

## Curriculum Vitae

### ZHEN GU, PH.D.

#### Joint Department of Biomedical Engineering

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

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#### POSITIONS AND EMPLOYMENT

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• **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

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• **Massachusetts Institute of Technology (MIT) | Harvard Medical School (HMS)** Cambridge, MA  
2010-2012

**Postdoctoral Fellow**

Koch Institute for Integrative Cancer Research, Department of Chemical Engineering, MIT

Children's Hospital Boston, HMS

Advisor: Robert S. Langer

• **University of California, Los Angeles (UCLA)** Los Angeles, CA  
2006-2010

**Ph.D, Chemical and Biomolecular Engineering / Nanobiotechnology**

Department of Chemical and Biomolecular Engineering, School of Engineering and Applied Science

Advisor: Yi Tang

• **Nanjing University (NJU)** Nanjing, China  
2003-2006

**M.S., Polymer Chemistry and Physics**

Department of Polymer Science and Engineering, School of Chemistry and Chemical Engineering, NJU

Advisor: Qundong Shen

• **Nanjing University (NJU)** Nanjing, China  
1999-2003

**B.S., Chemistry**

Department of Chemistry, School of Chemistry and Chemical Engineering, NJU

Advisors: Qundong Shen | Changzheng Yang

#### HONORS AND AWARDS

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- Sloan Research Fellow (Chemistry), Alfred P. Sloan Foundation, 2016
- NC TraCS 4D (Drugs, Devices and Diagnostics Development) Research Award, 2016
- Top 10 Science Images in 2015, *Science Magazine*, 2015
- TR35-Global Top Innovator under 35 (Pioneer in Biomedicine and Materials), MIT Technology Review, 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 strategies that apply stimuli-responsive systems for *precisely* delivering therapeutics in dose-, spatial- and temporal-controlled fashions. By accumulating and integrating tools of biomolecular engineering, materials chemistry 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  $\beta$ -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 multiple drugs 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*, *Science* (Homepage Headline), *Nature* (Homepage Headline; News and View), *Science Translational Medicine*, *Molecular Therapy*, *Materials Today*, *Nano Today*, *C&E News* and *Science Daily* (14 times). [See details in the Publication Session \(in blue\).](#)

### • PERSONAL SPECIFIC HIGHLIGHTS

01/2016 *Results, NC State*  
 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*.  
 01/2015 *Qiaobao* (Chinese-in-US News, Front Page), South and North Carolina.  
 11/2014 *HigherEducationWorks* (Homepage).  
 11/2014 *NC State Homepage Headline*  
 06/2014 *NC State Engineering Alumni Magazine*.  
 04/2014 *University Gazette (UNC)*  
 03/2014 *Qiaobao* (Chinese-in-US News, Front Page), South and North Carolina.  
 11/2013 *NC State Engineering Alumni Magazine*.  
 07/2013 *UNC Endeavors* (Homepage).

06/2013 **Haimen TV News** (Gu's Hometown in China)-Society Horizon.

07/2010 **China Scholars**.

### • COMMENTING FOR OTHERS' RESEARCH

1/2014 **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; IF: impact factor)

1. 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**, in press, 2016.

2. Yanqi Ye, Jicheng Yu, Chao Wang, Nhu-Y Nguyen, John B. Buse, Zhen Gu\*, "Pancreatic  $\beta$ -Cell Capsules Cells and Synthetic Glucose-Signal Amplifiers for Smart Insulin Delivery", **Advanced Materials**, in press, 2016.

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**, in press, 2015.

- Featured by Top Health News of **Science Daily**, **Popular Science**, **UNC News Room**, **NC State News Room** and **FierceDrugDelivery**.

4. Wujin Sun, Zhen Gu\*, "ATP-Responsive Drug Delivery Systems", preparation for **Expert Opinion on Drug Delivery**. (Invited Article)

5. Quanyin Hu, Wujin Sun, Hunter Bomba, Zhen Gu\*, "Tumor Microenvironment-Mediated Construction and Deconstruction of Depots for Enhanced Anticancer Efficacy", **Nano Letters**, in press, 2016.

6. Yuqi Zhang, Yong Zhu\*, Zhen Gu\*, "Elastic Drug Delivery: could treatments be triggered by patient movement?", **Nanomedicine**, in press.

7. 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**, in press.

