

Yan Yu, Ph.D.

Associate Professor
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EDUCATION

2009 Ph.D. Materials Science and Engineering, University of Illinois at Urbana-Champaign
2004 B.S. Chemistry, Peking University, Beijing, China

EXPERIENCE

2019-present Associate Professor, Department of Chemistry, Indiana University-Bloomington
***Promotion to Full Professor received unanimous departmental vote in Sep 2022*
2012-2019 Assistant Professor, Department of Chemistry, Indiana University-Bloomington
***Maternity leaves in 2014 and 2017*
2009-2012 Postdoctoral Fellow, University of California, Berkeley
Advisor: Jay T. Groves
2004-2009 Research Assistant, University of Illinois at Urbana-Champaign
Advisor: Steve Granick
2000-2004 Undergraduate Research Assistant, Peking University, P. R. China
Advisor: Xinhua Wan

HONORS AND AWARDS

2021 Scialog Collaborative Innovation Award, Research Corporation for Science Advancement (RCSA)
2021 Scialog Fellow, Research Corporation for Science Advancement (RCSA)
2020 Japan Society for the Promotion of Science (JSPS) Invitational Fellowship
2019 Individual Research Award, Institute for Advanced Study, Indiana University
2017 Maximizing Investigators' Research Award (MIRA), National Institutes of Health (NIH)
2017 Trustees Teaching Award, Indiana University
2017 Sloan Research Fellow, Alfred P. Sloan Foundation
2016 Cottrell Scholar, Research Corporation for Science Advancement (RCSA)
2016 CAREER Award, National Science Foundation (NSF)
2013-7 Provost Travel Award for Women in Science, Indiana University

PUBLICATIONS

Since 2012: (*indicates corresponding author; † indicates undergraduate coauthors)

50. Ding, C.; et al. Yu, Y.; Yan, J.* Harnessing the Pre-metastatic Niche Macrophages through the Induction of Trained Immunity to Control Metastasis via the Sphingosine Lipid-Mitochondrial Fission Pathway. *Nature Immunology*, 2022, in press.
49. Wiemann, J. T.; Nguyen, D.; Li, Y.; Yu, Y.* Domain-selective disruption and compression of phase-separated lipid vesicles by amphiphilic Janus nanoparticles. *iScience*, 2022, *epub ahead of press*, DOI: 10.1016/j.isci.2022.105525

