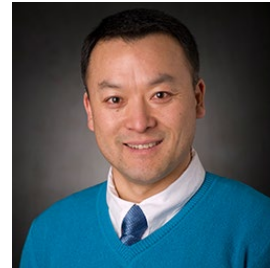


Dr. Yong Wang, Professor

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<http://www.bioe.psu.edu/labs/Wang-Lab/>



EDUCATION

- 05/2004 **Ph.D. in Biomedical Engineering**
Certificate in Biomolecular & Tissue Engineering
Duke University, Durham, NC. Advisor: *Prof. Fan Yuan*.
- 06/1998 **M.S. in Chemical Engineering**
Chinese Academy of Sciences, Dalian Institute of Chemical Physics,
Dalian, China. Advisor: *Prof. Xiaojun Ma*.
- 06/1995 **B.S. in Environmental Chemistry**
Jilin University, Changchun, China.

WORKING EXPERIENCE

Penn State University:

- 05/2020 – present Member, Center for Infectious Disease Dynamics, the Huck Institutes of the Life Sciences
- 07/2016 – present **Professor of Biomedical Engineering**
- 02/2015 – present Member, Molecular, Cellular and Integrative Biosciences Program, the Huck Institutes of the Life Sciences
- 01/2013 – 06/2016 Associate Professor of Biomedical Engineering

University of Connecticut:

- 09/2011 - 12/2012 **Associate Professor of Chemical and Biomolecular Engineering**
- 12/2010 - 12/2012 Affiliated Faculty of Connecticut Institute for Clinical and Translational Science
- 01/2010 - 12/2012 Affiliated Faculty of Stem Cell Research Institute
- 05/2007 - 12/2012 Affiliated Faculty of Institute of Materials Science
- 01/2007 - 12/2012 Core Faculty of Biomedical Engineering
- 08/2006 - 08/2011 **Assistant Professor of Chemical and Biomolecular Engineering**

Duke University:

- 12/2004 - 08/2006 **Research Associate**; Duke University Medical Center
- 06/2004 - 11/2004 **Postdoctoral Fellow**; Duke Biomedical Engineering

RESEARCH INTERESTS

Programmable hydrogels; Cell medicine engineering; Regenerative medicine; Immunoengineering; Vascularization

LEADERSHIP ROLES & AWARDS/HONORS

| | | |
|------|--|---|
| 2021 | Chair | NIH Study Section ZRG1 BST-M (50) |
| 2021 | Associate Editor | Research (Science partner journal) |
| 2021 | Co-chair | Penn State BME/EMS Faculty Search |
| 2020 | Co-chair | 2020 Northeastern Bioengineering Conference |
| 2015 | Chair | BME Graduate Admission |
| 2020 | External Faculty Awards Recognition, Penn State College of Engineering | |
| 2019 | Outstanding Research Award, Penn State Engineering Alumni Society | |
| 2019 | Invitational Fellow, Japan Society for the Promotion of Sciences | |
| 2017 | Fellow, American Institute for Medical and Biological Engineering | |
| 2012 | CREATIV Award, National Science Foundation | |
| 2010 | CAREER Award, National Science Foundation | |

AWARDS/HONORS RECEIVED BY ADVISEES

- Kyungsene Lee – Penn State CTSI -Summer Translational Science Fellowship, 2021
- Lidya Abune – Recipient of Harry G. Miller Fellowship in Engineering, 2020
- Peng Shi – CAB Trainee Award, 2020
- James Coyne – Recipient of the Diefenderfer Graduate Fellowship for engineering, business, and entrepreneurship, 2020
- Lidya Abune – Receipt of Julia D. Erdley Graduate Scholarship, 2019
- Lidya Abune – Penn State CTSI -Summer Translational Science Fellowship, 2018
- David Kauffman - Recipient of The Douglas and Regina Evans Award for Research, 2018
- Brandon Davis – Rodney A. Erickson Discovery Award, 2017
- David Kauffman - Rodney A. Erickson Discovery Award, 2017
- Erin Gaddes – John C. and Joanne H. Villforth Fellowship, Penn State, 2015
- Erin Gaddes - the first place award in the student poster competition, Penn State BME. 2015
- Shihui Li - the second place award in the student poster competition, Penn State BME. 2015
- Erin Gaddes - College of Engineering Research Symposium First-Place Paper/Presentation Award, Penn State, 2015
- Alex Chan – CERI REU Award, College of Engineering, Penn State, 2015
- Gregory Gydush – CERI REU Award, College of Engineering, Penn State, 2014
- Kelsey Boch – SURF Award, The University of Connecticut, 2012
- Shihui Li – Oversea Study Fellowship from China Scholarship Council, 2011
- Boonchoy Soontornworajit – Doctoral Dissertation Fellowship, The University of Connecticut, 2011
- Niancao Chen – Oversea Study Fellowship from China Scholarship Council, 2010
- Jing Zhou – Doctoral Dissertation Fellowship, The University of Connecticut, 2010
- Congtin Phan - SURF Award, The University of Connecticut, 2010

PUBLICATIONS (JOURNAL AND BOOK)

Representative Publications

- P. Shi, **Y. Wang** *
Synthetic DNA for cell surface engineering. *Angewandte Chemie International Edition*. 2021, 133 (21), 11684-11695. [We summarized recent progress and future challenges on](#)

using DNA nanotechnologies to functionalize the surface of cells (e.g., immune cells) for various biomedical applications such as cancer immunotherapy and regenerative medicine.

- P. Shi, X. Wang, B. Davis, J. Coyne, C. Dong, **Y. Wang** *
In situ synthesis of an aptamer-based polyvalent antibody mimic on the cell surface for enhanced interactions between immune and cancer cells. **Angewandte Chemie International Edition**. 2020, 59 (29), 11892-11897. [This paper shows that nucleic acids can be applied to build up synthetic, polyvalent receptors to promote immune cells to recognize cancer cells with enhanced recognizing and killing efficacy.](#)
- P. Shi, N. Zhao, J. Coyne, **Y. Wang***
DNA-templated synthesis of biomimetic cell wall for nanoencapsulation and protection of live cells. **Nature Communications** 2019, 10: 2223
- Zhang, Z, Chen, N., Li, S., Battig, M.R., **Wang Y.***
Programmable hydrogels for controlled cell catch and release using hybridized aptamers and complementary sequences. **Journal of the American Chemical Society**. 2012, 134, 15716-15719.
- Battig, M.R., Soontornworajit, B., **Wang Y.***
Programmable release of multiple protein drugs from aptamer-functionalized hydrogels via nucleic acid hybridization. **Journal of the American Chemical Society**. 2012, 134, 12410-12413. [This paper shows the application of aptamers to control the release of multiple proteins in a sequentially triggered manner. This technology is under investigation for applications such as cancer immunotherapy and regenerative medicine.](#)
- Soontornworajit, B., Zhou, J., Shaw, M.T., Fan, T.H., **Wang, Y.***
Hydrogel functionalization with DNA aptamers for sustained PDGF-BB release. **Chemical Communications**. 2010; 46: 1857–1859. [Our lab has pioneered the development of aptamer-based affinity hydrogels to tackle the long-term challenges faced by controlled protein release. This paper shows the first evidence that aptamer can be applied to control protein release in a sustained manner. This technology holds great potential for applications such as cancer immunotherapy and regenerative medicine.](#)

07/2016-present (Full Professor)

| <u>As (co) corresponding author</u> * | | |
|--|---------------|------------------|
| Journal | Impact factor | Number of papers |
| Angewandte Chemie International Edition | 15.336 | 4 |
| Nature Communications | 14.920 | 1 |
| Trends in Pharmacological Sciences | 14.819 | 1 |
| Journal of Allergy and Clinical Immunology | 14.110 | 1 |
| Biomaterials | 12.479 | 1 |
| Chemical Science | 9.825 | 1 |
| Chemistry of Materials | 9.811 | 2 |
| Journal of Controlled Release | 9.776 | 1 |
| ACS Applied Materials & Interfaces | 9.229 | 3 |
| WIREs Nanomedicine and Nanobiotechnology | 9.182 | 1 |
| Macromolecular Bioscience | 4.979 | 1 |
| ACS Biomaterials Science & Engineering | 4.749 | 3 |
| <u>As co-author</u> | | |
| Journal | Impact factor | Number of papers |
| Journal of Biomedical Nanotechnology | 4.483 | 1 |
| ACS Biomaterials Science & Engineering | 4.749 | 1 |
| Sensors | 3.576 | 1 |

2021

1. L. Abune, B. Davis, Y. Wang *
Aptamer-functionalized hydrogels: an emerging class of biomaterials for protein delivery, cell capture, regenerative medicine and molecular biosensing (invited)
WIREs Nanomedicine and Nanobiotechnology. 2021; e1731
2. L. Abune, Y. Wang *
Affinity hydrogels for protein delivery (invited)
Trends in Pharmacological Sciences. 2021. 42 (4) 300-312
3. P. Shi, Y. Wang *
Synthetic DNA for cell surface engineering (invited)
Angewandte Chemie International Edition. 2021, 133 (21), 11684-11695
4. C. Li,[§] M. Xu,[§] J. Coyne,[§] J. Yang, W.B. Wang, M. Devila, Y. Wang *, N. Xiong *
CCL27/CCR10-derived regulatory signals suppress over-activation of IL-17A/IL-22-producing skin T cells and skin inflammation (§: *co-first authors*; *: *co-responding authors*)
Journal of Allergy and Clinical Immunology. 2021. 147 (2), 759-763. e9

