian Feng, Xin Tang, Xuanzhong Xiao, Qun-Dong Shen, Zhen Gu*, "ATP-Responsive and Near-Infrared-Emissive Nanocarriers for Anticancer Drug Delivery and Real-Time Imaging", *Theranostics*, 6(1053), 2016.
39. Jicheng Yu, Yuqi Zhang, Xiuli Hu, Wujin Sun, Chao Wang, Yanqi Ye, Zhen Gu*, "Internalized Compartments-Encapsulated Nanogel for Targeted Drug Delivery", *Nanoscale*, 8(9178), 2016.

40. Wujin Sun, Wenyan Ji, Quanyin Hu, Jicheng Yu, Chao Wang, Chenggen Qian, Gabrielle Hochu, Zhen Gu*, "Transformable Nanocarriers for Membrane Targeted Delivery of Cytokines", *Biomaterials*, 96(1), 2016.
41. Yue Zhao, Yan Jiang, Wei Lv, Zhongyuan Wang, Lingyan Lv, Baoyan Wang, Xin Liu, Yang Liu, Quanyin Hu, Wujin Sun, Qunwei Xu, Hongliang Xin*, Zhen Gu, "Dual Targeted Nanocarrier for Brain Ischemic Stroke Treatment", *Journal of Controlled Release*, 233(64), 2016.
42. Wujin Sun, Zhen Gu*, "ATP-Responsive Drug Delivery Systems", *Expert Opinion on Drug Delivery*, 13(311), 2016. (Invited Article)
43. Yuqi Zhang, Yong Zhu*, Zhen Gu*, "Elastic Drug Delivery: could treatments be triggered by patient movement?", *Nanomedicine*, 11(323), 2016.
44. Jicheng Yu, Zhen Gu*, "Hypoxia-Sensitive Materials for Biomedical Applications", *Annals of Biomedical Engineering*. 44(1931), 2016. (Invited Article for special issue on "Biomaterials")
45. Samir Mitragotri*, Daniel G. Anderson, Shawn X. Chen, Edward K. Chow, Dean Ho, Alexander V. Kabanov, Jeffrey M. Karp, Kazunori Kataoka, Chad A. Mirkin, Sarah Hurst. Petrosko, Jinjun Shi, Molly M. Stevens, Shouheng Sun, Sweehin Teoh, Subbu S. Venkatraman, Younan Xia, Shutao Wang, Zhen Gu*, Chenjie Xu*, "Accelerating the Translation of Nanomaterials in Biomedicine", *ACS Nano*, 9(6644), 2015.
46. Quanyin Hu, Chenggen Qian, Yanqi Ye, Chao Wang, Zhen Gu*, "Anticancer Platelet-Mimicking Nanovehicles", submitted to *Advanced Materials*, 27(7043), 2015. (Selected as a VIP Paper; Cover Feature)
47. Wujin Sun, Wenyan Ji, Jordan M. Hall, Quanyin Hu, Chao Wang, Chase L. Beisel, Zhen Gu*, "Efficient Delivery of CRISPR-Cas9 for Genome Editing via Self-Assembled DNA Nanoclews", *Angewandte Chemie International Edition*, 127(12197), 2015. (Selected as a Hot Paper; Cover Feature)
48. Jin Di, Shanshan Yao, Yanqi Ye, Zheng Cui, Jicheng Yu, Tushar K. Ghosh, Young Zhu*, Zhen Gu*, "Stretch-Triggered Drug Delivery from Wearable Elastomer Films Containing Therapeutic Depots", *ACS Nano*, 9(9407), 2015.
49. Ran Mo, Zhen Gu*, "Tumor microenvironment and intracellular signal-activated nanomaterials for anticancer drug delivery", *Materials Today*, 19(274), 2015.
50. Quanyin Hu, Wujin Sun, Zhen Gu*, "Recent advances of cocktail chemotherapy by combination drug delivery systems", *Advanced Drug Delivery Reviews*, 98(19), 2015. (Invited Article)
51. Wujin Sun, Tianyue Jiang, Yue Lu, Margaret Reiff, Ran Mo, Zhen Gu*, "Cocoon-Like Self-Degradable DNA-Nanoclew for Anticancer Drug Delivery", *Journal of the American Chemical Society*, 136(14722), 2014.
52. Muxun Zhao, Yarong Liu, Renee Hsieh, Nova Wang, Kye-Il Joo, Pin Wang, Zhen Gu, Yi Tang*, "Clickable Protein Nanocapsules for Targeted Delivery of Recombinant p53 Protein" *Journal of the American Chemical Society*, 136 (15319), 2014.
53. Ran Mo, Tianyue Jiang, Zhen Gu*, "Enhanced Anticancer Efficacy by ATP-Mediated Liposomal Drug Delivery", *Angewandte Chemie International Edition*, 53(5810), 2014.
54. Wujin Sun, Yue Lu, Zhen Gu*, "Rolling Circle Amplification (RCA) for Engineering Drug Delivery Carriers" *Therapeutic Delivery*, 6(765), 2015.
55. Tianyue Jiang, Wujin Sun, Nancy A. Burns, Saad A. Khan, Ran Mo, Zhen Gu*, "Furin-Mediated Sequential Delivery of Anticancer Cytokine and Small-Molecule Drug Shuttled by Graphene", *Advanced Materials*, 27(1021), 2015. (Cover Feature)