48. Laune, M. A.;[†] Zahidi, S. A.;[†] Wiemann, J. T.; Yu, Y.* Distinct antibacterial activities of nanosized cationic liposomes against gram-negative bacteria correlate with their heterogeneous fusion interactions. **ACS Applied Nano Materials**, 2022, 5, 10, 15201-10. DOI: 10.1021/acsnm.2c03332
† Undergraduate researchers
47. Yu, Y.-q.; Zhang, Z.; Walpole, G. W.; Yu, Y.* Kinetics of phagosome maturation is coupled to their intracellular motility. **Communications Biology**, 2022, 5, 1014. DOI: 10.1101/2021.04.04.438376
46. Li, M.; Vultorius, C.;[†] Bethi, Manisha;[†] Yu, Y.* Spatial organization of Dectin-1 and TLR2 during synergistic crosstalk revealed by super-resolution imaging, **Journal of Physical Chemistry B**, 126, 31, 5781-92. DOI: 10.1101/2022.04.25.489448
† Undergraduate researchers
45. Li, M.; Lee, S.; Zahedian, M.; Ding, C.; Yan, J.; Yu, Y.* Immobile ligands enhance FcγR-TLR2/1 crosstalk by promoting interface overlap of receptor clusters, **Biophysical Journal** 2022, 121, 966-976. DOI: 10.1016/j.bpj.2022.02.010
44. Xie, Q.; Wiemann, J.; Yu, Y.; Xu, X. G.* Dual-color Peak Force Infrared Microscopy, **Analytical Chemistry** 2022, 94, 2, 1425–1431. DOI:10.1021/acs.analchem.1c04756
43. Yu, Y.-q.; Jiao, M.; Zhang, Z.; Yu, Y.* Single-phagosome imaging reveals that homotypic fusion impairs phagosome degradative function, **Biophysical Journal** 2022, 121, 459-69. DOI: 10.1016/j.bpj.2021.12.032
42. Jiao, M.; Li, W.; Yu, Y.; Yu, Y.* Anisotropic Presentation of Ligands on Cargos Modulates Degradative Function of Phagosomes. **Biophysical Reports** 2022, 2, 100041. DOI: 10.1016/j.bpr.2021.100041
41. Lee, S.; Zhang, Z.; Yu, Y.* Real-time Simultaneous Imaging of Acidification and Proteolysis in Single Phagosomes Using Bifunctional Janus Particle Probes, **Angewandte Chemie** 2021, 60, 2-8. DOI: 10.1002/anie.202111094
40. Li, W.; Li, M.; Anthony, S. M.; Yu, Y.* Spatial Organization of FcγR and TLR2/1 on Phagosome Membranes Differentially Regulates Their Synergistic and Inhibitory Receptor Crosstalk. **Scientific Reports** 2021, 11, 13430. DOI: 10.1038/s41598-021-92910-9
39. Wang, H.; González-Fialkowski, J.; Li, W.; Xie, Q.; Yu, Y.; Xu, X.* Liquid-Phase Peak Force Infrared Microscopy for Chemical Nano-imaging and Spectroscopy, **Analytical Chemistry** 2021, 93, 7, 3567–3575. DOI: 10.1021/acs.analchem.0c05075
38. Li, M.; Yu, Y.* Innate Immune Receptor Clustering and Its Role in Immune Regulation, **Journal of Cell Science** 2021, 134:jcs249318. DOI: 10.1242/jcs.249318
37. Li, M.; Wang, H.; Li, W.; Xu, X. G.; Yu, Y.* Macrophage Activation on "Phagocytic Synapse" Arrays: Spacing of Nanoclustered Ligands Directs TLR1/2 Signaling with an Intrinsic Limit, **Science Advances** 2020, 6, eabc8482. DOI: 10.1126/sciadv.abc8482
36. Wiemann, J.; Shen, Z.; Ye, H.; Li, Y.;* Yu, Y.* Membrane Poration, Wrinkling, and Compression: Deformations of Lipid Vesicles Induced by Amphiphilic Janus Nanoparticles, **Nanoscale** 2020, 12, 20326-20336. DOI: 10.1039/D0NR05355D
35. Li, W.; Wang, H.; Xu, X. G.*; Yu, Y.* Simultaneous Nanoscale Imaging of Chemical and Architectural Heterogeneity on Yeast Cell Wall Particles, **Langmuir** 2020, 36, 6169-77. DOI: 10.1021/acs.langmuir.0c00627
34. Li, W.; Yan, J.; Yu, Y.* Geometrical reorganization of Dectin-1 and TLR2 on single phagosomes alters their synergistic immune signaling, **Proceedings of the National Academy of Sciences USA** 2019, 116, 25106-114. DOI: 10.1073/pnas.1909870116