2020

5. J. Zhou, Y. Wang *
Cell recognition-inspired aptamer-based nanomaterials.
In Y. Xie (Ed), **The Nanobiotechnology Handbook**. Novato: CRC Press. *In press*.
6. N. Zhao, J. Coyne, L. Abune, P. Shi, X.L. Lian, G. Zhang, Y. Wang *
Exogenous signaling molecules released from aptamer-functionalized hydrogels promote the survival of mesenchymal stem cell spheroids
ACS Applied Materials & Interfaces. 2020, 12, 22, 24599-24610
7. Y. Wang, D. Kaplan
Special issue: leaders in biomedical engineering. (**Editorial**)
ACS Biomaterials Science & Engineering. 2020, 6 (5), 2495-2497
8. P. Shi, X. Wang, B. Davis, J. Coyne, C. Dong, Y. Wang *
In situ synthesis of an aptamer-based polyvalent antibody mimic on the cell surface for enhanced interactions between immune and cancer cells
Angewandte Chemie International Edition. 2020, 59 (29), 11892-11897
9. J. Coyne, N. Zhao, A. Olubode, M. Menon, Y. Wang *
Development of hydrogel-like biomaterials via nanoparticle assembly and solid-hydrogel transformation.
Journal of Controlled Release. 2020, 318, 185-196.

2019

10. H. Chen, S. Agrawal, A. Dangi, C. Wible, M. Osman, L. Abune, H. Jia, R. Rossi, Y. Wang, S. Kothapalli*
Optical-resolution photoacoustic microscopy using transparent ultrasound transducer.
Sensors. 2019, 19, 5470
11. O. Juhl IV, N. Zhao, A. Merife, D. Cohen, M. Friedman, Y. Zhang, Z. Schwartz, Y. Wang, H. Donahue*

Aptamer-functionalized fibrin hydrogel improves vascular endothelial growth factor release kinetics and enhances angiogenesis and osteogenesis in critically sized cranial defects.

ACS Biomaterials Science & Engineering. 2019, 5,11, 6152-6160

12. P. Shi, N. Zhao, J. Coyne, **Y. Wang***
DNA-templated synthesis of biomimetic cell wall for nanoencapsulation and protection of live cells.
Nature Communications. 10: 2223 (2019)
13. L. Abune, N. Zhao, J. Lai, B. Peterson, S. Szczesny, **Y. Wang***.
Macroporous hydrogels for stable sequestration and sustained release of VEGF and bFGF using nucleic acid aptamers.
ACS Biomaterials Science & Engineering. 2019, 5(5), 2382-2390.
14. N. Zhao, A. Suzuki, X. Zhang, P. Shi, L. Abune, J. Coyne, H. Jia, N. Xiong, G. Zhang, **Y. Wang***.
Dual Aptamer-functionalized *In Situ* Injectable Fibrin Hydrogel for Promotion of Angiogenesis via Co-delivery of VEGF and PDGF-BB
ACS Applied Materials & Interfaces. 2019, 11, 20, 18123-18132
15. N. Zhao, J. Coyne, A. Suzuki, M. Xu, X. Zhang, P. Shi, J. Lai, N. Xiong, G.H., Fong, **Y. Wang***
Assembly of Bifunctional Aptamer-Fibrinogen Macromer for VEGF Delivery and Skin Wound Healing.
Chemistry of Materials. 2019, 31(3), 1006-1015.
16. J. Lai, N. Zhao, L. Abune, **Y. Wang***
Programmed degradation of hydrogels with a double-locked domain.
Angewandte Chemie International Edition. 2019, 58, 2820-2825

2018

17. **Wang, Y.***
Programmable Hydrogels (*Invited review*).
Biomaterials. 2018,178, 663-680.
18. Shi, P., Zhao, N., Lai, J., Coyne, J., Gaddes, E.R., **Wang, Y.***
Polyvalent display of biomolecules on live cells (*Inside Cover*).
Angewandte Chemie International Edition. 2018, 57 (23), 6800-6804.

2017

19. Coyne, J., Davis, B., Kauffman, D., Zhao, D., **Wang, Y.***
Polymer microneedle mediated local aptamer delivery for blocking the function of VEGF
ACS Biomaterials Science & Engineering. 2017, 3(12), 3395-3403.
20. Lai, J., Li, S., Shi, X., Coyne, J., Zhao, N., Dong, F., Mao, Y., **Wang, Y.***
Displacement and hybridization reactions in aptamer-functionalized hydrogels for biomimetic protein release and signal transduction (*Inside Cover*).
Chemical Science. 2017, 8 (11), 7306-7311.
Highlighted: Science 360 (NSF), Science Daily, Penn State News, etc.
21. Zhao, N., Battig, M.R., Xu, M., Wang, X., Xiong, N., **Wang, Y.***
Development of a dual-functional hydrogel using RGD and anti-VEGF aptamer.

- Macromolecular Bioscience.** 2017, 17, 1700201
22. Lai, J., Jiang, P., Gaddes, E.R., Zhao, N., Abune, L., **Wang, Y.***
Aptamer-functionalized hydrogel for self-programmed protein release via sequential photoreaction and hybridization.
Chemistry of Materials. 2017, 29(14), 5850-5857.
23. Jiang, P., Li, S., Lai, J., Zheng, H., Lin, C., Shi, P., **Wang, Y.***
Nanoparticle-programmed surface for drug release and cell regulation via reversible hybridization reaction.
ACS Applied Materials & Interfaces. 2017, 9(5), 4467-4474.

2016

24. Aresh, W., Liu, Y., Sine, J., Thayer, D., Puri, A., Huang, Y., **Wang, Y., Nieh, M.***
Morphological dependence of lipid-based nanoparticles in cancer cellular uptake: preferential internalization of nanodiscs over vesicles
Journal of Biomedical Nanotechnology. 2016,12, 1852-1863.

Tenured Associate Professor

2016

25. Chen, N., Shi, X., **Wang Y.***
Molecularly regulated reversible DNA polymerization (**Hot Paper**)
Angewandte Chemie International Edition. 2016, 55 (23) 6657-6661
26. Zhang, X., Battig, M.R., Chen, N., Gaddes, E.R., Duncan, K.L., **Wang Y.***
Chimeric aptamer-gelatin hydrogels as an extracellular matrix mimic for loading cells and growth factors
Biomacromolecules. 2016, 17(3), 778-787

2015

27. Li S, Chen, N., Gaddes E.R., Zhang, X., Dong, C., Chen N, **Wang Y.***
A Drosera-bioinspired hydrogel for catching and killing cancer cells
Scientific Reports. 2015, 5, 14297.
28. Li S, Gaddes ER, Chen N, **Wang Y.***
Molecular encryption and reconfiguration for remodeling of dynamic hydrogels
Angewandte Chemie International Edition. 2015, 54(20), 5957-5961.
29. Gaddes ER, Gydush G, Li S, Chen N, Dong C, **Wang Y.***
Aptamer-based polyvalent ligands for regulated cell attachment on the hydrogel surface.
Biomacromolecules 2015, 16 (4), 1382-1389.
30. Gaddes ER, Lee D, Gydush G, **Wang Y, Dong C***
Regulation of Fibrin-Mediated Tumor Cell Adhesion to the Endothelium using Anti-Thrombin Aptamer
Experimental Cell Research. 2015, 339(2), 417-426.
31. Ozdemir T, Richards E, **Wang Y, Dong C***
Perspectives: Interplay between melanoma regulated fibrin and receptor mediated adhesion under shear flow.
Cellular and Molecular Bioengineering. 2015, 8(1), 86-95.

32. Battig, M., Zhou, J. Wang, Y.* Nucleic Acid Aptamers in Drug Delivery. In J. Bronzino & D. Peterson (Eds.), **Handbook of Biomedical Engineering, Fourth Edition** (pp.TBD). Novato: CRC Press. 2015

2014

33. Richards E., Li S, Battig MR, Wang Y.*
Polymerization of affinity ligands on a surface for enhanced ligand display and cell binding
Biomacromolecules 2014, 15, 4561-4569
34. Chen N, Huang Y, Wang Y.*
Bioinspired affinity DNA polymers on nanoparticles for drug sequestration and detoxification
Biomaterials. 2014, 35(36), 9709-9718.
35. Battig MR, Huang Y, Chen N, Wang Y.*
Aptamer-functionalized superporous hydrogels for sequestration and release of growth factors regulated via molecular recognition
Biomaterials. 2014, 35, 8040-8048.
36. Huang, Y., Wang, Y.* Aptamer-functionalized nanomaterials for biological and biomedical applications. In B Bhushan, D. Luo, S.R. Schrickler, W. Sigmund, S. Zauscher (Eds), **Handbook of Nanomaterials Properties** (pp 1159-1176). Springer. 2014
37. Battig, M.R., Wang, Y.* Nucleic acid aptamers for biomaterials development. In S. Kumber, C.T. Laurencin, and D. Meng (Eds), **Natural and Synthetic Biomedical Polymers** (pp 287-299). Elsevier. 2014

2013

38. Chen, N., Li, S., Battig, M.R., Wang Y.*
Programmable imaging amplification via nanoparticle-initiated DNA polymerization
Small. 2013, 9(23): 3944-3949.
39. Zhang, X., Battig, M.R., Wang Y.*
Programmable hydrogels for the controlled release of therapeutic nucleic acid aptamers via reversible DNA hybridization
Chemical Communications. 2013, 49(83), 9600-9602.
40. Zhang, Z., Li,S., Chen, N., Yang, C. Wang Y.*
Programmable display DNA-protein chimeras for controlling cell-hydrogel interactions via reversible intermolecular hybridization
Biomacromolecules. 2013, 14 (4), 1174-1180.
41. Li, S., # Chen, N., # Zhang, Z, Wang Y.*
Endonuclease-responsive aptamer-functionalized hydrogel coating for sequential catch and release of cancer cells.
Biomaterials. 2013, 34, 460-469.
42. Fu K, Li S., Wang Y., Willis BG*
DNA gold nanoparticle nanocomposites film for chemiresistive vapor sensing
Langmuir. 2013, 29 (46) 14335-14343.
43. Zhou, J., Wang, Y.* Aptamer-functionalized nanomaterials for cell recognition. In Y.