56. Jin Di, Jinwook Kim, Quanyin Hu, Xiaoning Jiang*, Zhen Gu*, "Spatiotemporal Drug Delivery Using Laser-Generated-Focused Ultrasound System", **Journal of Controlled Release**, 220(592), 2015.
57. Xiaohui Li, Jicheng Yu, Naiyan Lu, Weidong Zhang, Zhijun Hu, Yuqiang Ma, Yuyan Weng*, Zhen Gu*, "Confinement-induced Nanocrystals Alignment under the Soft-Stamped Nanoimprint Lithography", **Chinese Physics B**, 24(104215), 2015.
58. Jin Di*, Jicheng Yu*, Yanqi Ye, Davis Ranson, Abby Jindal, Zhen Gu*, "Engineering Synthetic Insulin-Secreting Cells Using Hyaluronic Acid Microgels Integrated with Glucose-Responsive Nanoparticles" **Cellular and Molecular Bioengineering**, 8(445), 2015. (Cover Feature; Young Innovators Special Issue).
59. Yanqi Ye, Jicheng Yu, Zhen Gu*, "In Situ Preparation of Stimuli-Responsive Protein Nanogels", **Macromolecular Chemistry and Physics**, 217(333), 2015. (Invited Article; "Young Talents in Polymer Science" Specific Issue)
60. Dennis B. Pacardo, Bhanu Neupane, S. Michaela Rikard, Yue Lu, Ran Mo, Sumeet R. Mishra, Joseph B. Tracy, Gufeng Wang, Frances S. Ligler* and Zhen Gu*, "A dual wavelength-activatable gold nanorod complex for synergistic cancer treatment", **Nanoscale**, 7(12096), 2015.
61. Wenyang Ji, Wujin Sun, Jinmei Feng, Tianshun Song, Dalu Zhang, Pingkai Ouyang, Zhen Gu, Jingjing Xie*, "Characterization of a Novel N-Acetylneuraminic Acid Lyase Favoring N-Acetylneuraminic Acid Aynthesis", **Scientific Reports**, 5(9341), 2015.
62. Bingxi Yan, Boyi Li, Forest Kunecke, Zhen Gu, Liang Guo*, "Polypyrrole-Based Implantable Electroactive Pump for Controlled Drug Microinjection", **ACS Applied Materials & Interfaces**, 7(14563), 2015.
63. Dennis Pacardo, Frances Ligler*, Zhen Gu*, "Programmable Nanomedicine: Synergistic and Sequential Drug Delivery Systems", **Nanoscale**, 7(3381), 2015.
64. Wujin Sun, Zhen Gu*, "Engineering DNA-Scaffolds for Delivery of Anticancer Therapeutics", **Biomaterials Science**, 3(1018), 2015. (Invited Article for "Polymeric Biomaterials in Cancer Nanotechnology Special Issue")
65. Ran Mo, Tianyue Jiang, Wujin Sun, Zhen Gu*, "ATP-Responsive DNA/Graphene Nanoaggregates for Enhanced Control Drug Delivery", **Biomaterials**, 50(67), 2015.
66. Wanyi Tai, Ran Mo, Jin Di, Vinayak Subramanian, Xiao Gu, John Buse, Zhen Gu*, "Bio-Inspired Synthetic Nanovesicles for Glucose-Responsive Release of Insulin", **Biomacromolecules**, 15(3495), 2014.
67. Yue Lu, Ran Mo, Wanyi Tai, Wujin Sun, Dennis Pacardo, Frances Ligler, Zhen Gu*, "Self-Folded Redox/pH Dual-Responsive Nanocarriers for Anticancer Drug Delivery", **Chemical Communications**, 50(15105), 2014.
68. Yuqi Zhang, Jicheng Yu, Qundong Shen, Zhen Gu*, "Glucose-Responsive Synthetic Closed-Loop Insulin Delivery Systems", **Progress in Chemistry**, 1(11), 2015.
69. Ran Mo, Tianyue Jiang, Jin Di, Wanyi Tai, Zhen Gu*, "Emerging Micro- and Nanotechnology Based Synthetic Approaches for Insulin Delivery", **Chemical Society Reviews**, 43(3595), 2014. (Invited Review)
70. Yue Lu, Wujin Sun, Zhen Gu*, "Stimuli-Responsive Nanomaterials for Therapeutic Protein Delivery", **Journal of Controlled Release**, 194(1), 2014.
71. Quanyin Hu, Prateek Katti, Zhen Gu*, "Enzyme-Responsive Nanomaterials for Controlled Drug Delivery", **Nanoscale**, 6(12273), 2014.
72. Wujin Sun, Yue Lu, Zhen Gu*, "Advances in Anticancer Protein Delivery Using Micro- Nanoparticles", **Particle**, 31(1204), 2014. (Invited Article for "the Particles for Healthcare Applications Special Issue")