8. Jicheng Yu, Zhen Gu\*, "Hypoxia-Sensitive Materials for Biomedical Applications", **Annals of Biomedical Engineering**. (Invited Article for special issue on "Biomaterials")

9. 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. **(Most-Accessed Paper)**  
- Featured by **Nature (News & View)**, **Science (homepage headline news)**, **Washington Post**, **C&EN News**, **The Telegraph**, **Reuters**, **Chemistry World**

10. 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. **(Most-Accessed Paper)**

11. Quanyin Hu, Chenggen Qian, Yanqi Ye, Chao Wang, Zhen Gu\*, "Anticancer Platelet-Mimicking Nanovehicles", submitted to **Advanced Materials**, in press, 2015. **(Selected as a VIP Paper; Cover Feature)**

12. 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**, in press, 2015. **(Selected as a Hot Paper; Cover Feature)**  
- Featured by [Top Health News of Science Daily](#), [C&EN News](#), [UNC News Room](#), [NC State News Room](#) and [FierceDrugDelivery](#).
13. 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**, in press, 2015.  
- Featured by [Top Health News of Science Daily](#), [UNC News Room](#), [NC State News Room](#) and [FierceDrugDelivery](#).
14. Ran Mo, Zhen Gu\*, “Tumor-Microenvironment Triggered Drug Delivery”, **Materials Today**, in press, 2015.
15. Quanyin Hu, Wujin Sun, Zhen Gu\*, “Recent advances of cocktail chemotherapy by combination drug delivery systems”, **Advanced Drug Delivery Reviews**, in press, 2015. (Invited Article)
16. Ran Mo, Tianyue Jiang, Rocco DiSanto, Wanyi Tai, Zhen Gu\*, “ATP-Triggered Anticancer Drug Delivery” **Nature Communications**, 5(3364), 2014. **(Most-Accessed Paper)**  
- Featured by [Daily Headline of Nature](#), [Nature Asia](#), [Science Daily](#), [Kurzweilai](#), [WNCT TV](#) and [FierceDrugDelivery](#).
17. 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.  
- Featured by [Top Health News of Science Daily](#), [UNC News Room](#), [NC State News Room](#) and [FierceDrugDelivery](#).
18. 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.
19. Ran Mo, Tianyue Jiang, Zhen Gu\*, “Enhanced Anticancer Efficacy by ATP-Mediated Liposomal Drug Delivery”, **Angewandte Chemie International Edition**, 53(5810), 2014.  
- Featured by [Science Daily](#), [SciBX\(Nature/BioCentury\)](#), [WorldPharmNews](#), [Eureka! Science News](#), [Kurzweilai](#), [Phys.Org](#) and [Nanowerk](#).
20. Wujin Sun, Yue Lu, Zhen Gu\*, “Rolling Circle Amplification (RCA) for Engineering Drug Delivery Carriers” **Therapeutic Delivery**, in press, 2015.
21. 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; Most-Accessed Paper)**  
- Featured by [Materials Today](#), [Nano Today](#), [Top Health News of Science Daily](#), [UNC News Room](#), [NC State News Room](#) and [FierceDrugDelivery](#).
22. Jin Di, Jinwook Kim, Quanyin Hu, Xiaoning Jiang\*, Zhen Gu\*, “Spatiotemporal Drug Delivery Using Laser-Generated-Focused Ultrasound System”, **Journal of Controlled Release**, in press, 2015.
23. 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**, in press, 2015.
24. 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**, in press, 2015. **(Cover Feature; Young Innovators Special Issue)**.
25. Yanqi Ye, Jicheng Yu, Zhen Gu\*, “In Situ Preparation of Stimuli-Responsive Protein Nanogels”, **Macromolecular Chemistry and Physics**, in press, 2015. (Invited Article; “Young Talents in Polymer Science” Specific Issue)

26. 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.
27. Wenyan 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.
28. 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.
29. Dennis Pacardo, Frances Ligler\*, Zhen Gu\*, "Programmable Nanomedicine: Synergistic and Sequential Drug Delivery Systems", **Nanoscale**, 7(3381), 2015.
30. Wujin Sun, Zhen Gu\*, "Engineering DNA-Scaffolds for Delivery of Anticancer Therapeutics", **Biomaterials Science**, in press, 2015. (Invited Article for "Polymeric Biomaterials in Cancer Nanotechnology Special Issue")
31. Ran Mo, Tianyue Jiang, Wujin Sun, Zhen Gu\*, "ATP-Responsive DNA/Graphene Nanoaggregates for Enhanced Control Drug Delivery", **Biomaterials**, 50(67), 2015.
32. 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. **(Most-Accessed Paper)**  
- Featured by [HigherEducationWorks](#).
33. 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.
34. Yuqi Zhang, Jicheng Yu, Qundong Shen, Zhen Gu\*, "Glucose-Responsive Synthetic Closed-Loop Insulin Delivery Systems", **Progress in Chemistry**, 1(11), 2015.
35. 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)**
36. Yue Lu, Wujin Sun, Zhen Gu\*, "Stimuli-Responsive Nanomaterials for Therapeutic Protein Delivery", **Journal of Controlled Release**, 194(1), 2014. **(Most-Accessed Paper)**
37. Quanyin Hu, Prateek Katti, Zhen Gu\*, "Enzyme-Responsive Nanomaterials for Controlled Drug Delivery", **Nanoscale**, 6(12273), 2014.
38. 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")
39. Rocco DiSanto, Vinayak Subramanian, Zhen Gu\*, "Recent advances in nanotechnology for diabetes treatment", **WIREs Nanomedicine & Nanobiotechnology**, 7(548), 2015. **(Invited Review)**
40. 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.
41. 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.
42. 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. **(Most-Accessed Paper; Altmetric Score: listed #2 in Biomaterials)**

- Featured by [Homepage of NC State](#), [Science Daily](#), [WorldPharmNews](#), [Eureka! Science News](#), [Kurzweilai](#) and [Nanowerk](#).