Xie (Ed), *The Nanobiotechnology Handbook* (pp 31-41). Novato: CRC Press. 2013

44. **Wang, Y.*** In Vitro Assessment of Cell-Biomaterial Interactions. In C. Laurencin & Y. Khan (Eds.), *Regenerative Engineering* (pp. 151-163). Novato: CRC Press. 2013

2012

45. Zhang, Z, Chen, N., # Li, S., # Battig, M.R., # **Wang Y.***
Programmable hydrogels for controlled cell catch and release using hybridized aptamers and complementary sequences
Journal of the American Chemical Society. 2012, 134, 15716-15719.
46. Battig, M.R., # Soontornworajit, B., # **Wang Y.***
Programmable release of multiple protein drugs from aptamer-functionalized hydrogels via nucleic acid hybridization.
Journal of the American Chemical Society. 2012, 134, 12410-12413.
Highlighted: C&EN and the RSC's Chemistry World Magazine.
47. Chen, N. #, Zhang, Z., Soontornworajit, B. #, Zhou, J. #, **Wang, Y.***
Cell adhesion on an artificial extracellular matrix using aptamer-functionalized PEG hydrogels.
Biomaterials. 2012, 33: 1353-1362.
48. Zhang, X. # Soontornworajit, B., # Zhang, Z., Chen, N., # **Wang Y.***
Enhanced loading and controlled release of antibiotics using nucleic acids as an antibiotic-binding effector in hydrogels.
Biomacromolecules. 2012, 13 (7): 2202-2210.
49. Li L., Crosby K., Sawicki M., **Shaw LL,* Wang Y.**
Effects of surface roughness of hydroxyapatite on cell attachment and proliferation.
Journal of Biotechnology and Biomaterials. 2012, 2 (150), 2.

2011

50. Soontornworajit, B. , Zhou, J. , Snipes M., Battig, M. , **Wang, Y.***
Affinity hydrogels for controlled protein release using nucleic acid aptamers and complementary oligonucleotides.
Biomaterials. 2011, 32: 6839-6849.

Tenure-Track Assistant Professor/Postdoc/Graduate Student

51. Fan, T.H.* , Soontornworajit, B. , Karzar-Jeddi, M., **Wang, Y.***
An Aptamer-functionalized hydrogel for controlled protein release: a modeling study.
Soft Matter. 2011,7:9326-9334.
52. Cao, W., Zhou, J. , Mann, A., **Wang, Y. ***, Lei Zhu.*
Folate-functionalized unimolecular micelles based on a biodegradable amphiphilic dendrimer-like star polymer for cancer cell-targeted drug delivery.
Biomacromolecules. 2011, 12 (7): 2697-2707.
53. Soontornworajit, B. , **Wang, Y.***
Nucleic acid aptamers for clinical diagnosis: cell detection and molecular imaging.
Analytical and Bioanalytical Chemistry. 2011, 399:1591-1599. (**Invited review**)
54. Zhou, J. , Soontornworajit, B. , Snipes, M. , **Wang, Y.***

- Structural prediction and binding analysis of hybridized Aptamers.
Journal of Molecular Recognition. 2011, 24:119-126.
55. Cao, W., Zhou, J., **Wang, Y.***, Lei Zhu.*
Synthesis and in vitro cancer cell targeting of folate-functionalized biodegradable amphiphilic dendrimer-like star polymers.
Biomacromolecules. 2010, 11, 3680-3687.
 56. Soontornworajit, B., Zhou, J., Zhang, Z., **Wang, Y.***
Aptamer-functionalized *in situ* injectable hydrogel for controlled protein release.
Biomacromolecules. 2010, 11, 2724-2730.
 57. Zhou, J., Battig, M., **Wang, Y.***
Aptamer-based molecular recognition for biosensor development.
Analytical and Bioanalytical Chemistry. 2010. 398:2471-2480. (*Invited review*)
 58. Soontornworajit, B., Zhou, J., **Wang, Y.***
A hybrid particle-hydrogel composite for oligonucleotide-mediated pulsatile protein release.
Soft Matter. 2010, 6, 4255-4261.
 59. Zhou, J., Soontornworajit, B., **Wang, Y.***
A temperature-responsive antibody-like nanostructure.
Biomacromolecules. 2010. 11: 2087-2093.
 60. Soontornworajit, B., Zhou, J., Shaw, M.T., Fan, T.H., **Wang, Y.***
Hydrogel functionalization with DNA aptamers for sustained PDGF-BB release.
Chemical Communications. 2010; 46: 1857-1859.
 61. Zhou, J., Soontornworajit, B., Martin, J., Sullenger, B.A., Gilboa, E., **Wang, Y.***
A hybrid DNA aptamer-dendrimer nanomaterial for targeted cell labeling.
Macromolecular Bioscience. 2009; 9: 831-835.
 62. Zhou, J., Soontornworajit, B., Snipes, M., **Wang, Y.***
Development of a novel pretargeting system with bifunctional nucleic acid molecules. ***Biochemical and Biophysical Research Communications***. 2009; 386: 521-525]
 63. Zhou, J., Xu, R.H., **Wang, Y.***
Nanoporous membrane-encapsulated feeder cells for culture of human embryonic stem cells.
International Journal of Functional Informatics and Personalized Medicine. 2009; 2(1): 77-88.
 64. **Wang, Y.***
Engineering strategies for drug delivery.
IEEE Engineering in Medicine and Biology Magazine. 2009; 28(1): 10-11. (*Editorial*)
 65. Lin, C.W., Wang, Y., Challa, P., Epstein, D.L. Yuan, F.
Transscleral diffusion of ethacrynic acid and sodium fluorescein.
Molecular Vision. 2007; 13: 243-251.
 66. McNamara, II J.O., Andrechek, E.R., Wang, Y., Viles, K.D., Rempel, R.E., Gilboa, E., Sullenger, B.A., Giangrande, P.H.
Cell-type specific delivery of siRNA with aptamer-siRNA chimeras.
Nature Biotechnology. 2006; 24(8) 1005-1015. (equally contributed)

67. Wang, Y., Yuan, F.
Delivery of viral vectors to tumor cells: Extracellular transport, systemic distribution, and strategies for improvement.
Annals of Biomedical Engineering. 2006; 34(1): 114-127]
68. Wang, Y., Wang, H., Li, C.Y., Yuan, F.
Effects of rate, volume, and dose of intratumoral infusion on virus dissemination in local gene delivery.
Molecular Cancer Therapeutics. 2006; 5(2):362-366.
69. Wang, Y., Chen, Q., Yuan, F.
Alginate encapsulation is a highly reproducible method for tumor cell implantation in dorsal skinfold chamber.
Biotechniques. 2005; 39(6): 834-838. (equally contributed)
70. Wang, Y., Liu, S., Li, C.Y., Yuan, F.
A novel method for viral gene delivery in solid tumors.
Cancer Research. 2005; 65(17):7541-7545]
71. Wang, Y., Yang, Z., Liu, S., Kon, T., Li, C.Y., Yuan, F.
Characterization of systemic dissemination of non-replicating adenoviral vectors from tumors in gene delivery.
British Journal of Cancer. 2005; 92 (8): 1414-142]
72. Wang, Y., Challa, P., Epstein, D.L., Yuan, F.
Controlled release of ethacrynic acid from poly (lactide-co-glycolide) films for glaucoma treatment.
Biomaterials. 2004; 25(18): 4279-85.
73. Wang, Y., Hu, J.K., Krol, A., Li, Y.P., Li, C.Y., Yuan, F.
Systemic dissemination of viral vectors during intratumoral injection.
Molecular Cancer Therapeutics. 2003; 2: 1233-1242]
74. Ma, X.J. *, Xie, Y.B., Wang, Y. Controlled Release and Microcapsule Membranes. In J. Shi, Q. Yuan, & C. Gao (Eds), ***Handbook of Membrane Science & Technology*** (pp. 807-827). Beijing: Chemical Industry Press. 2001
75. He, Y., Xie, Y.B., Wang, Y., Liu, Q., Ma, X.J.
Improved Mathematical Model of APA Microcapsules.
Chemical Research in Chinese Universities. 2000; 21(2): 278-28]
76. Wang, Y., He, Y., Liu, Q., Li, J., Ma, X.J.
Deacetylation of chitosan films.
Chemical Journal on Internet. [2000/02b051ne](#) (Chinese journal)
77. Wang, Y., Li, M., Ma, X.J.
Influence of reaction time on the preparation of alginate/chitosan microcapsule.
Chemical Journal on Internet. [1999/c99060](#) (Chinese journal)
78. Wang, Y., Xie, Y.B., Ma, X.J.
Progress in studying alginate/chitosan microcapsules.
Progress in Biotechnology. 1999; 19 (2), 13-20. (Chinese journal)