73. Rocco DiSanto, Vinayak Subramanian, Zhen Gu*, "Recent advances in nanotechnology for diabetes treatment", **WIREs Nanomedicine & Nanobiotechnology**, 7(548), 2015.
74. Dennis Pacardo, Bhanu Nupane, Gufeng Wang, Zhen Gu, Glenn Walker, Frances Ligler*, A Temperature Microsensor for Measuring Laser-Induced Heating in Gold Nanorods, **Analytical & Bioanalytical Chemistry**, 407(719), 2014.
75. Jicheng Yu, Yu-Lei Chen, Yu-Qi Zhang, Xi-Kuang Yao, Cheng-Gen Qian, Jun Huang, Sha Zhu, Xi-Qun Jiang, Qun-Dong Shen, Zhen Gu*, "pH-Responsive and Near-Infrared-Emissive Polymer Nanoparticles for Simultaneous Delivery, Release, and Fluorescence Tracking of Doxorubicin *in vivo*", **Chemical Communications**, 50(4699), 2014.
76. Wanyi Tai, Ran Mo, Yue Lu, Tianyue Jiang, Zhen Gu*, "Folding Drug-Pending Segment into Nanocarriers for Co-Delivery of Anticancer Drugs", **Biomaterials**, 35(7194), 2014.
77. Yizhou Dong, Ahmed A. Eltoukhy, Christopher A. Alabi, Omar F. Khan, Omid Veisheh, J. Robert Dorkin, Sasilada Sirirungruang, Hao Yin, Benjamin C. Tang, Jeisa M. Pelet, Delai Chen, Zhen Gu, Yuan Xue, Robert Langer, Daniel G. Anderson*, "Lipid-Like Nanomaterials for Simultaneous Gene Expression and Silencing *In Vivo*", **Advanced Healthcare Materials**, 3(1392), 2014.
78. Tianyue Jiang†, Ran Mo†, Adriano Bellotti, Jianping Zhou, Zhen Gu*, "Gel-Liposome-Mediated Co-Delivery of Anticancer Membrane-Associated Proteins and Small-Molecule Drugs for Enhanced Therapeutic Efficacy" **Advanced Functional Materials**, 24(2295), 2014. **(Cover Feature)**
79. Jin Di, Jennifer Price, Xiao Gu, Xiaoning Jiang, Yun Jing, Zhen Gu*, "Ultrasound-Triggered Regulation of Blood Glucose Levels Using Injectable Nano-Network", **Advanced Healthcare Materials**, 3(811), 2014. **(Cover Feature)**
80. Ran Mo, Tianyue Jiang, Zhen Gu*, "How Recent Progress in Multi-Drug Delivery to Cancer Cells by Liposomes" **Nanomedicine**, 9(1117), 2014. **(Invited Editorial)**
81. Ying Chen, Jingya Nan, Yue Lu, Chunpeng Wang, Fuxiang Chu, Zhen Gu*, "Hybrid Fe₃O₄-Poly (Acrylic Acid) Nanogels for Theranostic Cancer Treatment", **Journal of Biomedical Nanotechnology**, 11(5), 2014.
82. Yunlong Zhang, Jeisa M Pelet, Daniel A Heller, Jasmine Wallas, Yizhou Dong, Zhen Gu, Robert Langer, Daniel G. Anderson*, "Developing Lipid-Modified Aminoglycosides Derivatives for *in vivo* siRNA Delivery" **Advanced Materials**, 25(4641), 2013. **(Cover Feature)**
83. Zhen Gu, Tram Dang, Minglin Ma, Yunlong Zhang, Robert Langer, Daniel Anderson*, "Microgels Integrated with Enzyme Nanocapsules for Intelligent Insulin Delivery" **ACS Nano**, 7(6758), 2013.
84. Zhen Gu, Alex Aimetti, Tram Dang, Yunlong Zhang, Omid Veisheh, Hao Cheng, Robert Langer, Daniel Anderson*, "Injectable Nano-Network for Glucose-Mediated Insulin Delivery" **ACS Nano**, 7(4194), 2013. **(Cover Feature)**
85. Qun Wang*, Zhen Gu, Syed Jamal, Michael S. Detamore and Cory Berkland, "Hydroxyapatite and PLGA Nanoparticles Blends as Cohesive Colloidal Gels to Seeding Human Umbilical Cord Mesenchymal Stem Cells for Bone" **Tissue Engineering, Part A**, 19(2586), 2013.
86. Tram T. Dang, Anh V. Thai, Jeremy E. Slosberg, Joshua Cohen., Minglin Ma, Joshua Doloff, Jennifer Hollister-Lock, Zhen Gu, Hao Cheng, Gordon Weir, Robert Langer, Daniel G. Anderson, "Reduction of fibrosis by anti-inflammatory drug for improved efficacy of encapsulated islets in diabetes therapy" **Biomaterials**, 34 (5792), 2013.
87. Muxun Zhao, Biliang Hu, Zhen Gu, Kye-Il Joo, Pin Wang, Yi Tang*, "Degradable Polymeric Nanocapsule for Efficient Intracellular Delivery of a High Molecular Weight Tumor-Selective Protein Complex", **Nano Today**, 8 (11), 2013.
88. Muxun Zhao, Anuradha Biswas, Biliang Hu, Kye-Il Joo, Pin Wang, Zhen Gu*, Yi Tang*, "Redox-responsive Protein Nanocapsules for Intracellular Protein Delivery", **Biomaterials**, 32 (5223), 2011.

89. Zhen Gu*, Anuradha Biswas, Muxun Zhao, Yi Tang, "Tailoring Nanocarriers for Intracellular Protein Delivery", **Chemical Society Reviews**, 40 (3638), 2011.
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91. Zhen Gu*, Muxun Zhao, Yuewei Sheng, Laurent A. Bentolila, Yi Tang*, "Detection of Mercury Ion by Infrared Fluorescent Protein and Its Hydrogel-Based Paper Assay", **Analytical Chemistry**, 83 (2324) 2011.
92. Anuradha Biswas, Kye-Il Joo, Jing Liu, Muxun Zhao, Guoping Fan, Pin Wang, Zhen Gu*, Yi Tang*, "Endoprotease-mediated Intracellular Protein Delivery Using Nanocapsule", **ACS Nano**, 5 (1385), 2011.
93. Bin Sun, Min-Jie Sun, Zhen Gu, Qun-Dong Shen*, Shao-Jun Jiang, Yu Wang, "Conjugated Polymer Fluorescence Probe for Intracellular Imaging of Magnetic Nanoparticles", **Macromolecules**, 43 (10348), 2010.
94. Zhen Gu, Anuradha Biswas, Kye-Il Joo, Biliang Hu, Pin Wang, Yi Tang*, "Probing Protease Activity by Single-Fluorescent-Protein Nanocapsules" **Chemical Communications**, 46 (6467), 2010.
95. Zhen Gu*, Yi Tang*, "Enzyme-Assisted Photolithography for Spatial Functionalization of Hydrogels", **Lab on a Chip**, 10 (1946), 2010. **(Cover Feature)**
96. Zhen Gu, Xiao-Yuan Chen, Qun-Dong Shen*, Hai-Xiong Ge, Hai-Hua Xu, "Hybrid Nanocomposites of Semiconductor Nanoparticles and Conjugated Polyelectrolytes and Their Application as Fluorescence Biosensors" **Polymer**, 51 (902), 2010.
97. Ming Yan†, Juanjuan Du†, Zhen Gu, Min Liang, Yufang Hu, Wenjun Zhang, Tatiana Segura*, Zheng Liu*, Yi Tang*, Yunfeng Lu*, "Novel Intracellular Protein Delivery Platform Based on Single-Protein Nanocapsules" **Nature Nanotechnology**, 5 (48), 2010.
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99. Zhen Gu*, Suxian Huang, Yong Chen*, "Biomolecular Nanopatterning by Magnetic Electric Lithography" **Angewandte Chemie International Edition**, 48(952), 2009. **(Cover Feature)**
100. Lei Zhang*, Zhen Gu, Zhiping Yu, Xiangqing He, Yong Chen. "A CMOS Microarray with On-chip Decoder/Amplifier and Its Integration with Bio-Nano-System" **Journal of Semiconductors**, 29(10) (1947), 2008.
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• BOOK CHAPTERS