43. 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.

44. 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; Most-Accessed Paper; Altmetric Score: listed #5 in Advanced Functional Materials)**

- Featured by [Molecular Therapy](#), [Materials Today](#), [Materials View](#), [Science Daily](#), [Kurzweilai](#), ["Wiki"-Nanomedicine](#), [News Observer](#), [FierceDrugDelivery](#) and [Triangle Business Journal](#).

45. 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; Altmetric Score: listed #1 in Advanced Healthcare Materials)**

- Featured by [Science Daily](#), [The Guardian](#), [UK Mail Daily](#), [Kurzweilai](#), [The Engineer](#).

46. Ran Mo, Tianyue Jiang, [Zhen Gu](#)\*, "How Recent Progress in Multi-Drug Delivery to Cancer Cells by Liposomes" **Nanomedicine**, 9(1117), 2014. **(Invited Editorial)**

47. Ying Chen, Jingya Nan, Yue Lu, Chunpeng Wang, Fuxiang Chu, [Zhen Gu](#)\*, "Hybrid Fe<sub>3</sub>O<sub>4</sub>-Poly (Acrylic Acid) Nanogels for Theranostic Cancer Treatment", **Journal of Biomedical Nanotechnology**, 11(5), 2014.

48. 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)**

49. [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.

- Most-read article in **ACS Nano** during July-August, 2013; Featured by [Science Daily](#), [Kurzweilai](#), [FierceDrugDelivery](#), [Nanowerk](#), [AIP-Inside Science](#).

50. [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)**

- Top 3 most-read article in **ACS Nano** during 2013; Featured by [TIME Magazine](#), [Fox News](#), [The Guardian](#), [Science Daily](#), [Yahoo News](#), [American News](#), [C&EN](#), [MIT Weekly Best News](#), [Editor's Choice of Science Translational Medicine](#), [Nano Today](#), ["Wiki"-Nanomedicine](#).

51. 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.

52. 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.

53. 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.

- Featured by [Science Daily](#), [Kurzweilai](#), [Nanowerk](#), [AIP-Inside Science](#), ["Wiki"-Nanomedicine](#).

54. 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.

55. Zhen Gu\*, Anuradha Biswas, Muxun Zhao, Yi Tang, "Tailoring Nanocarriers for Intracellular Protein Delivery", **Chemical Society Reviews**, 40 (3638), 2011.
56. Kye-Il Joo, Yun Fang, Yarong Liu, Liang Xiao, Zhen Gu, April Tai, Chi-Lin Lee, Yi Tang, Pin Wang\*, "Enhanced Real-Time Monitoring of Adeno-Associated Virus Trafficking by Virus-Quantum Dot Conjugates" **ACS Nano**, 5 (3523) 2011.
57. 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.
58. 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.
59. 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.
60. 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.
61. Zhen Gu\*, Yi Tang\*, "Enzyme-Assisted Photolithography for Spatial Functionalization of Hydrogels", **Lab on a Chip**, 10 (1946), 2010. **(Cover Feature)**
62. 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.
63. 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.  
- Featured by [Science Daily](#), [World Journal](#), [Nano Werk](#), [C&EN](#).
64. Zhen Gu, Ming Yan, Biliang Hu, Kye-Il Joo, Anuradha Biswas, Yu Huang, Yunfeng Lu, Pin Wang, Yi Tang, "Protein Nanocapsule Weaved with Enzymatically Degradable Polymeric Network" **Nano Letters**, 12(4533), 2009.  
- Featured by [Science Daily](#), [World Journal](#), [Nano Werk](#), [C&EN](#).
65. Zhen Gu\*, Suxian Huang, Yong Chen\*, "Biomolecular Nanopatterning by Magnetic Electric Lithography" **Angewandte Chemie International Edition**, 48(952), 2009. **(Cover Feature)**
66. 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.
67. Qianxi Lai, Zhiyong Li, Lei Zhang, Xuema Li, William F. Stickle, Zuhua Zhu, Zhen Gu, Theodore I. Kamins, R. Stanley Williams, Yong Chen\* "An Organic/Si Nanowire Hybrid Field Configurable Transistor", **Nano Letters**, 3 (876), 2008.
68. Zhen Gu, Qun-Dong Shen\*, Juan Zhang, Chang-Zheng Yang, "Dual Electroluminescence from a Single-Component Light-emitting Electrochemical Cell Based on Water-Soluble Conjugated Polymer", **Journal of Applied Polymer Science**, 100 (2930), 2006.
69. Zhen Gu, Yong-Jun Bao, Yang Zhang, Mu Wang, Qun-Dong Shen\* "Enhanced Photoluminescence and Dual Electroluminescence of Anionic Water-Soluble Poly(Phenylene Vinylene) Alternating Copolymer", **Macromolecules**, 39 (3125), 2006.