FUNDING

❖ [Active Grants](#)

| | | |
|--|--|-------------|
| 06/2020-05/2024 NIH R01 | Aptamer-functionalized cardiac patches <u>Role: PI; with C. Zhang (co-investigator)</u> | \$2,138,948 |
| 05/2018-12/2023 no cost extension NIH R01 | Semi-synthetic biomaterials for skin wound healing <u>Role: PI; with Xiong N (co-investigator)</u> | \$2,119,745 |
| 09/2019-12/2023 NIH R01 Supplement | Semi-synthetic biomaterials for skin wound healing <u>Role: PI</u> | \$133,672 |
| 07/2018-06/2022 no cost extension NSF | Growth of hybrid polymeric nanostructures for enzyme-free amplified protein imaging <u>Role: PI</u> | \$ 318,696 |
| 09/2019-08/2022 NSF | IIBR Instrumentation: Collaborative Research: Development of a single-biomolecule detection instrument via digital counting of nanoparticles <u>Role: PI (100%)</u> | \$180,000 |
| 07/2019-06/2022 no cost extension AHA | Programmable Drug-Releasing Surface for Anti-thrombosis <u>Role: Co-PI (50%); with K Manning (PI)</u> | \$200,000 |
| 03/2020 Penn State | An enzyme-free, antibody-free and PCR-free DNA-based method for rapid, sensitive and ambient detection of SARS-CoV-2 <u>Role: PI</u> | \$55,000 |
| 04/2020 Penn State | Suppression of SARS-CoV-2 induced cytokine storm using biomimetic cell wall-enveloped mesenchymal stem cells <u>Role: PI; with T. Sutton (Co-PI)</u> | \$60,000 |

❖ [Funding History](#)

07/2016 - present (full professor)

| | | |
|-----------------------------------|---|-------------|
| 06/2020-05/2024 NIH R01 | Aptamer-functionalized cardiac patches <u>Role: PI with C. Zhang (co-investigator)</u> | \$2,138,948 |
| 03/2020 Penn State | An enzyme-free, antibody-free and PCR-free DNA-based method for rapid, sensitive and ambient detection of SARS-CoV-2 <u>Role: PI</u> | \$55,000 |
| 04/2020 Penn State | Advanced human iPSC assay to model brain development for ASDs <u>Role: Co-PI; with Mao Y (PI) and Hicks S (Co-PI)</u> | \$25,000 |
| 04/2020 Penn State | Suppression of SARS-CoV-2 induced cytokine storm using biomimetic cell wall-enveloped mesenchymal stem cells <u>Role: PI; with T. Sutton (Co-PI)</u> | \$60,000 |

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| 09/2019-12/2023 NIH R01 Supplement | Semi-synthetic biomaterials for skin wound healing <u>Role: PI</u> | \$133,672 |
| 09/2019-08/2022 NSF | IIBR Instrumentation: Collaborative Research: Development of a single-biomolecule detection instrument via digital counting of nanoparticles <u>Role: PI (5100%)</u> | \$180,000 |
| 07/2019-06/2021 AHA | Programmable Drug-Releasing Surface for Anti- thrombosis <u>Role: Co-PI (50%); with K Manning (PI)</u> | \$200,000 |
| 01/2019-03/2019 IMERYS | Induced Blood Clotting using Particles <u>Role: PI</u> | \$ 36,153 |
| 05/2018-02/2023 NIH R01 | Semi-synthetic biomaterials for skin wound healing <u>Role: PI; with Xiong N (co-investigator)</u> | \$2,119,745 |
| 07/2018-06/2021 NSF | Growth of hybrid polymeric nanostructures for enzyme-free amplified protein imaging <u>Role: PI</u> | \$ 318,696 |
| 01/2017-12/2017 CoE | Signal Amplification for In Situ Protein Analysis <u>Role: PI</u> | \$ 75,000 |
| 08/2011 – 06/2016 (associate professor) | | |
| 08/2015-05/2020 NIH R01 | Molecularly regulated release of angiogenic factors from superporous hydrogels <u>Role: PI; with Fong GH (co-investigator)</u> | \$2,160,750 |
| 07/2015-06/2016 Grace Woodward | Hydrogel composites for segmental bone defect healing <u>Role: co-PI (50%); with H Donahue (co-PI);</u> | \$ 50,000 |
| 9/2012-08/2015 NSF | INSPIRE: Programming Materials via Biomolecular Engineering <u>Role: PI</u> | \$ 400,000 |
| 09/2012-08/2015 NSF | MRI: Acquisition of a State-of-the-Art Small Angle X-Ray Scattering (SAXS) Instrument for Research and Education. <u>Role: participant; PIs: M.P. Nieh; J. Cole and D. Adamson;</u> | \$ 568,398 |
| 01/2012-12/2014 NSF | Single-step manufacture of affinity nanodiscs for drug delivery. <u>Role: co-PI (33%); with M.P. Nieh (PI) and T.H. Fan (co-PI).</u> | \$ 387,249 |
| 09/2012-08/2013 UConn | Nanomaterials for cancer therapy. <u>Role: PI</u> | \$ 21,000 |
| 01/2012-12/2012 UConn | Hydrogels for the treatment of IVD <u>Role: co-PI (40%); with I. Moss (PI);</u> | \$ 100,000 |
| 11/2011-10/2014 ONR | Integration of Biological Specificity with Solid State Devices for Selective Chemical Sensing. <u>Role: co-PI (49%); with Brian Willis (PI)</u> | \$ 551,461 |

08/2006 – 07/2011 (assistant professor)

| | | |
|--|--|------------|
| 05/2010-04/2015 NSF | CAREER: Creation of Complex Biomimetic Materials via Molecular Recognition. <u>Role: PI;</u> | \$ 479,642 |
| 07/2010-06/2013 NSF | Controlling Protein Release via Intermolecular Hybridization <u>Role: PI; with T.H. Fan (co-PI)</u> | \$ 316,839 |
| 09/2010-08/2013 NSF | Reversible Cell Capture and Release for Cell Separation. <u>Role: PI</u> | \$ 291,110 |
| 09/2009-08/2012 NSF | Functionally Graded Orthopedic Implants via the Slurry Mixing and Dispensing Process. <u>Role: co-PI (30%); with L. Shaw (PI)</u> | \$ 330,000 |
| 07/2007-12/2010 NSF | Multivalent "Artificial Antibody" Based on RNA/Dendrimer-Like Star Polymer Hybrid Nanomaterials. <u>Role: PI; with L. Zhu (co-PI)</u> | \$ 450,000 |
| 07/2008-06/2013 NSF | Multiple REU supplemental grants <u>Role: PI</u> | \$ 30,000 |
| 06/2009-05/2012 Connecticut Public Health | Hybrid peptide/RNA molecules for safe and efficient gene silencing in human embryonic stem cells. <u>Role: PI</u> | \$ 200,000 |
| 08/2009-07/2012 U.S. Department of Education | GAANN: Biomaterials for Tissue Regeneration. <u>Role: participant; PIs: Dr. Mei Wei; Dr. Jon Goldberg;</u> | \$ 653,280 |
| 2010 UConn | In Vivo Imaging System. <u>Role: PI</u> | \$ 69,000 |
| 1/2007-12/2007 UConn | Development of Multivalent RNA Nanostructures on the Surface of Dendrimer, Office of Research and Graduate Education. <u>Role: PI</u> | \$ 27,000 |
| 8/2006-8/2008 UConn | <u>Startup package</u> including equipment, research supplies, summer salary and student support | \$ 240,000 |

PATENT APPLICATIONS

1. Wang, Y., Brandon Davis, Peng Shi. BIODEGRADABLE DNA-ALGINATE CONJUGATE FOR REVERSIBLE PROTEIN AND CELL LABELING AND IMAGING
2. Wang, Y., Brandon Davis, Peng Shi. An enzyme-free, antibody-free and PCR-free DNA-based method for rapid, sensitive and ambient detection of viral mRNA.