1. Zhen Gu*, Yi Tang, Yong Chen. "Fabrication of Biomolecular Nanopatterns" Chapter in: F. Columbus "Advances in Nanotechnology". NOVA Scientific Publisher. 2010.
2. Yuyan Weng, Yue Lu, Zhen Gu* "Hydrogels for Drug Delivery" Chapter in: J. Chan, C. Xu "Perspectives in Micro and Nanotechnology for Biomedical Applications". Imperial College Press, UK, 2014.

3. Wanyi Tai, Zhen Gu* “Enzyme Nanocapsules for Glucose Sensing and Insulin Delivery” Chapter in: P. Grunwald “Biocatalysis and Nanotechnology”. PanStanford Publishing, Singapore, 2014.
4. Wujin Sun, Zhen Gu* “RCA-generated self-degradable DNA nanoclews for pH-responsive delivery of anticancer drugs” Chapter in: V. Demidov “Rolling Circle Amplification”. Springer, 2016.
5. Dennis B. Pacardo, Frances Ligler*, Zhen Gu* “Dual-Wavelength-Triggered Gold Nanorods for Anticancer Treatment” Chapter in: S. H. Petrosko et al. “Biomedical Nanotechnology: Methods and Protocols”. Springer Press, 2016.
6. Yuqi Zhang, Jicheng Yu, Zhen Gu* “Hypoxia-Sensitive Vesicles for Glucose-Responsive Insulin Delivery” Chapter in: S. H. Petrosko et al. “Biomedical Nanotechnology: Methods and Protocols”. Springer Press, 2016.

PATENT APPLICATIONS

1. Robert Langer, Zhen Gu, Daniel Anderson, “Glucose-responsive microgels for closed loop insulin delivery”, ***International Patent Publication No. WO2013123492 A2***, 2013.
2. Robert Langer, Daniel Anderson, Zhen Gu, Alex Aimetti, “Self-regulated peptide hydrogel for insulin delivery”, ***International Patent Publication No. WO2013123492 A2***, 2013.
3. Daniel Anderson, Zhen Gu, Alex Aimetti, Robert Langer, “Injectable Nano-Network Gels for Diabetes Treatment” ***International Patent Publication No. WO/2014/179344***, 2014.
4. Yi Tang, Zhen Gu, Yunfeng Lu, Ming Yan, Anuradha Biswas, Guoping Fan. “Methods for Protease Assisted Protein Delivery”, ***U.S. Patent Publication No. US 20110274682 A1***, 2011.
5. Yi Tang, Zhen Gu, Muxun Zhao. “Redox Responsive Polymeric Nanocapsules for Protein Delivery” ***U.S. Patent Publication No. US 20140037748 A1***, 2011.
6. Zhen Gu, Jicheng Yu, “Glucose-Responsive Insulin Delivery System Using Hypoxia Sensitive Nanocomposites”, ***U.S. Provisional Patent Application No. 62/150,622***, filed 4/21/2015.
7. Zhen Gu, Wanyi Tai, “Folding Graft Copolymer with Pendant Drug Segment for Co-Delivery of Anticancer Drugs”, ***U.S. Provisional Patent Application No. 62/000,291***, filed 05/21/2014.
8. Zhen Gu, Ran Mo, Tianyue Jiang, “Methods and Constructs for Compound Delivery”, ***U.S. Provisional Patent Application No. 61/893,450***, filed 10/21/2013.
9. Zhen Gu, Chao Wang, Yanqi Ye, “Enhanced Cancer Immunotherapy by Microneedle Patch-Assisted Delivery of Checkpoint Blockade Antibodies”, ***U.S. Provisional Patent Application No. 62/301,789***, filed 03/01/2016.
10. Zhen Gu, Chao Wang, “Programmed Delivery of Cancer Immunotherapy”, ***U.S. Provisional Patent Application No. 62/308,513***, filed 03/16/2016.
11. Zhen Gu, Yanqi Ye, “Methods and Compositions Related to Physiologically Responsive Microneedle Delivery”, ***U.S. Provisional Patent Application No. 62/297,346***, filed 02/19/2016.
12. Zhen Gu, Chao Wang, “Glucose-Responsive Insulin Delivery Compositions and Methods”, ***U.S. Provisional Patent Application No. 62/278,614***, filed 01/14/2016.
13. Zhen Gu, Yue Lu, “Biocompatible Particles and Methods of Making and Use Thereof”, ***U.S. Provisional Patent Application No. 62/258,287***, filed 11/20/2015.
14. Zhen Gu, Quanyin Hu, “Platelet Membrane-Coated Drug Delivery System”, ***U.S. Provisional Patent Application No. 62/204,084***, filed 08/12/2015.