33. Yu, Y.-q.; Li, M.; Yu, Y.* Tracking Single Molecules in Biomembranes: Is Seeing Always Believing? **ACS Nano**, 2019, 13, 10860-8. DOI: 10.1021/acsnano.9b07445
32. Lee, K.; Yu, Y.* Lipid Bilayer Disruption Induced by Amphiphilic Janus Nanoparticles: The Non-Monotonic Effect of Charged Lipids, **Soft Matter**, 2019, 15, 2373-80. DOI: 10.1039/C8SM02525H
31. Yu, Y.-q.; Gao, Y.; Yu, Y.* "Waltz" of Cell Membrane-Cloaked Nanoparticles on Lipid Bilayers: Resolving Rotational Dynamics in Binding-Induced Confinement, **ACS Nano**, 2018, 12, 11871-80. DOI: 10.1021/acsnano.8b04880
30. Lee, K.; Yu, Y.* Lipid Bilayer Disruption by Amphiphilic Janus Nanoparticles: The Role of Janus Balance, **Langmuir**, 2018, 34, 12387-93. DOI: 10.1021/acs.langmuir.8b02298
29. Gao, Y.; Anthony, S. M.; Yi, Y.; Yu, Y.* Cargos Rotate at Microtubule Intersections during Intracellular Trafficking, **Biophysical Journal** 2018, 114, 1-10. DOI: 10.1016/j.bpj.2018.05.010
28. Lee, K.; Zhang, L.; Yi, Y.; Wang, X.; Yu, Y.* Rupture of Lipid Membranes Induced by Amphiphilic Janus Nanoparticles, **ACS Nano** 2018, 12, 3646-57. DOI: 10.1021/acsnano.8b00759
27. Jones, S.;† Huynh, A.;† Gao, Y.; Yu, Y.* Calcium Ion-Assisted Lipid Tubule Formation, **Materials Chemistry Frontiers** 2018, 2, 603-8. DOI: 10.1039/C7QM00521K
† Undergraduate researchers
26. Gao, Y.; Anthony, S. M.; Yi, Y.; Li, W.; Yu, Y.-q.; Yu, Y.* Single-Janus Rod Tracking Reveals the "Rock-and-Roll" of Endosomes in Living Cells, **Langmuir** 2018, 34, 1151-58. DOI: 10.1021/acs.langmuir.7b02804
25. Lee, K.; Yu, Y.* Janus Nanoparticles for T Cell Activation: Clustering Ligands to Enhance Stimulation, **Journal of Materials Chemistry B**, 2017, 5, 4410-15. DOI: 10.1039/C7TB00150A
24. Sanchez, L.; Yi, Y.; Yu, Y.* Effect of Partial PEGylation on Particle Uptake by Macrophages, **Nanoscale**, 2017, 9, 288-97. DOI: 10.1039/C6NR07353K
23. Gao, Y.; Yu, Y.-q.; Sanchez, L.; Yu, Y.* Seeing the Unseen: Imaging Rotation in Cells with Designer Anisotropic Particles, **Micron** 2017, 101, 123-31. DOI: 10.1016/j.micron.2017.07.002
22. Yi, Y.; Sanchez, L.; Gao, Y.; Lee, K.; Yu, Y.* Interrogating Cellular Functions with Designer Janus Particles, **Chemistry of Materials** 2017, 29, 1448-60. DOI: 10.1021/acs.chemmater.6b05322
21. Chamber, M.;† Mallory, S. A.; Malone, H.; Gao, Y.; Anthony, S. M.; Yi, Y.; Cacciuto, A.;* Yu, Y.* Lipid membrane-assisted condensation and assembly of amphiphilic Janus particles, **Soft Matter** 2016, 12, 9151-7. DOI: 10.1039/C6SM02171A
† Undergraduate researcher
20. Lee, K.; Yi, Y.; Yu, Y.* Remote control of T cell activation using magnetic Janus particles, **Angewandte Chemie** 2016, 55, 7384-7. DOI: 10.1002/anie.201601211
19. Yi, Y.; Sanchez, L.; Gao, Y.; Yu, Y.* Janus particles for biological imaging and sensing, **Analyst**, 2016, 141, 3526-39. DOI: 10.1039/c6an00325g
18. Sanchez, L.; Patton, P.; Anthony, S. M.; Yi, Y.; Yu, Y.* Tracking single particle rotation during macrophage uptake. **Soft Matter** 2015, 11, 5346-52. DOI: 10.1039/C5SM00893J
17. Gao, Y.; Yu, Y.* Macrophage uptake of Janus particles depends on Janus balance. **Langmuir** 2015, 31, 2833-38. DOI: 10.1021/la504668c
16. Anthony, S.M.; Yu, Y.* Tracking single particle rotation: Probing dynamics in four dimensions, **Analytical Methods** 2015, 7, 7020-28. DOI: 10.1039/C5AY00522A
15. Chen, B.; Jia, Y.; Gao, Y.; Sanchez, L.; Anthony, S. M.; Yu, Y.* Janus particles as artificial antigen-presenting cells for T cell activation. **ACS Applied Materials and Interfaces** 2014, 6, 18435-9. DOI: 10.1021/am505510m