3. Wang, Y., Coyne, J., Kauffman, D., Davis, B. Therapeutic microneedles for heart and hair. PCR/US 2019/048242
4. Wang, Y., Peng Shi, Synthesis of biomimetic cell wall structure. US Provisional Patent application No. 62808358
5. Wang, Y., Xiaolong Zhang. Semi-synthetic tissue constructs for tissue regeneration. US Provisional Patent application No. 79618/36
6. Wang, Y., Erin Gaddes, Jinping Lai, Niancao Chen. Polymer-based signal amplification for protein and cell detection. Patent No. US 10,732,175
7. Wang, Y., Soontornworajit, B, Chen, N. Affinity hydrogel compositions for controlled protein release. PCT/US2011/022128
8. Yuan, F., Wang, Y., Li, C.Y. Methods and compositions for reducing systemic toxicity of viral vectors. PCT/US2006/005044; US 60/652,171

CONFERENCE PROCEEDINGS/ABSTRACTS

1. Juhl IV OJ, Zhao N, Wang Y, Donahue H. Aptamer functionalized fibrin hydrogel for angiogenesis and osteogenesis. BMES Annual Meeting. Phil, PA. Oct 16-19, 2019.
2. Davis B, Shi P, Wang Y. Reversible Signal Amplification for Protein Imaging via DNA hybridization. BMES Annual Meeting. Phil, PA. Oct 16-19, 2019.
3. Shi P, Zhao N, Lai J, Coyne J, Gaddes E., Wang Y. Nanomanufacturing of Supramolecular DNA Nanomaterials on Live Mammalian Cells. BMES Annual Meeting. Phil, PA. Oct 16-19, 2019.
4. Abune L, Zhao N, Lai J, Wang Y. Sustained release of VEGF and bFGF from dual aptamer-functionalized hydrogels for enhanced stimulation of angiogenesis. BMES Annual Meeting. Phil, PA. Oct 16-19, 2019.
5. Coyne J, Mridula M, Anuoluwapo O, Wang Y. Nanoparticle assembly for the development of aptamer-functionalized Injectable Hydrogels for protein Delivery and skin wound healing. BMES Annual Meeting. Phil, PA. Oct 16-19, 2019.
6. Peng Shi, Yong Wang. Supramolecular DNA assembly for surface functionalization of live cells. ACS Spring 2019 National Meeting. Orland, FL. March 31- April 4, 2019
7. Ann Ramirez, James Coyne, Yong Wang. Quantification of diffusion of gelatin nanoparticles from microneedles to tissues. 2018 BMES Annual Meeting. Georgia Oct.17-20, 2018
8. Yong Wang, Nan Zhao, Ming Xu, Na Xiong, Guo-Hua Fong, Li-Juan Duan. Promotion of skin wound healing using aptamer-functionalized fibrin hydrogels. 2018 BMES Annual Meeting. Georgia Oct.17-20, 2018
9. Wang Y, Lai J. Hydrogels for biomimetic signal transduction and cell regulation. BMES Annual Meeting. Phoenix, AZ. Oct 11-14, 2017.
10. Davis B., Kauffman D, Coyne J., Wang Y. Dissolvable Microneedles for Inhibition of Angiogenesis. BMES Annual Meeting. Phoenix, AZ. Oct 11-14, 2017.
11. Kauffman D, Davis, B., Coyne J., Wang Y. Sustained Release of Protein Drugs from Polymeric Microneedles for Immunotherapy. BMES Annual Meeting.

Phoenix, AZ. Oct 11-14, 2017.

12. Guevara M. Wang Y. Nanoparticle Self-Assembly for Colloidal Gel Fabrication. BMES Annual Meeting. Phoenix, AZ. Oct 11-14, 2017.
13. Zhao N, Xu M, Coyne, J, Wang Y. Self-assembly of aptamer-functionalized fibrinogen for sustained growth factor delivery and enhanced skin wound healing. The ACS Annual Meeting, Washington DC, Aug. 20-24, 2017.
14. Coyne J., Davis B, Wang Y. Reducing apparent diffusivity of aptamer-functionalized nanogels for controlled protein release. American Chemical Society's National Meeting, Washington, D.C., August 20-24, 2017
15. Akindele Davis, James Coyne, Yong Wang. Effect of AOT Concentration on Gelatin Nanoparticle Diameter. Biomedical Engineering Society Annual Meeting. Twin City, MN. October 5-8, 2016
16. Zhao N, Battig M, Xu M, Xiong N, Fong GH, Wang Y. Aptamer-functionalized hydrogels for skin wound healing. Society for Biomaterials. Minneapolis, Minnesota. April 5-8, 2017.
17. Zhao N, Zhang X, Duan L, Fong GH, Wang Y. Molecularly regulated release of growth factors from programmable hydrogels. Montreal, Canada. WBC 2016. May 18, 2016.
18. Jiang PL, Zhou Z, Zhang X, Donahue H, Wang Y. Porous extracellular matrix mimic for functionalization of bone allografts. ORS 2016 Annual Meeting. Orlando, Florida, March 5-8, 2016.
19. Gaddes ER, Gydush G, and Wang Y. Aptamer-mediated capture and release of circulating tumor cells in dynamic conditions. The SFB Annual Meeting Charlotte, NC. April 15-18, 2015.
20. Li S. and Wang Y. A sustainable material for capturing and killing circulating tumor cells. The SFB Annual Meeting Charlotte, NC. April 15-18, 2015.
21. Wang Y. Aptamer-functionalized non-fouling hydrogels for regulating cell-material interactions. The Tissue Response to Implanted Active Medical Devices Meeting. Herndon, Virginia. May9-10, 2014.
22. Wang Y. Programmable hydrogels for drug delivery and regenerative medicine. The SFB Annual Meeting Denver, CO. April 16-19, 2014.
23. Paglia DN, Battig MR, Drissi H., Wang Y. Moss IL. rhPDGF-BB release from aptamer-functionalized superporous PEG hydrogels: a scaffold for matrix formation and potential disc repair. ORS 2014 Annual Meeting. New Orleans, Louisiana, March 15-18, 2014.
24. Stellon M., Li, S., Wang, Y. Aptamer-functionalized hydrogel-based fluidic system for dynamic cell-type-specific capture and release. The BMES Annual Meeting. Sep. 25-28, 2013.
25. Swaminathan, V.V., Gannavaram, S., Li, S., Hu, H., Yeom J., Wang, Y., Zhu, L. Microfluidic platform with hierarchical micro/nanostructures and SELEX nucleic acid aptamer coating for isolation of circulating tumor cells. The 13th IEEE International Conference on Nanotechnology. Aug. 5-8, 2013.
26. Battig, M., Chen, N., Wang, Y. Superporous extracellular matrix mimics for on-demand release of growth factors based on nucleic acid aptamers and

- superporous hydrogels. The SFB Annual Meeting. April 10-13, 2013.
27. Li, S., Chen, N., Zhang, Z., Wang, Y. Aptamer functionalized hydrogel coating for cell capture and release. The BMES Annual Conference. Oct. 24-27, 2012. Atlanta, GA.
 28. Boch, K.N., Battig, M.R., Wang, Y. Electro-responsive affinity hydrogels for controlled protein release. The BMES Annual Conference. Oct. 24-27, 2012. Atlanta, GA.
 29. Wang, Y., Soontornworajit, B., Battig, M.R., Chen, N. Development of artificial extracellular matrix for sequential triggered release of multiple growth factors using aptamer and hydrogel. The 9th World Biomaterials Congress. June 1-5, 2012, Chengdu, China
 30. Chen, N., Wang, Y. Development of artificial extracellular matrix for cell adhesion using aptamer and hydrogel. The 9th World Biomaterials Congress. June 1-5, 2012, Chengdu, China
 31. Wang, Y., Battig, M.R., Soontornworajit, B., Chen, N. Aptamer-functionalized hydrogels for mimicking extracellular matrices. Fifth Annual Advances in Biomolecular Engineering, The New York Academy of Sciences.4/27/2012. New York, NY.
 32. Battig, M.R., Soontornworajit, B., Wang, Y., Affinity Hydrogel for Controlled Protein Release: Tuning the Binding Capability of Aptamers, The BMES Annual Conference. Oct. 12-15, 2011. Hartford, CT.
 33. Chen, N., Wang, Y., Hydrogel Functionalization with Nucleic Acid Aptamers for Cell Adhesion. The BMES Annual Conference. Oct. 12-15, 2011. Hartford, CT.
 34. Zhang, Z., Chen, N., Li, L., Wang, Y. aptamer-functionalized surface for cell separation. The BMES Annual Conference. Oct. 12-15, 2011. Hartford, CT.
 35. Wang, Y., Soontornworajit, B., Chen, N. Synthesis of Tissue-Like Nanostructured Biomaterials for Tissue Regeneration, The Gordon Research Conference. June 5-10, 2011. Colby-Sawyer College in New London NH.
 36. Fan, T.H., Soontornworajit, B., Karzar-Jeddi, M., Wang, Y. Modeling of Sustained Protein Release from Aptamer-Modified Hydrogels, The 1st International Symposium on Colloids and Materials. May 8-11, 2011, Amsterdam, The Netherlands.
 37. Soontornworajit, B., Zhou, J., Battig, M., Wang, Y. Affinity Hydrogels for Controlling Protein Release via Intermolecular Hybridization. The 2011 Annual Meeting of the Society for Biomaterials, April 13-16, 2011, Orlando, FL.
 38. Cao, W., Zhou, J., Soontornworajit, B., Wang, Y., Zhu, L. Synthesis of folate functionalized biodegradable amphiphilic dendrimer-like star polymer for targeted cancer cells. *The 2010 AIChE Annual Meeting*, Nov. 7-12, 2010, Salt Lake City, UT
 39. Soontornworajit, B., Zhou, J., Wang, Y. Pulsatile growth factor release from novel aptamer-functionalized composites. *The 2010 AIChE Annual Meeting*, Nov. 7-12, 2010, Salt Lake City, UT
 40. Soontornworajit, B., Zhou, J., Wang, Y. Aptamer-decorated hydrogels for sustained protein release. *The 2010 AIChE Annual Meeting*, Nov. 7-12, 2010,