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[Manuscripts under Review or Invited Manuscripts under Preparation](#)

70. Wujin Sun, Chao Wang, Quanyin Hu, Zhen Gu\*, "Leveraging Physiology for Controlled Drug Delivery", ***Physiological Reviews***. (Invited Article)
71. Chao Wang, Yanqi Ye, Wujin Sun, David Lawrence, John Buse, Zhen Gu\*, "Extremely Fast Glucose-Responsive Insulin Delivery", *submitted to* ***Nature Chemical Biology***, under review.
72. Chao Wang, Wujin Sun, Yanqi Ye, Grace Wright, Andrew Wang, Zhen Gu\*, "Inflammation-Triggered Cancer Immunotherapy by Programmed Delivery", *submitted to* ***Advanced Materials***, in revision.
73. 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", *submitted to* ***Theranostics***, in revision.
74. Jicheng Yu, Yuqi Zhang, Xiuli Hu, Wujin Sun, Chao Wang, Yanqi Ye, Zhen Gu\*, "Endosome Membrane-Coated Nanogel for Targeted Drug Delivery", *submitted to* ***Nanoscale***, revised.
75. Wujin Sun, Wenyan Ji, Quanyin Hu, Jicheng Yu, Chao Wang, Chenggen Qian, Gabrielle Hochu, Zhen Gu\*, "Transformable Nanocarriers for Membrane Targeted Delivery of Cytokines", *submitted to* ***Biomaterials***, under review.
76. Jicheng Yu, Xiuli Hu, Zhen Gu\*, "Glucose-Responsive Insulin Delivery: Opportunities and Challenges", *preparation for* ***Bioengineering and Translational Medicine***, invited article.
77. Chao Wang, Yanqi Ye, Gabrielle M. Hochu, Zhen Gu\*, "Enhanced Cancer Immunotherapy by Microneedle Patch-Assisted Delivery", ***Nano Letters***, revised.
78. Yuqi Zhang, Jicheng Yu, Yong Zhu, Zhen Gu\*, preparation for ***Chemical Reviews***, invited article.
79. Yue Lu, Robert Langer\*, Zhen Gu\*, preparation for ***Nature Reviews Materials***, invited article.

#### • BOOK CHAPTERS

1. Zhen Gu\*, Yi Tang, Yong Chen. "Fabrication of Biomolecular Nanopatterns" Chapter in: F. Columbus "Advances in Nanotechnology". NOVA Scientific Publisher. 2010. **(Invited Review)**
2. Yuyan Weng, 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, *in press*. **(Invited Review)**
3. Wanyi Tai, Zhen Gu\* "Enzyme Nanocapsules for Glucose Sensing and Insulin Delivery" Chapter in: P. Grunwald "Biocatalysis and Nanotechnology". PanStanford Publishing, Singapore, 2014. **(Invited Review)**
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. **(Invited Review)**
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. **(Invited Article)**
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. **(Invited Article)**

#### 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. 62/000,450291***, 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. 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.
10. Zhen Gu, Yue Lu, "Transformable Nanomedicine for Anticancer Drug Delivery", ***NC State Case #: 15092***, 2015.
11. Zhen Gu, Xiaoning Jiang, Jin Di, Jinwoo Kim, "Spatiotemporal Drug Delivery Using Laser-Generated-Focused Ultrasound System", ***NC State Case #: 15293***, 2015.
12. Zhen Gu, Wujin Sun, "Efficient Delivery of CRISPR-Cas9 for Genome Editing via Self-Assembled DNA Nanoclews", ***NC State Case #: 15266***, 2015.
13. Zhen Gu, Yong Zhu, Shanshan Yao, Jin Di, "Stretch-Triggered Drug Delivery Devices", ***NC State Case #: 15261***, 2015.
14. Zhen Gu, Wujin Sun, "DNA Nanoclew for Anticancer Drug Delivery", ***NC State Case #: 15402***, 2016.
15. Zhen Gu, Dennis Pacardo, "Functionalized Gold Nanorods for Cancer Cell Imaging, Drug Delivery and Photothermal Therapy", ***NC State Case #: 14235***, 2014.
16. Zhen Gu, Ran Mo, Tianyue Jiang, "Sequential and Site-Specific Delivery of Multiple Anticancer Therapeutics Using Programmed Nanodepots", ***NC State Case #: 14043***, 2014.
17. Zhen Gu, Ran Mo, "ATP-Triggered Anticancer Drug Delivery", ***NC State Case #: 14036***, 2013.
18. Zhen Gu, Yun Jing, Jin Di, "Ultrasound-Triggered Controlled Drug Delivery Using Injectable Nano-Network", ***NC State Case #: 14037***, 2013.
19. Zhen Gu, Wanyi Tai, "Polymeric Nanovesicle for Self-Regulated Insulin Delivery", ***NC State Case #: 14012***, 2013.
20. Zhen Gu, Yi Tang, Yunfeng Lu, Ming Yan. "Protease-Assisted Photolithography" ***UC.-Case#-086***, 2010.
21. Zhen Gu, Yi Tang. "Photo/Enzyme Synergistically Responsive Matrix" ***UC.-Case#-246***, 2010.
22. Zhen Gu, Yi Tang, Anuradha Biswas, Guoping Fan. "Endoprotease-Mediated Protein Intracellular Delivery" ***UC.-Case#-014***, 2010.
23. Zhen Gu, Yi Tang, "Protein/Hydrogel Based Paper Assay" ***UC.-Case#-211***, 2010.