14. Sizovs, A.; Song, X.; Waxham, M. N.; Jia, Y.; Feng, F.; Chen, J.; Wicker, A. C.; Yu, Y.; Wang, J.* Precisely Tunable Engineering of Sub-30 nm Monodisperse Oligonucleotide Nanoparticles. **Journal of American Chemical Society** 2014, *136*, 234-240. DOI: 10.1021/ja408879b
13. Gao, Y. and Yu, Y.* How Half-Coated Janus Particles Enter Cells. **Journal of American Chemical Society** 2013, *135*, 19091-4. DOI: 10.1021/ja410687z

Book Chapters:

12. Yi, Y.; Lee, K.; Sanchez, L.; Yu, Y.* Janus Particles for Biomedical Applications. In *Soft, Hard and Hybrid Janus Structures*; Lin, Z., Li, B., Eds.; World Scientific (Europe): London, 2017; pp 405-449.

Publications prior to 2012:

11. Yu, Y.* Smoligovets, A. A.; Groves, J. T.* Modulation of T cell signaling by the actin cytoskeleton. **Journal of Cell Science** 2013, *126*, 1049-58. DOI: 10.1242/jcs.098210
10. Caculitan, N. G.; Kai, H.; Liu, E. Y.; Fay, N.; Yu, Y.; Lohmuller, T.; O'Donoghue, G. P.; Groves, J. T. Size-based chromatography of signaling clusters in a living cell membrane. **Nano Letters** 2014, *14*, 2293-98.
Highlight: **Nature Chemical Biology** 2014, *10*, 408. DOI: 10.1021/nl404514e
9. Yu, Y.; Fay, N. C.; Smoligovets, A. A.; Wu, H.; Groves, J. T. Myosin IIA modulates T cell receptor transport and CasL phosphorylation during early immunological synapse formation. **PLoS ONE** 2012, *7*, e30704. DOI: 10.1371/journal.pone.0030704
8. Yu, Y.; Anthony, S. M.; Bae, S. C.; Granick, S. How liposomes diffuse in a concentrated liposome suspension. **Journal of Physical Chemistry B.**, 2011, *115*, 2748-53. DOI: 10.1021/jp109146s
7. Yu, Y.; Vroman, J. A.; Bae, S. C.; Granick, S. Vesicle budding induced by pore-forming peptide. **Journal of American Chemical Society** 2010, *132*, 195-201. DOI: 10.1021/ja9059014
Highlight: **Nature**, 2010, *463*, 439-40
6. Yu, Y.; Granick, S. Pearling of lipid vesicles induced by nanoparticles. **Journal of American Chemical Society** 2009, *131*, 14158-59. DOI: 10.1021/ja905900h
5. Yu, Y.; Anthony, S. M.; Bae, S. C.; Luijten, E.; Granick, S. Biomolecular science of liposome-nanoparticle constructs. **Molecular Crystals Liquid Crystals** 2009, *507*, 18-25. DOI: 10.1080/15421400903048024
4. Campbell, A. S.; Yu, Y.; Granick, S.; Gewirth, A. A. PCB association with model phospholipid bilayers. **Environmental Science and Technology** 2008, *42*, 7496-501. DOI: 10.1021/es8011063
3. Yu, Y.; Anthony, S. M.; Bae, S. C.; Granick, S. Cationic nanoparticles stabilize zwitterionic liposomes better than anionic ones. **Journal of Physical Chemistry C.** 2007, *111*, 8233-36. DOI: 10.1021/jp072680z
2. Zhang, L.; Hong, L.; Yu, Y.; Bae, S. C.; Granick, S. Nanoparticle-assisted surface immobilization of phospholipid liposomes. **Journal of American Chemical Society.** 2006, *128*, 9026-27. DOI: 10.1021/ja062620r
1. Zhang, J.; Yu, Y.; Wan, X.; Chen, X.; Zhou, Q.-F. Synthesis of an optically active triblock copolymer and its self-assembly behavior in dioxane/water. **Acta Polymerica Sinica** 2005, *1*, 305-308.