15. Zhen Gu, Wujin Sun, "Nucleic Acid Nanocages, Compositions, and Uses Thereof", **U.S. Provisional Patent Application No. 62/203,123**, filed 08/10/2015.
16. Qun-Dong Shen, Bin Sun, Yang Zhang, Zhen Gu. "Preparation and Application of a Magnetic/Fluorescent Hybrid Nanocomposite Material" **China Patent Publication No. 200810020415**, 2008.
17. Zhen Gu, Quanyin Hu, "Tumor microenvironment-mediated construction and deconstruction of extracellular drug-delivery depots", **NC State Case #: 15299**, 2015.
18. Zhen Gu, Xiaoning Jiang, Jin Di, Jinwoo Kim, "Spatiotemporal Drug Delivery Using Laser-Generated-Focused Ultrasound System", **NC State Case #: 15293**, 2015.
19. Zhen Gu, Yong Zhu, Shanshan Yao, Jin Di, "Stretch-Triggered Drug Delivery Devices", **NC State Case #: 15261**, 2015.
20. Zhen Gu, Wujin Sun, "DNA Nanoclew for Anticancer Drug Delivery", **NC State Case #: 15402**, 2016.
21. Zhen Gu, Dennis Pacardo, "Functionalized Gold Nanorods for Cancer Cell Imaging, Drug Delivery and Photothermal Therapy", **NC State Case #: 14235**, 2014.
22. Zhen Gu, Ran Mo, Tianyue Jiang, "Sequential and Site-Specific Delivery of Multiple Anticancer Therapeutics Using Programmed Nanodepots", **NC State Case #: 14043**, 2014.
23. Zhen Gu, Ran Mo, "ATP-Triggered Anticancer Drug Delivery", **NC State Case #: 14036**, 2013.
24. Zhen Gu, Yun Jing, Jin Di, "Ultrasound-Triggered Controlled Drug Delivery Using Injectable Nano-Network", **NC State Case #: 14037**, 2013.
25. Zhen Gu, Wanyi Tai, "Polymeric Nanovesicle for Self-Regulated Insulin Delivery", **NC State Case #: 14012**, 2013.
26. Zhen Gu, Yi Tang, Yunfeng Lu, Ming Yan. "Protease-Assisted Photolithography" **UC.-Case#-086**, 2010.
27. Zhen Gu, Yi Tang. "Photo/Enzyme Synergistically Responsive Matrix" **UC.-Case#-246**, 2010.
28. Zhen Gu, Yi Tang, Anuradha Biswas, Guoping Fan. "Endoprotease-Mediated Protein Intracellular Delivery" **UC.-Case#-014**, 2010.
29. Zhen Gu, Yi Tang, "Protein/Hydrogel Based Paper Assay" **UC.-Case#-211**, 2010.

INVITED TALKS AND NAMED LECTURES

1. "Smart Insulin Delivery-an Update", **Sanofi**, April. 13, 2017, Frankfurt, Germany.
2. "Local Delivery of Immune Checkpoint Inhibitors", **2017 ACS Spring Meeting**, Apr. 2-6, 2017, San Francisco, CA, USA.
3. "Leverage Physiology for Smart Drug Delivery", **Department of Chemistry, University of Texas at Dallas**, Mar. 31, 2017, Dallas, TX, USA.
4. "Leverage Physiology for Smart Drug Delivery", **IBM**, Mar. 10, 2017, Syracuse, NY, USA.
5. "Leverage Physiology for Smart Drug Delivery", **Department of Textile Engineering, NC State University**, Feb. 15, 2017, Raleigh, NC, USA.
6. "Bio-Responsive Smart Drug Delivery", **Department of Biomedical Engineering, Duke University**, Feb. 9, 2017, Durham, NC, USA.

7. "Leverage Physiology for Bio-Responsive Drug Delivery", **JDRF Mission Summit Conference**, Jan. 25-27, 2017, San Francisco, CA, USA.
8. "Leverage Physiology for Bio-Responsive Drug Delivery", **2nd International Symposium on Translational Nanomedicine**, Jan. 4-7, 2017, Guangzhou, China.
9. "Leverage Physiology for Precision Medications", **University of Hong Kong**, Jan. 4, 2017, Hong Kong, China.
10. "Leverage Physiology for Precision Medications", **Hong Kong City University**, Jan. 3, 2017, Hong Kong, China.
11. "Bio-Responsive Drug Delivery", **School of Medicine, Shanghai Jiaotong University**, Dec. 29, 2016, Shanghai, China.
12. "Bio-Responsive Drug Delivery", **School of Medicine, Shanghai Tongji University**, Dec. 28, 2016, Shanghai, China.
13. "Bio-Responsive Drug Delivery", **Nanjing Tech University**, Dec. 26, 2016, Nanjing, China
14. "Bio-Responsive Drug Delivery", **Duke University**, Nov. 18, 2016, Durham, NC, USA.
15. "Leverage Physiology for Precision Medications", **University of Connecticut**, Nov. 11, 2016, Storrs, CT, USA.
16. "Bio-Responsive Drug Delivery", **Toxicology Program Seminar, NC State University**, Nov. 8, 2016, Raleigh, NC, USA
17. "Leverage Physiology for Precision Medications", **2nd China Nanomedicine International Conference**, Oct. 17-19, 2016, Wuhan, China.
18. "Bioresponsive Microneedle Patches", **6th International Nanobio Conference and 1st Symposium on Minimally Invasive and Image Guided Surgery**, Oct. 17-18, 2016, Nanjing, China.
19. "Leverage Physiology for Precision Drug Delivery", **Leading Edge Technologies on Crystallization Engineering and Clinical Therapeutic Development International Conference**, Oct. 15-16, 2016, Tianjin, China. (Plenary Speaker)
20. "Bioresponsive Drug Delivery", **Nankai University**, Oct. 14, 2016, Tianjin, China.
21. "Stretch-Triggered Drug Delivery", **Surgery Grand Rounds at UNC Chapel Hill**, Sep. 24, 2016, Chapel Hill, NC, USA.
22. "Bio-Responsive Microneedles", **43rd Controlled Release Society Annual Meeting**, Jul. 16-18, 2016, Seattle, WA, USA.
23. "Leverage Physiology for Precision Medications", **Sun Yat-Sen University**, Jul. 14, 2016, Guangzhou, China.
24. "Leverage Physiology for Precision Drug Delivery", **1st symposium of the Chinese American Society of Nanomedicine and Nanobiotechnology (CASNN)**, Jul. 10-12, 2016, Beijing, China. (Keynote Speaker)
25. "Leverage Physiology for Precision Medications", **National Center for Nanoscience and Nanotechnology**, Jul. 7, 2016, Beijing, China.
26. "Leverage Physiology for Precision Medications", **Tsinghua University**, Jul. 7, 2016, Beijing, China.
27. "Leverage Physiology for Precision Medications", **Beijing University of Chemical Technology**, Jul. 6, 2016, Beijing, China.
28. "Leverage Physiology for Precision Medications", **School of Chemistry and Chemical Engineering, Peking University**, Jul. 6, 2016, Beijing, China.
29. "Leverage Physiology for Precision Medications", **School of Pharmacy, Peking University**, Jul. 5, 2016, Beijing, China.