## INVITED TALKS AND NAMED LECTURES

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1. "Small & Smart Drug Delivery" **Surgery Grand Rounds at UNC Chapel Hill**, Jul. 22, 2015.
2. "Leveraging Physiology for Precise Drug Delivery" **Sigma Aldrich Webinar**, Jun. 22, 2015.
3. "Leveraging Physiology for Precise Drug Delivery", **17th International Drug Delivery Symposium**, Jun. 15, 2015, Salt Lake City, USA.
4. "Smart Insulin Delivery- Inspired by Nature", **75th ADA Annual Meeting**, Jun. 4, 2015, Boston, USA.
5. "Smart Insulin Delivery", **Eli Lilly**, Jun. 2, 2015, Indianapolis, USA.
6. "Programmed Drug Delivery", **"Nanotechnology Workshop" at Duke University**, Apr. 17, 2015, Durham, USA.
7. "Programmed Drug Delivery", **Chemistry Department at University of North Carolina at Charlotte**, Apr. 16, 2015, Charlotte, USA.
8. "Leveraging Physiology for Precise Drug Delivery" **2015 ACS Spring Meeting**, Mar. 22-26, 2015, Denver, CO, USA.
9. "Small but Smart Delivery", **Seminar of MRS Student Chapter at NC State**, Oct. 27, 2014, Raleigh, USA.
10. "Small but Smart Delivery", **American-Chinese Biotechnology Forum at North Carolina**, Oct. 26, 2014, Research Triangle Park, USA.
11. "Smart Insulin Delivery", **Sanofi**, Sep. 4, 2014, Frankfurt, Germany.
12. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Pharmacy, Huazhong University of Science and Technology**, Jul. 10, 2014, Wuhan, China.
13. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Pharmacy, Nanjing Medical University**, Jul. 8, 2014, Nanjing, China.
14. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Advanced Materials, Nanjing Tech University**, Jul. 8, 2014, Nanjing, China.
15. "Physiological Signals-Triggered Controlled Drug Delivery", **School of Chemistry and Chemical Engineering, Nanjing University**, Jul. 7, 2014, Nanjing, China.
16. "Physiological Signals-Triggered Controlled Drug Delivery", **Technical Institute of Physics and Chemistry, CAS**, Jul. 4, 2014, Beijing, China. "Young Scientists Forum"
17. "Physiological Signals-Triggered Controlled Drug Delivery", **National Center for Nanoscience and Nanotechnology**, Jul. 2, 2014, Beijing, China. "Young Scientists Forum in Nanotechnology"
18. "Physiological Signals-Triggered Controlled Drug Delivery", **Department of Pharmacy, Tsinghua University**, Jul. 3, 2014, Beijing, China.
19. "Physiological Signals-Triggered Controlled Drug Delivery", **Molecular Pharmaceutics Division, UNC-CH**, Mar. 7, 2014, Chapel Hill, NC, USA.
20. "Physiological Signals-Triggered Controlled Drug Delivery", **Chemistry Department, UCLA**, Feb. 28, 2014, Los Angeles, CA, USA.
21. "Small But Smart Drug Delivery", **RTP 180°**, Feb. 20, 2014, Research Triangle Park, NC, USA.