PATENTS

1. Yu, Y. Artificial antigen-presenting cells and methods for producing and using the same, PCT/US2015/051756, claiming priority to US provisional patent application No. 62/054,831 (2014).

2. Yu, Y.; Lee, S. Multi-channel reporter particle and methods of making and using the same. US provisional application No. 63/245,646 (2021).
3. Yu, Y.; Wiemann, J. Antibiotic amphiphilic nanoparticle and methods of using the same against Gram-negative and/or Gram-positive bacteria. US provisional application No. 63/307,890 (2021).

PRESENTATIONS (*upcoming talks are in italic*)

76. *Invited seminar, Renal Research Conference, Indiana University School of Medicine, 12/2022*
75. Invited seminar, Biomedical Science and Engineering Seminar Series, Massachusetts General Hospital – Harvard University, 11/2022
74. Invited seminar, University of Michigan, 11/2022
73. Invited seminar, “Light” Lectureship, Center for Chemical Imaging in Biomedicine, University of Cincinnati, 11/2022
72. Invited seminar, University of Illinois, Chicago, 09/2022
71. Invited speaker at 2 symposia, ACS National Meeting, 08/2022
70. Invited seminar, Kyoto University, Japan, 08/2022
69. Invited seminar, Osaka University, Japan, 07/2022
68. Invited seminar, Institute for Molecular Science, Okazaki, Japan, 07/2022
67. Invited seminar (virtual), Westlake University, Hangzhou, China, 06/2022
66. Invited speaker, Biointerface Science Gordon Research Conference (GRC), Italy, 06/2022
65. Invited seminar, Nanobiology Institute, Yale University, 05/2022
64. Invited seminar, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, 03/2022.
63. **Student-selected speaker**, Middle Tennessee State University, Department of Chemistry, 02/2022
62. **Student-selected speaker**, IUPUI, Department of Biology, 02/2022
61. Invited seminar, University of Arkansas, Department of Physics, 02/2022
60. Invited speaker, Symposium “Nanoscale Approaches to Biology”, Biophysical Society Meeting, 02/2022
59. Invited speaker, Symposium “Janus Materials towards Functional Superstructures”, PacifiChem, 12/2021(virtual)
58. Invited seminar, Department of Chemistry, University of Arkansas, 12/2021
57. Invited seminar, Department of Chemistry, Purdue University, 11/2021
56. Invited seminar, Department of Chemistry, Eastern Kentucky University, 11/2021
55. Invited speaker, Chemistry and Dynamics in Complex Environments (Chem DiCE), Tellurides Science Research Center (TSRC), Tellurides, CO, 06/2021
54. Invited seminar, Wesleyan University, Department of Chemistry, 10/2020 (virtual)
53. Invited speaker, Global Symposium on Janus Particles, 10/2020 (virtual)
52. Invited speaker, Symposium “Nanotechnology, Single Molecule and Single Cell Imaging in Biology and Medicine”, ACS Meeting, Philadelphia, PA, 03/2020 (cancelled due to COVID)
51. Invited speaker, Quantitative Methods in Understanding Cellular Transport Workshop, New Orleans, LA, 02/2020
50. NSF Nanoscale Science and Engineering Grantees Conference, Alexandria, VA, 12/2019
49. Invited speaker, Biomedical Engineering Seminar, Ohio University, Athens, OH, 11/2019
48. Invited speaker, Chemistry and Dynamics in Complex Environments (Chem DiCE), Tellurides Science Research Center (TSRC), Tellurides, CO, 06/2019