Salt Lake City, UT

41. Zhou, J., Soontornworajit, B., Wang, Y. A novel artificial antibody for reversible cell recognition. *The 2010 AIChE Annual Meeting*, Nov. 7-12, 2010, Salt Lake City, UT
42. Soontornworajit, B., Zhou, J., Wang, Y. Aptamer-functionalized biomaterials for pulsatile proteins release. *The 2010 Biomedical Engineering Society Annual Fall Meeting*, Oct. 6-9, 2010, Austin, TX.
43. Soontornworajit, B., Zhou, J., Wang, Y. Sustained protein release from novel aptamer-functionalized hydrogels. *The 2010 Biomedical Engineering Society Annual Fall Meeting*, Oct. 6-9, 2010, Austin, TX.
44. Soontornworajit, B., Karzar-Jeddi, M., Wang, Y., Fan, T.H. Modeling of sustained protein release from an aptamer-functionalized hydrogel. *The 2010 Biomedical Engineering Society Annual Fall Meeting*, Oct. 6-9, 2010, Austin, TX.
45. Zhou, J., Soontornworajit, B., Wang, Y. A temperature-responsive synthetic antibody for reversible cell labeling. *The 2010 Biomedical Engineering Society Annual Fall Meeting*, Oct. 6-9, 2010, Austin, TX.
46. Soontornworajit, B., Zhou, J., Wang, Y. Controlled protein release from aptamer-decorated hydrogels. *The 240th ACS National Meeting & Exposition*, Aug. 22-26, 2010, Boston, MA.
47. Zhou, J., Soontornworajit, B., Wang, Y. Antibody-like nanomaterials for cell recognition. *The 240th ACS National Meeting & Exposition*, Aug. 22-26, 2010, Boston, MA.
48. Wang, Y. Material aptamerization for drug delivery. GRC Conference on Drug Carriers in Medicine & Biology. Aug. 15th -20th, 2010, Waterville Valley, NH.
49. Zhou, J., Soontornworajit, B., Wang, Y. Determining the essential nucleotides of an aptamer by using molecular guides. *The 2009 Biomedical Engineering Society Annual Fall Meeting*, Oct. 7-10, 2009, Pittsburgh, PA Abstract No. 282
50. Zhou, J., Soontornworajit, B., Wang, Y. Artificial antibody for cancer cell labeling. *The 2009 Biomedical Engineering Society Annual Fall Meeting*, Oct. 7-10, 2009, Pittsburgh, PA Abstract No. 283
51. Zhou, J., Soontornworajit, B., Wang, Y. Using molecular guides to identify the essential nanostructures of nucleic acid aptamers. *The 238th ACS National Meeting & Exposition*, Aug. 16-20, 2009, Washington, DC Abstract No. BIOT 112
52. Zhou, J., Soontornworajit, B., Wang, Y. A DNA aptamer-based nanomaterial for targeted cell labeling. *The 238th ACS National Meeting & Exposition*, Aug. 16-20, 2009, Washington, DC Abstract No. PMSE 255
53. Zhou, J., Soontornworajit, B., Wang, Y. Using nucleic acid aptamers to develop artificial antibodies for drug delivery. *The 2009 Annual Meeting of the Society For Biomaterials*, April 22-25, 2009, San Antonio, TX Abstract No.115.
54. Yuan, F., Wang, Y. Systemic dissemination of viral vectors during and after intratumoral infusion. *Annual BMES Meeting*, Sep. 28-Oct. 1, 2005. Baltimore, MD. Abstract No. 142109.
55. Wang, Y., Li, C.Y., Yuan, F. Adenovirus dissemination in convection-enhanced

- delivery and its control with a polymeric vehicle. *The 226th ACS National Meeting*, Sep.7-11, 2003. New York, NY. Abstract No. 668381.
56. Yuan, F., Wang, Y. Controlled release of ethacrynic acid from PLGA films for glaucoma treatment. *2002 AIChE Annual Meeting*. Nov.3-8, 2002. Indianapolis, IN. Abstract No. 307a.
 57. Wang, Y., Li, C.-Y., Yuan, F. Systemic virus dissemination during local gene delivery in solid tumors and its control with an alginate solution. *Proceedings of the 26th Annual International Conference of the IEEE EMBS*, San Francisco, CA. 2004; 26: 3524-3526.
 58. Wang, Y., Hu, J.K., Krol, A., Li, Y.-P., Li, C.-Y., Yuan, F. Reducing systemic toxicity in local tumor gene therapy using an alginate solution. *Proceedings of the Second Joint EMBS/BMES Conference*, Huston, TX. 2002; 1: 565
 59. Lin, C.W., Wang, Y., Yuan, F. Transscleral diffusion of ethacrynic acid and sodium fluorescein. *Proceedings of the Second Joint EMBS/BMES Conference*. Huston, TX. 2002; 1: 515
 60. Wang, Y., Xie, Y.B., Li, J., Chi, C., Han, B., Ma, X.J. Study on preparing the alginate/chitosan microcapsule. *Proceedings of the Eighth National Conference on Biochemical Engineering*, Nanjing, China. 1998; 402-405.

INVITED PRESENTATIONS

1. Nucleic acid engineering for biomimetic materials. Department of Biomedical Engineering, Missouri University of Science and Technology, Aug.24, 2021
2. Nucleic acid engineering for biomimetic materials. Department of Biomedical Engineering, Tufts University, Sep. 14th, 2020
3. Biomimetic extracellular matrix for protein delivery and regenerative medicine. National Institute of Materials Science, Tsukuba, Japan Nov. 27th, 2019
4. Self-assembly of biomolecules for synthesis of biomimetic cell walls on live mammalian cells. The 41th Annual meeting of Society for Biomaterials, Tsukuba, Japan Nov. 25th, 2019
5. Nucleic acid engineering for biomimetic materials. Department of Bioengineering, The University of Tokyo, Japan Nov. 21th, 2019
6. Nucleic acid engineering for biomimetic materials. Department of Advanced Transdisciplinary Sciences, Hokkaido University, Japan Nov. 18th, 2019
7. Nucleic acid engineering for biomimetic materials. FIBERS, Konan University, Japan Nov. 11th, 2019
8. Nucleic acid engineering for biomimetic materials. School of Engineering, Osaka Prefecture University, Osaka, Japan Oct.23, 2019
9. Biomimetic niche for stem cell delivery using aptamer functionalized hydrogel. The 2nd Macau Stem Cell Symposium, Sep.27th, 2019
10. Biomimetic materials for regenerative medicine and cell delivery. The 4th CASNN Conference, Hanzhou, Aug. 20th, 2019
11. Biomimetic materials for regenerative medicine and cell delivery. Tianjin University, August 7th, 2019

12. Biomimetic materials for regenerative medicine and cell delivery. Beijing University, August 5th, 2019
13. Biomimetic materials for regenerative medicine and cell delivery. The Lecture (22) for the 70th Anniversary of the Founding of DICP, Dalian Institute of Chemical Physics at the Chinese Academy of Sciences, July 22nd, 2019
14. Programmable hydrogels for protein delivery. Virginia Commonwealth University, Feb.21, 2018.
15. Programmable biomaterials for protein delivery. Xi'an Jiaotong University, China, July 10th, 2017.
16. Programmable biomaterials for protein delivery. Lehigh University, PA, May 3rd, 2017.
17. Bioinspired ECM-like hydrogels for controlled growth factor Release. ACS National Meeting & Exposition, Philadelphia, PA, Aug 22, 2016
18. Programmable biomaterials for protein delivery. Dalian Institute of Chemical Physics, the Chinese Academy of Sciences, Dalian, China. July 19, 2016
19. Programmable biomaterials for protein delivery. Dalian University of Technology, Dalian, China. July 18, 2016
20. Programmable materials for protein delivery. Suzhou University, Suzhou, China. July 13, 2016
21. Nanoparticle-functionalized hydrogels for sustained protein drug release. Precision Nanomedicine Symposium. Beijing, China. July 8-11, 2016
22. Regulation of self-healing hydrogels for sequential cell attachment and detachment. Fifth International Conference on Self-Healing Materials. Durham, NC. June 22-24, 2015.
23. Programmable hydrogels for protein delivery and regenerative medicine. Department of Materials Science and Engineering, Ohio State University, April 24, 2015.
24. Programmable hydrogels for protein delivery and regenerative medicine (*keynote speech*). The 41st Annual Northeast Bioengineering Conference. Troy, NY. April 17-19, 2015.
25. Programmable hydrogels for drug delivery and regenerative medicine. University of Akron. Akron OH. Oct. 31, 2014
26. Programmable hydrogels for drug delivery and regenerative medicine. University of Wisconsin - Madison. April 8th, 2014. (Big Ten Talk)
27. Programmable hydrogels for drug delivery and regenerative medicine. The 7th World Congress of Biomechanics. Boston, MA. July 6-11, 2014
28. Programmable extracellular matrix mimics for protein drug delivery via nucleic acid hybridization. The 5th Sino-American Workshop on Biomedical Engineering and China-Oversea Joint Workshop on Biomechanics. Aug. 1-5, 2013.
29. Programmable materials for on-demand drug delivery. Department of Pathobiology and Veterinary Science, University of Connecticut. Feb. 14, 2013.