30. "Leverage Physiology for Precision Medications", **Longjin Pharmaceutical Company**, Jul. 1, 2016, Kunming, China.
31. "Leverage Physiology for Precision Medications", **School of Chemistry and Chemical Engineering, Nanjing University**, Jun. 29, 2016, Nanjing, China.
32. "Leverage Physiology for Precision Medications", **University of Science and Technology of China**, Jun. 28, 2016, Hefei, China.
33. "Leverage Physiology for Precision Medications", **China Pharmaceutical University**, Jun. 21, 2016, Nanjing, China.
34. "Smart Insulin Delivery", **Jiangsu Province People's Hospital**, Jun. 19, 2016, Nanjing, China.
35. "Leverage Physiology for Precision Medications", **Functional Nano & Soft Materials Laboratory, Soochow University**, Jun. 24, 2016, Suzhou, China.
36. "Leverage Physiology for Precision Drug Delivery", **4th Biomaterials and Biomedical Devices Innovation Conference**, Jun. 23, 2016, Suzhou, China. **(Keynote Speaker)**
37. "Smart Nano-Carriers for Drug Delivery", **11th Sino-US symposium on Nanoscale Science and Technology**, Jun. 17-19, 2016, Nanjing, China.
38. "Leveraging Physiology for Precision Drug Delivery", **2016 ACS Spring Meeting**, Mar. 13-17, 2016, San Diego, CA, USA.
39. "Leveraging Physiology for Precision Drug Delivery", **2016 Nano-Formulation Workshop**, Mar. 14-16, 2016, Chapel Hill, NC, USA.
40. "Leveraging Physiology for Precision Drug Delivery", **ASME 5th NanoEngineering for Medicine and Biology Conference**, Feb. 21-24, 2016, Houston, TX, USA. **(Keynote Speaker)**
41. "Small Insulin Delivery: Opportunities and Challenges", **1st Therapeutic Peptides Symposium**, Feb. 4, 2016, Paris, France.
42. "Smart Insulin Delivery", **EmTech, MIT Technology Review Symposium**, Nov. 2, 2016, Boston, MA, USA.
43. "Small & Smart Drug Delivery", **Surgery Grand Rounds at UNC Chapel Hill**, Jul. 22, 2015, Chapel Hill, NC, USA.
44. "Leveraging Physiology for Precise Drug Delivery", **Sigma Aldrich Webinar**, Jun. 22, 2015.
45. "Leveraging Physiology for Precise Drug Delivery", **17th International Drug Delivery Symposium**, Jun. 15, 2015, Salt Lake City, USA.
46. "Smart Insulin Delivery- Inspired by Nature", **75th ADA Annual Meeting**, Jun. 4, 2015, Boston, USA.
47. "Smart Insulin Delivery", **Eli Lilly**, Jun. 2, 2015, Indianapolis, USA.
48. "Programmed Drug Delivery", **"Nanotechnology Workshop" at Duke University**, Apr. 17, 2015, Durham, USA.
49. "Programmed Drug Delivery", **Chemistry Department at University of North Carolina at Charlotte**, Apr. 16, 2015, Charlotte, USA.
50. "Leveraging Physiology for Precise Drug Delivery" **2015 ACS Spring Meeting**, Mar. 22-26, 2015, Denver, CO, USA.
51. "Small but Smart Delivery", **Seminar of MRS Student Chapter at NC State**, Oct. 27, 2014, Raleigh, USA.

52. "Small but Smart Delivery", **American-Chinese Biotechnology Forum at North Carolina**, Oct. 26, 2014, Research Triangle Park, USA.
53. "Smart Insulin Delivery", **Sanofi**, Sep. 4, 2014, Frankfurt, Germany.
54. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Pharmacy, Huazhong University of Science and Technology**, Jul. 10, 2014, Wuhan, China.
55. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Pharmacy, Nanjing Medical University**, Jul. 8, 2014, Nanjing, China.
56. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Advanced Materials, Nanjing Tech University**, Jul. 8, 2014, Nanjing, China.
57. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Chemistry and Chemical Engineering, Nanjing University**, Jul. 7, 2014, Nanjing, China.
58. "Physiological Signals-Triggered Controlled Drug Delivery", **Technical Institute of Physics and Chemistry, CAS**, Jul. 4, 2014, Beijing, China. "Young Scientists Forum"
59. "Physiological Signals-Triggered Controlled Drug Delivery", **National Center for Nanoscience and Nanotechnology**, Jul. 2, 2014, Beijing, China. "Young Scientists Forum in Nanotechnology"
60. "Physiological Signals-Triggered Controlled Drug Delivery", **Department of Pharmacy, Tsinghua University**, Jul. 3, 2014, Beijing, China.
61. "Physiological Signals-Triggered Controlled Drug Delivery", **Molecular Pharmaceutics Division, UNC-CH**, Mar. 7, 2014, Chapel Hill, NC, USA.
62. "Physiological Signals-Triggered Controlled Drug Delivery", **Chemistry Department, UCLA**, Feb. 28, 2014, Los Angeles, CA, USA.
63. "Small But Smart Drug Delivery", **RTP 180°**, Feb. 20, 2014, Research Triangle Park, NC, USA.
64. "Smart Insulin Delivery", **Carolina Science Cafe series, NC Science Festival**, Dec. 4, 2013, Chapel Hill, NC, USA.
65. "Smart Protein Gels", **Department of Pharmaceutical Science at Campbell University**, Nov. 20, 2013, Buies Creek, NC, USA.
66. "Smart Insulin Gels", **the 13th Annual Diabetes Technology Meeting (DTM)**, Nov. 1, 2013, San Francisco, CA, USA.
67. "Smart Protein Gels", **Seminar for Department of Chemical and Biomolecular Engineering, North Carolina State University**, Sep. 10, 2013, Raleigh, NC, USA.
68. "Smart Insulin Gels", **Special Seminar for Department of Endocrinology, University of North Carolina at Chapel Hill**, Jun. 27, 2013, Chapel Hill, NC, USA.
69. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Special Seminar for Graduate Students in Soochow University**, Jun. 4, 2013, Soochow, Jiangsu, China.
70. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Special Seminar in Subei People's Hospital and Yangzhou University**, May. 30, 2013, Yangzhou, Jiangsu, China.
71. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **College of Bioscience and Biomedical Engineering, Southeast University**, May. 29, 2013, Nanjing, Jiangsu, China.