47. Invited speaker, Symposium "Interdisciplinary Chemistry for New Frontiers in Biology and Medicine", American Chemical Society Meeting, Orlando, FL, 03/2019
46. Invited speaker, Symposium "Emerging Frontiers in Fluorescence Microscopy, From Single Molecules to Super-Resolution", American Chemical Society Meeting, Orlando, FL, 03/2019
45. Invited seminar, University of Tennessee - Knoxville, Department of Chemical and Biomolecular Engineering, 03/2019
44. Invited speaker, Quantitative Methods in Understanding Cellular Transport Workshop, New Orleans, LA, 02/2019
43. Invited seminar, University of California – Los Angeles, Department of Chemistry, 02/2019
42. Invited seminar, University of Pennsylvania, Department of Chemical and Biomolecular Engineering, 10/2018
41. Invited seminar, University of Maryland, Department of Chemistry, 10/2018
40. Invited speaker, Symposium "Technical Developments & Applications of Optical Chemical Imaging", American Chemical Society Meeting, Boston, MA, 08/2018
39. Invited seminar, University of Chicago, Department of Chemistry, 05/2018
38. Invited seminar, Cornell University, Biophysics Colloquium, 05/2018
37. Invited seminar, Lehigh University, Department of Chemistry, 04/2018
36. Invited seminar, Pennsylvania State University, Department of Chemistry, 04/2018
35. Invited seminar, Stanford University, Department of Chemistry, 04/2018
34. Invited seminar, Emory University, Department of Chemistry, 03/2018
33. Invited seminar, Georgia State University, Department of Chemistry, 03/2018
32. Invited seminar, Georgia Institute of Technology, Department of Chemistry, 03/2018
31. Invited seminar, North Carolina State University, Department of Chemical and Biomolecular Engineering, 03/2018
30. Invited seminar, University of California – San Diego, Department of NanoEngineering, 02/2018
29. Invited seminar, University of Illinois at Urbana-Champaign, Department of Chemistry, 02/2018
28. Invited seminar, University of Texas at Austin, Biophysics Colloquium, 01/2018
27. Invited seminar, Princeton University, Department of Chemistry, 04/2017
26. Invited speaker, Symposium "Janus Particles: Synthesis, Characterization & Applications", American Chemical Society Meeting, San Francisco, CA, 04/2017
25. Invited speaker, Symposium "Biomaterials for Immunotherapy", American Chemical Society Meeting, San Francisco, CA, 04/2017
24. Invited seminar, IUPUI, Department of Chemistry and Chemical Biology, student-selected speaker, 11/2016
23. Invited seminar, Purdue University, Department of Chemistry, 11/2016
22. Invited seminar, University of Vermont, Department of Molecular Physiology & Biophysics, 09/2016
21. Invited speaker, Symposium "Imaging Nanoparticles and their Assemblies", American Chemical Society Meeting, Philadelphia, PA, 08/2016
20. Invited speaker, Symposium: Analyzing and controlling cell-material interactions, American Chemical Society Meeting, Philadelphia, PA, 08/2016
19. Invited seminar, Chinese Academy of Sciences, Institute of Chemistry, Frontiers of Molecular Science Lecture, 06/2016
18. Invited seminar, Peking University, Department of Chemistry, 06/2016
17. Invited speaker, Colloid and Surface Science Symposium, Cambridge, MA, 06/2016