30. Programmable molecular recognition for biomaterials engineering. Department of Bioengineering, The Pennsylvania State University. March 27th, 2012.
31. Development of artificial extracellular matrix using aptamers and hydrogels. Department of Chemistry, the University of Rhode Island, Sep. 26, 2011.
32. Development of artificial extracellular matrix using aptamers and hydrogels. The ACS Meeting at Denver, Aug.31, 2011.
33. Affinity hydrogels for controlling protein release at will. The 5th Annual Research Day, UConn Health Center. June 10, 2011.
34. Creation of artificial extracellular matrix using aptamers and hydrogels. The DFG-NSF Research Conference, March 22-25, 2011, New York City, NY.
35. Creation of Biomimetic Materials with Nucleic Acids as Fundamental Structural Components. *BIT' s 3rd World Congress of Industrial Biotechnology 2010*. July 25th, 2010
36. Aptamer-Functionalized Materials for Cell Detection and Drug Delivery. *Gordon Research Conference on Bioanalytical Sensors*. June 23rd, 2010
37. An Antibody-Like Nanomaterial for Specific Recognition of Cancer Cells. *UConn Breast Cancer Program*. May 7th, 2010
38. Nucleic Acid-Based Nanomaterials for Recognition of Target Cells. *Department of Biomedical Engineering, Tufts University*. April 13th, 2009
39. Artificial Antibodies for Biomedical Applications. *Department of Animal Science, University of Connecticut*. Oct. 23rd, 2009
40. Nucleic Acid-Based Nanomaterials for Recognition of Target Cells. *Polymer Program, IMS, University of Connecticut*. April 17th, 2009
41. Engineering Nanomedicines: Virus or Smaller Viral Component? *State University of New York at Albany*. Nov 30 2007
42. Nanomedicines Engineering & Delivery: From Viruses To RNA Construct. *Department of Chemical and Biomolecular Engineering. University of Connecticut*. March 10th, 2006.
43. Nanomedicines Engineering & Delivery: From Viruses To RNA Construct. *Department of Pharmacy. University of Maryland at Baltimore* April 6th, 2006,
44. Nanomedicines Engineering & Delivery: From Viruses To RNA Construct. *Department of Bioengineering. University of Maryland College Park*. April 7th, 2006

TEACHING & ADVISING EXPERIENCES

- **ACADEMIC OFFERINGS AT PENN STATE**

| <u>Semester & Year</u> | <u>Course No. & Title</u> | <u>Solo (Y/N)</u> | <u>Enrollment</u> |
|----------------------------|--|-------------------|-------------------|
| Fall 2021 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 19 |

| | | | |
|-------------|---|---|----|
| Spring 2021 | Drug Delivery (BME 433) | Y | 18 |
| Fall 2020 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 16 |
| Spring 2020 | Drug Delivery (BME 433) | Y | 20 |
| Spring 2020 | BME 100S Biomedical Engineering Seminar | Y | 32 |
| Spring 2020 | Drug Delivery (BME 433) | Y | 40 |
| Spring 2019 | Drug Delivery (BME 433) | Y | 20 |
| Fall 2018 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 13 |
| Spring 2018 | Drug Delivery (BME 433) | Y | 15 |
| Fall2017 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 5 |
| Spring 2017 | Drug Delivery (BME 433) | Y | 22 |
| Fall2016 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 18 |
| Fall 2016 | Bioengineering Thermodynamics (BME 313) | N | 95 |
| Spring 2016 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 17 |
| Fall 2015 | Drug Delivery (BME 433) | Y | 16 |
| Spring 2015 | Bioengineering Transport Phenomena (BME/CHE 501) | Y | 12 |
| Fall 2014 | Thermodynamics for Biomedical Engineering (BME 313) | Y | 67 |
| Spring 2014 | Drug Delivery (BME 495) | Y | 7 |
| Fall 2013 | Thermodynamics for Biomedical Engineering (BME 313) | Y | 67 |
| Spring 2013 | Drug Delivery (BME 495) | Y | 17 |

- **ACADEMIC OFFERINGS AT UCONN**

| | | | |
|-------------|--|---|----|
| Fall 2012 | Transfer Operations 1 (CHEG 5315) | Y | 21 |
| Spring 2012 | Nanobiotechnology & Nanobiomaterials (CHEG 4995/5395) | Y | 27 |
| Fall 2011 | Chemical Engineering Lab (CHEG 4137) (Grading lab reports) | N | 50 |
| Spring 2011 | Drug Delivery CHEG4995/5395 & BME 4985/6086 | Y | 27 |
| Fall 2010 | Transfer Operations-1 CHEG 3123 (with honor session) | Y | 59 |
| Spring 2010 | Drug Delivery CHEG4995/5395 & BME 4985/6086 | Y | 28 |
| Fall 2009 | Transfer Operations-1 CHEG 3123 (with honor session) | Y | 60 |
| Spring 2009 | Drug Delivery CHEG4995/5395 & BME 4985/6086 | Y | 27 |
| Fall 2008 | Transfer Operations-1 CHEG 3123 (with honor session) | Y | 31 |
| Spring 2008 | Drug Delivery CHEG 320/295 & BME 300 | Y | 22 |
| Fall 2007 | Transfer Operations-1 CHEG 223 (with honor session) | Y | 51 |
| Spring 2007 | Drug Delivery CHEG 320/295 & BME 300 | Y | 18 |

• **CURRENTLY ADVISED PH.D. STUDENTS * & Postdoctoral Research Associate**

- 08/2020 – Connie Wen
Project: aptamer-functionalized cardiac patches
- 08/2020 – Kyungsene (Keith) Lee
Project: DNA-directed functionalization of immune cells
- 08/2019 – Xuelin Wang
Project: Polyvalent antibody mimics for the surface engineering of natural killer cells
- 08/2018 – Brandon Davis *
Dissertation project: Functional nanomaterials for cell imaging and delivery
- 08/2016 – Lidya Abune *
Dissertation project: Multifunctional aptamer-functionalized hydrogels for protein delivery

• **Graduated Ph.D. Students * (9) and M.S. Student (5) since 2006**

| | |
|-------------------|--|
| 08/2016 – 05/2021 | James Coyne * (at PSU) Dissertation project: Development and evaluation of hydrogels for growth factor and cell delivery |
| 08/2015 – 08/2019 | Nan Zhao * (at PSU) Dissertation project: Semi-synthetic dressing for skin wound healing |
| 11/2014 – 12/2016 | Pinliang Jiang (visiting PhD student) Dissertation project: Hybrid composites for drug delivery |
| 08/2013 – 08/2016 | Erin Richards * (at PSU) Dissertation project: Programmable DNA polymers for single-cell catch, release and detection |
| 08/2011 – 01/2016 | Dr. Shihui Li * (at PSU) Dissertation project: Programmable hydrogels for catching and killing cancer cells |
| 08/2011 – 09/2015 | Dr. Xiaolong Zhang * (at PSU) Dissertation project: Decellularized tissue for regenerative medicine |
| 08/2009 – 10/2014 | Dr. Mark Battig * (at PSU) Dissertation project: Programmable hydrogels for on-demand release of multiple protein drugs |
| 08/2010 – 12/2014 | Dr. Niancao Chen * (at PSU) Dissertation project: Programmable DNA nanomaterials for drug sequestration, detoxification and delivery |
| 08/2006 – 05/2011 | Dr. Boonchoy Soontornworajit * (at UConn) Dissertation project: Aptamer-functionalized hydrogels for controlled protein release |
| 01/2007 – 12/2010 | Dr. Jing Zhou * (at UConn) Dissertation project: Synthetic antibodies for cell recognition |
| 08/2018 – 08/2019 | Stefanie Blanco (at PSU) Research project: Nanoparticles for blood coagulation |
| 08/2017 – 08/2018 | Anuoluwapo Olubode (at PSU) Research project: Synthesis of gelatin nanoparticles |
| 08/2012 – 08/2015 | Yike Huang (at PSU) Research project: Programmable drug delivery |
| 08/2014 – 08/2016 | Xuechen Shi (at PSU) |

Research project: Programmable drug delivery

01/2010 – 05/2011

Alexander Mann (at UConn)

Research project: Dendrimer-like nanomaterials

• **Supervised Postdocs (4) & Visiting Scholars (4) &**

09/2018 – 08/2020

Dr. Huizhen Jia

Cell surface engineering for cancer immunotherapy

04/2016 – 08/2020

Dr. Peng Shi

Biomimetic cell wall for cell therapy

03/2015 – 06/2018

Dr. Jinping Lai

Programmable biomaterials

01/2015 – 07/2015

Dr. Mark Battig

Programmable hydrogels for controlled protein release

03/2010 – 01/2012

Dr. Zhaoyang Zhang

Programmable hydrogel surface for reversible cell catch and release

08/2012 – 12/2012

Dr. Yanxia Xing[&]