72. "Proteins Gels for Therapeutics and Diagnostics", **School of Biomedical Engineering, Nanyang Technological University**, May. 24, 2013, Singapore.
73. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **the Pharmaceutical Expert Lecture Series in China Pharmaceutical University**, May. 22, 2013, Nanjing, Jiangsu, China.
74. "Proteins Gels for Therapeutics and Diagnostics", **Special Seminar in College of Chemistry and Chemical Engineering, Nanjing University of Technology**, May. 20, 2013, Nanjing, Jiangsu, China.
75. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Langer Lab Seminar Series in Massachusetts Institute of Technology**, Apr. 11, 2012, Cambridge, MA, USA.
76. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **the Lindbergh Lecture Series in University of Wisconsin-Madison**, Mar. 22, 2012, Madison, WI, USA.
77. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Special Seminar for the Joint Biomedical Engineering Department at University of North Carolina at Chapel Hill and North Carolina State University**, Mar. 12, 2012, Chapel Hill-Raleigh, NC, USA.
78. Hydrogel Based Protein Patterning, Encapsulation and Delivery" **Special Seminar for Graduate Students in Nanjing University**, Sep. 16, 2011, Nanjing, Jiangsu, China.
79. "At the Interface of Bio and Nano", **2010 Nagoya University and UCLA Collaboration Conference**, Mar. 4-5, 2010, Los Angeles, CA, USA.

RESEARCH MENTORING

• Postdoctoral Researchers

- Wanyi Tai, Ph.D. (2012-2013)
- Ran Mo, Ph.D. (2012-2014; Specially-Appointed Full Professor in Jiangsu Province, China)
- Tianyue Jiang, Ph.D. (2014-2014)
- Dennis Pacardo, Ph.D. (co-advised with Frances Ligler, 2013-2016)
- Chao Wang, Ph.D. (2015-present)
- Jinqiang Wang, Ph.D. (2016-present)
- Zhaowei Chen, Ph.D. (2016-present)
- Xudong Zhang, Ph.D. (2016-present)
- Edikan Archibong, Ph.D. (co-advised with Frances Ligler, 2017-present)

• Graduate Students

- Yuqi Zhang (2015-present, Ph.D. expected 2020)
- Jicheng Yu (2014-present, Ph.D. expected 2019)
- Quanyin Hu (2014-present, Ph.D. expected 2019)
- Yanqi Ye (2014-present, Ph.D. expected 2019)
- Yue Lu (2013-present, Ph.D. expected 2017; Graduate Research Advances in Delivery Science Award, CRS; Graduate Student Research Award in Biomaterials, AIChE)
- Wujin Sun (2013-present, Ph.D. expected 2017; Chinese Government Award for Outstanding Students Abroad)
- Jin Di (2012-2015, Ph.D.; Distinguished Dissertation Award at UNC Chapel Hill)
- Rocco DiSanto (2012-2014, M.S.)

• Undergraduate Students

- Grace Wright (2015-present, B.S. expected 2017)
- Gabrielle Hochu (2014-present, B.S. expected 2017)
- Hunter Bomba (2014-present, B.S. expected 2017)
- Davis Ranson (2014-present, B.S. expected 2017)
- Balaji Lenin (2014-present, B.S. expected 2017)
- Apoorva Thatavarty (2014-present, B.S. expected 2017)
- Yuqi Zhang (2014-2015, B.S.)
- Abby Jindal (2013-2016, B.S.)

- Okello Bogle (2013-2016, B.S.)
- Maggie Reiff (2014-2015, B.S.)
- Michaela Rikard (2014-2016, B.S.)
- Emily Nguyen (2014-2016, B.S.)
- Jennifer Price (2014-2014, B.S.)
- Vinayak Subramanian (2014-2015, B.S.)
- Adriano Bellotti (2014-2015, B.S.)
- Tianfei Liu (2010, UCLA Cross-Disciplinary Scholars in Science and Technology (CSST) programs)

• **Visiting Scholars**

- Shuangjiang Yu (2016-present, Associate Professor from Changchun Institute of Applied Chemistry, CAS, China)
- Hongliang Xin (2016-present, Associate Professor from Nanjing Medical University, China)
- Xiuli Hu (2015-present, Associate Professor from Changchun Institute of Applied Chemistry, CAS, China)
- Chenggen Qian (2015-2016, Ph.D. student from Nanjing University, China)
- Tianyue Jiang (2012-2014, Ph.D. student from China Pharmaceutical University, China)
- Liqiang Wang (2012-2013, Professor from Huaqiao University, China)

• **Service as a M.S./Ph.D. Committee Member**

- Kai Chen (Ph.D., 2012-2014, Chair: Joseph M. DeSimone, Chemistry at UNC-CH)
- Ashley Rachelle (Ph.D., 2013-present, Chair: Joseph M. DeSimone, Chemistry at UNC-CH)
- Justin Johnson (Ph.D., 2013-present, Chair: Mark Schoenfish, Chemistry at UNC-CH)
- Xiaji Liu (Ph.D., 2012-present, Chair: Jason M. Haugh, Chemical Engineering at NCSU)
- Jing Cao (M.S. 2013-2014, Chair: Julie Willoughby, Textiles College at NCSU)
- Chirag R. Gajjar (Ph.D. 2013-present, Chair: Martin King, Textiles College at NCSU)
- Soumya Vijayan Nair (M.S., 2012-2014, Chair: Steve Soper, Biomedical Engineering at UNC/NCSU)
- Siyao Huang (Ph.D., 2012-2014, Chair: Hsiao-Ying Shadow Huang, Mechanical Engineering at UNC/NCSU)
- Matthew Thomas Haynes (Ph.D., 2014-present, Chair: Leaf Huang, Molecular Pharmaceutics at UNC-CH)