22. "Smart Insulin Delivery", **Carolina Science Cafe series, NC Science Festival**, Dec. 4, 2013, Chapel Hill, NC, USA.
23. "Smart Protein Gels", **Department of Pharmaceutical Science at Campbell University**, Nov. 20, 2013, Buies Creek, NC, USA.
24. "Smart Insulin Gels", **the 13th Annual Diabetes Technology Meeting (DTM)**, Nov. 1, 2013, San Francisco, CA, USA.
25. "Smart Protein Gels", **Seminar for Department of Chemical and Biomolecular Engineering, North Carolina State University**, Sep. 10, 2013, Raleigh, NC, USA.
26. "Smart Insulin Gels", **Special Seminar for Department of Endocrinology, University of North Carolina at Chapel Hill**, Jun. 27, 2013, Chapel Hill, NC, USA.
27. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Special Seminar for Graduate Students in Soochow University**, Jun. 4, 2013, Soochow, Jiangsu, China.
28. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Special Seminar in Subei People's Hospital and Yangzhou University**, May. 30, 2013, Yangzhou, Jiangsu, China.
29. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **College of Bioscience and Biomedical Engineering, Southeast University**, May. 29, 2013, Nanjing, Jiangsu, China.
30. "Proteins Gels for Therapeutics and Diagnostics", **School of Biomedical Engineering, Nanyang Technological University**, May. 24, 2013, Singapore.
31. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **the Pharmaceutical Expert Lecture Series in China Pharmaceutical University**, May. 22, 2013, Nanjing, Jiangsu, China.
32. "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.
33. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **Langer Lab Seminar Series in Massachusetts Institute of Technology**, Apr. 11, 2012, Cambridge, MA, USA.
34. "Positioning Proteins into Gels for Therapeutics and Diagnostics", **the Lindbergh Lecture Series in University of Wisconsin-Madison**, Mar. 22, 2012, Madison, WI, USA.
35. "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.
36. "Hydrogel Based Protein Patterning, Encapsulation and Delivery" **Special Seminar for Graduate Students in Nanjing University**, Sep. 16, 2011, Nanjing, Jiangsu, China.
37. "At the Interface of Bio and Nano", **2010 Nagoya University and UCLA Collaboration Conference**, Mar. 4-5, 2010, Los Angeles, CA, USA.
38. "Enzymatically-Triggered Protein Nanocapsules for Intracellular Delivery" **2009 4th Medical Biotech Forum, International Experts Symposium**, Dalian, China, 2009.

## **CONFERENCES PRESENTATIONS**

### **• PEER-REVIEWED CONFERENCE PRESENTATIONS**

1. Zhen Gu, Qun-Dong Shen, Yang Zhang, "Distinct Photophysical Properties of an Anionic Water-Soluble Poly(Phenylene Vinylene) Alternating Copolymer", **Polymer Division of Chinese Chemical Society Annual Conference**, Beijing, China, Oct. 2005. (Oral Presentation)

2. Zhen Gu, Lei Zhang, Zhiping Yu, Xiangqing He, Yong Chen, "Dynamic Bio-Nano System on a CMOS Microarray by Magnetic Electric Patterning" **2009 MRS Spring Meeting**, San Francisco, CA, USA, 2009. (Poster)
3. Zhen Gu, Ming Yan, Juanjuan Du, Yunfeng Lu, Tatiana Segura, Yi Tang, "Enzyme-Responsible Single Protein Encapsulated Nanogels for Intracellular Delivery" **2009 MRS Spring Meeting**, San Francisco, CA, USA, 2009. (Oral Presentation)
4. Yunfeng Lu, Ming Yan, Juanjuan Du, Qi Zhu, Zhen Gu, Yi Tang, "A Novel Intracellular Protein Delivery Platform" **Chemical and Biological Defense Science and Technology (CBD S&T) Conference**, Dallas, TX, USA, Nov. 2009. (Oral Presentation)
5. Ming Yan, Juanjuan Du, Qi Zhu, Zhen Gu, Yunfeng Lu, Yi Tang, "Design of Highly Robust Single Enzyme Biocatalysts" **Chemical and Biological Defense Science and Technology (CBD S&T) Conference**, Dallas, TX, USA, 2009. (Oral Presentation)
6. Zhen Gu, Yong Chen, "Microfluidic-mediated Biomolecular Patterning by Magnetic Electric Nanolithography" **2010 MRS Spring Meeting**, Apr. 4-9, 2010, San Francisco, CA, USA. (Poster)
7. Juanjuan Du, Ming Yan, Zhen Gu, Yi Tang, Yunfeng Lu, "Targeted Delivery of Therapeutic Proteins to Mitochondrial, an Approach Based on Single-Protein Nanocapsules" **2010 MRS Spring Meeting**, Apr. 4-9, 2010, San Francisco, CA, USA. (Oral Presentation)
8. Ming Yan, Juanjuan Du, Zhen Gu, Yi Tang, Yunfeng Lu, "Single Protein Nanocapsules and Their Biomedical Applications" **2010 MRS Spring Meeting**, Apr. 4-9, 2010, San Francisco, CA, USA. (Oral Presentation)
9. Zhen Gu, Anuradha Biswas, Ming Yan, Pin Wang, Yunfeng Lu, Yi Tang, "Photo/Enzyme Synergistically Responsive Gel Matrix" **2010 MRS Spring Meeting**, Apr. 4-9, 2010, San Francisco, CA, USA. (Oral Presentation)
10. Anuradha Biswas, Zhen Gu, Muxun Zhao, Yi Tang, "Development of a Proteolytically Triggered Intracellular Protein Delivery System" **2010 AIChE Annual**, Nov. 8-12, 2010, Salt Lake City, UT, USA. (Oral Presentation)
11. Muxun Zhao, Anuradha Biswas, Zhen Gu, Yi Tang, "Delivery of Protein Nanocapsules to Cancer Cells", **AACR Special Conference: Nano In Cancer**, Jan. 12-15, 2011, Miami, FL, USA. (Poster)
12. Anuradha Biswas, Zhen Gu, Muxun Zhao, Yi Tang, "Endoprotease-mediated Intracellular protein delivery" **241th ACS National Meeting**, Mar. 27-31, 2011, Anaheim, CA, USA. (Poster)
13. Anuradha Biswas, Zhen Gu, Muxun Zhao, Yi Tang, "Endoprotease-mediated Intracellular protein delivery" **Society of Biomaterials, 2011 Annual Meeting**, Apr. 13-16, 2011, Orlando, FL, USA. (Oral Presentation)
14. Wanyi Tai, Zhen Gu, "Biomimetic Vesicles for Glucose-Responsive Insulin Delivery" **Society of Biomaterials, 2014 Annual Meeting**, Apr. 14-19, 2014, Denver, CO, USA. (Poster)
15. Tianyue Jiang, Ran Mo, Zhen Gu, "Gel-Liposome Based Programmed Anticancer Drug Delivery" **Society of Biomaterials, 2014 Annual Meeting**, Apr. 14-19, 2014, Denver, CO, USA. (Oral Presentation)
16. Jin Di, Zhen Gu, "Ultrasound-Mediated Regulation of Blood Glucose Levels" **Society of Biomaterials, 2014 Annual Meeting**, Apr. 14-19, 2014, Denver, CO, USA. (Poster)
17. Jin Di, Zhen Gu, "Ultrasound-Mediated Regulation of Blood Glucose Levels" **2014 ISTU Symposium**, Apr. 2-5, 2014, Las Vegas, NV, USA. (Oral Presentation)
20. Jin Di, Yun Jing, Zhen Gu, "Ultrasound-Triggered Noninvasive Regulation of Blood Glucose-Levels Using Microgels Integrated with Insulin Nanocapsules" **2014 BMES Annual Meeting**, Oct. 22-25, 2014, San Antonio, TX, USA. (Poster)
21. Zhen Gu, Wanyi Tai, Jin Di, Ran Mo, Vinayak Subramanian "Glucose-Responsive Insulin Delivery by Biomimetic Synthetic Vesicles" **2014 BMES Annual Meeting**, Oct. 22-25, 2014, San Antonio, TX, USA. (Oral Presentation)