Aptamer-functionalized hydrogel surface

08/2012 – 07/2013

Dr. Huanyu Liu[&]

Functional nanomaterials

11/2013 – 12/2014

Dr. Hong Zheng[&]

Smart hydrogels for biosensing

09/2014 – 08/2015

Dr. Xilan Ma[&]

Self-healing hydrogels

• **MENTORED UNDERGRADUATE RESEARCHERS**

2006: Jacob Martin (honor student)

2006: Dagan Alon

2008: Emily Tao (REU & honor student)

2008: Andrea Ryan

2009: Matthew Snipes (REU student)

2009: Daniel Zachs

2009: Brian Schwab (honor student)

2009: Rachel Lellis

2009: Alexander Mann

2010: Congtin Phan

2010: Eleni Kursten

2010: Alyssa Smith

2010: Nha Duong

2011: Kelsey Boch

2012: Cheng Yang

2012: Derek Hargrove

2012: Matt Turiano

2013: Michael Stellon

2014: Greg Gydush

2013: Kyle Plasterer

2014: Andrew Simonson

2014: Katelyn Duncan

2014: Alex Chan

2014: James Coyne

2016: Justin Dinenberg

2017: Brandon Davis

2017: David Kauffman

2018: Mridula Menon

2017: Akiho Suzuki

2019: Allison Brown

2019: Merryl Augustine

2019: Emily Schwartz

ACADEMIC & PROFESSIONAL SERVICE

© EDITORSHIP

| | | |
|------------|------------------|---|
| 2021-2019- | Associate Editor | Research (Science Partner Journal) |
| 2019-2020 | Editorial Board | Smart Materials in Medicine |
| 2017-2020 | Guest Editor | ACS Biomaterials Science & Engineering |
| 2017-2020 | Editorial Board | ACS Biomaterials Science & Engineering |
| 2009-2013 | Editorial Board | Scientific Reports |
| 2007-2009 | Section Editor | Handbook of Biomedical Engineering, 4 th Edition |
| | Guest Editor | IEEE Engineering in Medicine and Biology Magazine |

◎ **CHAIR/CO-CHAIR/ORGANIZING COMMITTEE OF PROFESSIONAL CONFERENCE**

| | | |
|------|---|--|
| 2020 | Co-chair, 2020 Northeastern Bioengineering Conference. | |
| 2015 | International Conference and Expo on Biomechanics and Implant Design, July 27-29, 2015 Florida, USA | |
| 2013 | STEERING COMMITTEE, 3 rd International Conference on Management, Manufacturing and Materials Engineering, Oct. 25-27, 2013, Xi'an, China | |
| 2012 | International Conference on Tissue Science and Engineering, Oct. 1 st -3 rd , 2012, Chicago, USA | |

◎ **SESSION CHAIR/CO-CHAIR OF PROFESSIONAL CONFERENCE**

| | |
|--------------------------------|---|
| Nov. 25 th , 2019, | The 41th Annual meeting of Society for Biomaterials in Japan |
| April 16 th , 2015, | Society for Biomaterials Annual Conference |
| April 17 th , 2014, | Society for Biomaterials Annual Conference |
| July 25 th , 2010, | BIT' s 3 rd World Congress of Industrial Biotechnology |
| April 23 rd 2009, | Society for Biomaterials Annual Conference |
| Oct. 9 th , 2009, | BMES Annual Conference |

◎ **CURRENT PROFESSIONAL MEMBERSHIP**

Founding Member of CAFB
Member of BMES
Member of SFB
Member of ACS

◎ **REVIEW FOR CONFERENCE ABSTRACTS**

| | |
|-------|--|
| 2013, | Biomedical Engineering Society Annual Conference |
| 2009, | Society for Biomaterials Annual Conference |
| 2009, | Biomedical Engineering Society Annual Conference |

◎ **REVIEW FOR GRANT PROPOSALS**

| | |
|-------|---|
| 2008, | National Science Foundation (1 time) |
| 2009, | North Carolina Biotechnology Center |
| 2010, | Louisiana Board of Regents' Research |
| 2010, | U.S. Department of Agriculture |
| 2010, | American Chemical Society – PRF |
| 2011, | National Science Foundation (3 times) |
| 2011, | American Chemical Society – PRF |
| 2011, | Cariplo Foundation, Italy |
| 2012, | National Science Foundation (3 times) |
| 2012, | Cariplo Foundation, Italy |
| 2013, | National Science Foundation (3 times) |
| 2014, | American Heart Association |
| 2014 | Marion Milligan Mason Award for the Chemical Sciences Program |

2015, American Heart Association
2016 Marion Milligan Mason Award for the Chemical Sciences Program
2016, National Science Foundation
2016, National Institute of Health-NIBIB
2017, National Science Foundation
2017, Cariplo Foundation, Italy
2018, Marion Milligan Mason Award for the Chemical Sciences Program
2020, Panelist NIH Study Section BMBI
2021, CDMRP
2021 Chair NIH Study Section ZRG1 BST-M (50)
2021 Panelist NIH Study Section BMBI

REVIEW FOR PROFESSIONAL JOURNALS SINCE 2006

Advanced Drug Delivery Reviews
Biomacromolecules
Cancer Research
Gene Therapy
British Journal of Cancer
Molecular Pharmaceutics
International Journal of Pharmaceutics
Macromolecular Chemistry and Physics
Expert Opinion on Drug Delivery
Journal of Nanoengineering and Nanomanufacturing
Current Pharmaceutical Biotechnology
Nanoscale
Nucleic Acids Therapeutics
Journal of the American Chemical Society
Advanced Healthcare Materials
Journal of Biomedical Materials Research
Applied Microbiology and Biotechnology
Bioorganic and Medicinal Chemistry
Journal of Membrane Science
Biotechnology Progress
Biotechnology Advances
AAPS PharmSciTech
Tissue Engineering
Analyst
Biomaterials
RSC Advances
Soft Matter
Trends in Biotechnology
Science Advances
Langmuir
Experimental Cell Research
Angewandte Chemie International Edition
Advanced Functional Materials
Nature Communications
Advanced Materials
Chemical Science

Biomaterials science
ACS Biomaterials Science & Engineering

◎ **SERVICE AT THE DEPARTMENTAL LEVEL**

2020-2021 co-Chair of BME Faculty Search Committee
2015 – 2020 BME Faculty Search Committee
Spring 2015 /2017 Coordinator, BIOE 590 BME Department Seminars
2015 - Chair, BME Graduate Admission Committee
2014 - BME Graduate Admission Committee
2013 - Course/Comprehensive Exam/Candidacy Exam Committee for
Brittany Banik
Chuying Ma
Yixue Su
Dingying Shan
You Jung Kang
Yiqiu Xia
Wenlong Zhang
James Coyne
Lidya Abune
Janna Sloand
Yiming Liu
Andrew Simonson
Sailahari Ponnaluri
Zilu Liu
Chuying Ma
Ethan Gerhard
Micha Davila
Spring 2011 Coordinator, Connecticut Invention Convention
2010 ~ 2011 Coordinator, Open house
2010 ~ 2012 Chemical Engineering Safety Committee
2009 ~ 2012 Freshman Registration
2007 ~ 2008 CHEG Faculty Search Committee
2007 ~ 2009 Faculty volunteer, Open house
2007 ~ 2012 Biomedical Engineering Graduate Committee
2007 ~ 2012 CHEG PhD Qualifying Exam Committee
2007 ~ 2011 Dissertation/Thesis Committee for
Xiaohua Yu
Peggy Piteo
Paiyz Mikael
Rachelle Howard
Jianjun Miao
Yousef Sharifi
Rishi Jain
Andrea Knorr
2006 ~ 2012 CHEG Graduate Committee at UConn

◎ **SERVICE AT THE COLLEGE/UNIVERSITY LEVELS**

2021 Selection committee for Penn State Engineering Alumni Society Award
2015 ~2017 College of Engineering Sabbatical Leave Application Review Committee
2015 Co-organizer, Biomaterials Innovation Group for University Park and

| | |
|-------------|--|
| | Hershey Medical School |
| Spring 2015 | Review for the College of Engineering REU program |
| Spring 2015 | Judge for the College of Engineering Research Symposium |
| Spring 2014 | Judge for 17 th Annual Environmental Chemistry & Microbiology Student Symposium |
| Spring 2014 | Review for the College of Engineering REU program |
| Summer 2010 | School of Engineering NSF CAREER Proposal Review Panel |
| 2007 ~ 2012 | ENGR 100 Orientation to Engineering |

© **OUTREACH ACTIVITIES**

| | |
|-------------|---|
| summer 2017 | the Penn State CREATE program |
| summer 2016 | the Penn State CREATE program |
| summer 2012 | the UConn Mentor Connection |
| summer 2011 | the UConn Mentor Connection |
| summer 2010 | the UConn Mentor Connection |
| | E2K program |
| summer 2010 | the UConn Mentor Connection |
| summer 2009 | the UConn Mentor Connection |
| | E2K program |
| | the da Vinci Project |
| summer 2008 | the da Vinci Project, School of Engineering |
| summer 2007 | the UConn Mentor Connection |