TEACHING EXPERIENCE

• **2015-2016 Spring, Instructor, UNC-CH/NC State**

Lecture: Advanced Drug Delivery Systems (BME590) **Rating: 4.6/5.0**

• **2013-2016 Fall, Instructor, UNC-CH/NC State**

Lecture and lab course: Biomedical Engineering Measurements (BME204) **Rating: 4.7/5.0**

• **2007 Spring, Teaching Assistant, UCLA**

Lecture course: Nanoscience and Biotechnology

• **2007 Winter, 2008 Winter, Teaching Assistant, UCLA**

Lab course: Nanoscale Fabrication, Characterization, and Biodetection Lab

• **2004 Spring, Teaching Assistant, Nanjing University**

Lecture course: Introduction to Polymer Science and Engineering

PROFESSIONAL ACTIVITIES

• **Academic Affiliations**

Member of American Diabetes Association, 2013-Present

Member of American Society for Engineering Education (ASEE), 2012-Present

Member of Biomedical Engineering Society (BMES), 2011-Present

Member of Materials Research Society (MRS), 2008-Present

Member of American Association of Pharmaceutical Scientists (AAPS), 2012-2013

Member of Controlled Release Society (CRS), 2011-Present

Member of American Chemical Society (ACS), 2007-2008

• **Editorships**

Guest Associate Editor

Bioengineering and Translational Medicine

Editorial Board

Scientific Reports

Advanced Biosystems

Nanotheranostics
Progress of Chemistry
Chinese Biomedical Instruments

• **Grants Reviewer**

Panelist

National Institutes of Health (NIH/R15), USA
 National Institutes of Health (NIH/R21), USA
 National Science Foundation (NSF/Biomaterials), USA
 Juvenile Diabetes Research Foundation (JDRF/Innovation Grants), USA
 SMART Innovation Center, Singapore
 Agency for Science, Research & Technology (A*STAR), Singapore

• **Symposium Organizers/Chairs**

Symposium Organizer/Co-Organizer

“Biomaterials for Immunotherapy”, 277th ACS Annual Spring Meeting, San Francisco, 2017
 “Nanomedicines: Targeting and Clearance”, 274th ACS Annual Spring Meeting, San Diego, 2016
 “Nanomaterials in Translational Medicine”, MRS Annual Spring Meeting, San Francisco, 2015

Session Chair/Co-Chair

“Advances in Pharmacoengineering: Biologically Inspired Designs”, Annual Chapel Hill Pharmaceutical Sciences Conference, Chapel Hill, 2014
 “Biomaterials for Cardiovascular Engineering”, Annual Meeting of Society for Biomaterials, Denver, 2014
 “Materials for Nanomedicine”, Annual World Congress of NanoMedicine, Suzhou, China, 2013
 “Biomolecular Engineering Session”, BMES Annual Meeting, Atlanta, 2012

• **Journal Paper Reviewer (>50 journals)**

ACS Applied Materials & Interfaces
ACS Nano
Acta Biomaterialia
Advanced Materials
Advanced Functional Materials
Advanced Healthcare Materials
Advanced Powder Technology
Analytical Chemistry
Analytical Methods
Angewandte Chemie International Edition
Biomacromolecules
Biomaterials
Biomaterials Science
Chemical Communications
Chemical Society Reviews
Chemistry of Materials
Chemistry Science
Colloids and Surfaces B: Biointerfaces
Current Cancer Drug Targets
Green Chemistry
Journal of Applied Polymer Science
Journal of Biomedical Technology and Research
Journal of Controlled Release
Journal of Laboratory Automation
Journal of the American Chemical Society
Journal of Materials Chemistry
Journal of Nanomaterials
Journal of Nanoscience and Nanotechnology
Lab on a Chip
Macromolecules

Macromolecular Chemistry and Physics
Materials Letters
Materials Science and Engineering B
Microelectronic Engineering
Molecular Pharmaceutics
Molecular Therapy
Molecule BioSystems
Nanomedicine
Nanoscale
Nature Biomedical Engineering
Nature Chemical Biology
Nature Chemistry
Nature Communications
Nature Nanotechnology
Nature Reviews Materials
PLOS One
PNAS
Polymer
Polymer Bulletin
Polymer Chemistry
Progress in Chemistry
RSC Advances
Science Advances
Scientific Reports
Small
Soft Matter
Technology
WIREs Nanomedicine & Nanobiotechnology

OUTREACH

06/2014 Director- "Yell Cell" High School Students Summer Camp- 5 high school students took 6 weeks in the lab to learn fundamental and experimental skills for drug delivery.

03/2014 RTP 180°, presented an invited talk in the Headquarter of RTP: "Smart Drug Delivery" (~ 300 attendees).

02/2014 Invited guest, discussed 45 min on "new methods for cancer treatment" in Ms. Joni Aldrich's esteemed international radio shows on cancer treatment (W4CS Radio, internationally broadcast).

01/2014 Invited speaker of *Materials Today*, presented opinion on "Targeting Anticancer Drug Delivery" through Podcast.

12/2013 Sponsored by NC Science Festival, presented an invited talk in the Carolina Science Café Series: "Smart Insulin Delivery" (~ 50 attendees)

12/2013 Sponsored by America Institute of Physics (AIP), 1 min TV Show in "Inside Science TV".

06/2013-pres. Director- K12 Students Outreach Program "Engineering Our Way to Stop Diabetes"- developed a variety of modules for promoting advanced technology to prevent and fight diabetes (total: ~ 200 attendees).