22. Wujin Sun, Ran Mo, Zhen Gu, "Anticancer Drug Delivery with DNA Nano-Ball" **2014 BMES Annual Meeting**, Oct. 22-25, 2014, San Antonio, TX, USA. (Poster)
23. Dennis Pacardo, Bhanu Neupane, Michaela Rikard, Yue Lu, Ran Mo, Gufeng Wang, Frances Ligler, Zhen Gu, "Functionalization of Gold Nanorods for Cancer Cell Imaging, Drug Delivery and Photothermal Therapy" **2014 BMES Annual Meeting**, Oct. 22-25, 2014, San Antonio, TX, USA. (Oral Presentation)
24. Dennis Pacardo, Frances Ligler, Zhen Gu, "Functionalization of Gold Nanorods for Cancer Cell Imaging, Drug Delivery and Photothermal Therapy" **2014 Gordon Conference**, Jun. 15-20, 2014, South Hadley, MA, USA. (Poster)
25. Dennis Pacardo, Frances Ligler, Zhen Gu, "Functionalization of Gold Nanorods for Cancer Cell Imaging, Drug Delivery and Photothermal Therapy" **2015 MRS Spring Meeting**, Apr. 6-10, 2015, San Francisco, CA, USA. (Poster)
26. Zhen Gu, "Smart Insulin Delivery Using Bio-inspired Vesicles" **2015 MRS Spring Meeting**, Apr. 6-10, 2015, San Francisco, CA, USA. (Oral Presentation)
27. Wujin Sun, Zhen Gu, "DNA Nano-Cocoon for Bioinspired Delivery of Anticancer Therapeutics" **2015 MRS Spring Meeting**, Apr. 6-10, 2015, San Francisco, CA, USA. (Poster)
28. Yue Lu, Zhen Gu, "Redox/Acid Dual Responsive Polymeric Nanocomposites" **2015 MRS Spring Meeting**, Apr. 6-10, 2015, San Francisco, CA, USA. (Poster)
29. Jin Di, Zhen Gu, "Ultrasound-Mediated Insulin Delivery" **2015 MRS Spring Meeting**, Apr. 6-10, 2015, San Francisco, CA, USA. (Poster)
30. Wujin Sun, Zhen Gu, "DNA Nano-Cocoon for Bioinspired Delivery of Anticancer Therapeutics" **2015 ACS Spring Meeting**, Mar. 22-26, 2015, Denver, CO, USA. (Oral Presentation)
31. Zhen Gu, "Synergistic Anticancer Therapeutics Using Gold Nanorods" **2015 ACS Spring Meeting**, Mar. 22-26, 2015, Denver, CO, USA. (Invited Oral Presentation)
32. Wujin Sun, Ran Mo, Zhen Gu, "ATP-Responsive DNA/Graphene Nanoaggregates for Enhanced Control Drug Delivery" **2015 Biomaterials Annual Meeting**, Mar. 16-19, 2015, Charlotte, NC, USA. (Oral Presentation)

#### • OTHER PROCEEDINGS/SYMPOSIA PRESENTATIONS

1. Qianxi Lai, Lei Zhang, Zhen Gu, *et al.* "Ionic-doping Based Configurable Electronic Devices-Organic Nonvolatile Memory and Field-Configurable Transistor" **California NanoSystems Institute (CNSI) Conference and Grand Opening**, Los Angeles, CA, USA, Dec. 14, 2007. (Poster)
2. Zhen Gu, Suxian Huang, Yong Chen, "Magnetic Biomolecular Nanopatterning by Magnetic Electric Lithography" **The 5th FCRP FENA Annual Review**, Los Angeles, CA, Jan. 2009. (Poster)
3. Zhen Gu, Anuradha Biswas, Yi Tang, "Cocoon-like Protease-Assisted Native-protein Delivery Approach (PANDA)" **2010 UCLA Engineering Tech Forum**, Feb. 11, 2010, Los Angeles, CA, USA. (Poster)
4. Zhen Gu, Yi Tang, Daniel Anderson, Robert Langer "Engineering Hydrogel Based Platforms for Protein Positioning and Delivery", **2011 BMES Annual Meeting**, Oct. 12-15, 2011, Hartford, CT, USA. (Poster)

#### RESEARCH MENTORING

##### • Postdoctoral Researchers

- Wanyi Tai, Ph.D. (2012-2013)
  - Ran Mo, Ph.D. (2012-2014)
- Jiangsu Province-Specially Appointed Full Professor, China**
- Dennis Pacardo, Ph.D. (co-advised with Frances Ligler, 2013-present)
  - Chao Wang, Ph.D. (2015-present)

### • Graduate Students

- Jicheng Yu (2014-present, Ph.D. expected 2019)
- Quanyin Hu (2014-present, Ph.D. expected 2019)
- Yanqi Ye (2014-present, M.S. expected 2016)

#### *BME Annual Retreat- Best Oral Presentation Award*

- Yue Lu (2013-present, Ph.D. expected 2018)
- Wujin Sun (2013-present, Ph.D. expected 2018)
- Jin Di (2012-2015, Ph.D.)

#### *UNC Impact Award; Leaf Huang Poster Award (Pharmacoengineering Conference); Best Oral Presentation Award of the University Graduate Research Day (UNC); Student Travel Award for the 2014 International Society for Therapeutic Ultrasound (ISTU) Conference*

- Rocco DiSanto (2012-2014, M.S.)

### • Undergraduate Students

- Gabrielle Hochu (2014-present, B.S. expected 2017)
- Hunter Bomba (2014-present, B.S. expected 2017)

#### *NC State-Abrams Scholar*

- Davis Ranson (2014-present, B.S. expected 2017)

#### *NC State-Abrams Scholar*

- Balaji Lenin (2014-present, B.S. expected 2017)
- Apoorva Thatavarty (2014-present, B.S. expected 2017)
- Yuqi Zhang (2014-present, B.S. expected 2015)
- Abby Jindal (2013-present, B.S. expected 2016)
- Okello Bogle (2013-present, B.S. expected 2015)
- Maggie Reiff (2013-present, B.S. expected 2015)
- Michaela Rikard (2013-present, B.S. expected 2016)
- Emily Nguyen (2013-present, B.S. expected 2016)
- Jennifer Price (2012-present, B.S. expected 2014)
- Vinayak Subramanian (2012-present, B.S. expected 2015)

#### *NC State-Abrams Scholar*

- Adriano Bellotti (2012-present, B.S. expected 2015)

#### *NC State-Abrams Scholar*

- Tianfei Liu (2010, UCLA Cross-Disciplinary Scholars in Science and Technology (CSST) programs)

### • Visiting Scholars

- Tianyue Jiang (2012-2014, Ph.D. expected 2014, Ph.D. student from China Pharmaceutical University)
- 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 Rachele (Ph.D., 2013-present, Chair: Joseph M. DeSimone, Chemistry at UNC-CH)
- Justin Johnson (Ph.D., 2013-present, Chair: Mark Schoenfisch, 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 Spring, Instructor, UNC-CH/NC State

Lecture: Advanced Drug Delivery Systems (BME590) [Rating: 4.6/5.0](#)

### • 2013-2014 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**

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### • **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), 2011-2013  
 Member of American Chemical Society (ACS), 2007-2008

### • **Editorships**

#### Editorial Board

*Scientific Reports (IF=5.6)*  
*Journal of Biomedical Technology and Research*  
*Journal of Bioelectronics and Nanotechnology*  
*Journal of Drug Design and Clinical Trials*  
*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  
 SMART Innovation Center, Singapore  
 Agency for Science, Research & Technology (A\*STAR), Singapore

### • **Symposium Organizers/Chairs**

#### Symposium Organizer/Co-Organizer

“Nanomedicines: Targeting and Clearance”, 274<sup>th</sup> ACS Annual Spring Meeting, Dallas, 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 Communications*  
*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".



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**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).