16. **Student-selected Keynote speaker**, University of Toronto, Chemical Biophysics Symposium, 05/2016
15. Invited speaker, Symposium “Janus Materials: Design, Fabrication and Properties”, The International Chemical Congress of Pacific Basin Societies (PacifiChem), Honolulu, HI, 12/2015
14. Invited seminar, University of Notre Dame, Department of Chemistry, Lilly Endowment Analytical Sciences Seminar, 12/2015
13. Invited seminar, Boston University, Department of Chemistry, 11/2015
12. Invited speaker, Colloid and Surface Science Symposium, Pittsburgh, PA, 06/2015
11. Invited speaker, Gordon Research Conference - Self-Assembly & Supramolecular Chemistry, Lucca, Italy, 05/2015
10. Invited speaker, American Chemical Society National Meeting, Denver, CO, 03/2015
9. Invited speaker, Biophysical Society Meeting, Baltimore, MD, 02/2015
8. Invited seminar, Purdue University, Department of Physics, 12/2014
7. Invited speaker, Materials Research Society, Boston, MA, 12/2014
6. Invited seminar, IUPUI, Department of Physics, 09/2014
5. Invited seminar, Watanabe Symposium, Indiana University, 10/2014
4. **Student-selected speaker**, Northern Kentucky University, 04/2014
3. Invited speaker, American Chemical Society National Meeting, Indianapolis, IN, 09/2013
2. Invited speaker, American Chemical Society National Meeting, New Orleans, LA, 04/2013
1. Invited speaker, Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Kansas City, MO, 09/2012

RESEARCH FUNDING

Pending

- 2023-2028 NIH-NIGMS R35 renewal, “How the Endocytic Network Mediates Specificity of Cell Signaling”
 Role: sole PI
 Amount of Award: \$2,468,969

Current

- 2022-2025 NSF-CBET, "Collaborative Research: Using Anisotropic Surface Coating of Nanoparticles to Tune Their Antimicrobial Activity"
 Role: PI (co-PI: Li)
 Amount of Award: \$621,367 (\$419,985 to Yu)
- 2022-2024 NIH-NIAID R21, “Real-time single particle analysis of reovirus-membrane interactions that drive infection”
 Role: PI (multi-PI: Danthi)
 Amount of Award: \$403,356 (\$201,678 to Yu)
- 2022-2023 Research Corporation for Science Advancement, Scialog Program, “Elucidating the polygenic origins of schizophrenia: Linking protein trafficking to synapse function”
 Role: PI (multi-PI: Gupton and Komor)
 Amount of Award: \$165,000 (\$55,000 to Yu)
- 2017-2023 NIH-NIGMS, 1R35GM124918, “Unravelling Mechanisms of Endosomal Signaling with Designer Nanomaterials”
 Role: sole PI

Amount of Award: \$1,968,750

Completed

- 2016-2017 Indiana CTSI Core Pilot/ NIH UL1TR001108, "Developing Ligand-Clustered Artificial Antigen-Presenting Cells for Adoptive T Cell Therapy: The Use of Core CTSI Facilities"
Role: sole PI
Amount of Award: \$10,000
- 2017-2019 NIH-NIAID, R03AI130751, "Decoupling Receptor Clusters and Signaling Crosstalk in Phagosome Membranes"
Role: sole PI
Amount of Award: \$145,209
- 2016-2020 Research Corporation for Science Advancement, Cottrell Scholar Program, "Exploiting Nanomaterials to Unravel Trafficking inside Cells"
Role: sole PI
Amount of Award: \$100,000
- 2017-2022 NSF-CBET, 1705384, "Correlating Nanoparticle-Induced Biomembrane Perturbation with Heterogeneous Surface Chemistry"
Role: sole PI
Amount of Award: \$350,000
- 2016-2022 NSF-CBET, 1554078, "CAREER: The Role of Surface Anisotropy in the Cellular Entry of Janus Particles"
Role: sole PI
Amount of Award: \$500,000
- 2017-2022 Alfred P. Sloan Foundation, Sloan Research Fellow
Role: sole PI
Amount of Award: \$60,000

TEACHING AND MENTORING

Publications on Education and Mentoring:

1. Flood, A.H.; Skrabalak, S.E.; Yu, Y. Individual development plans — experiences made in graduate student training. *Anal. Bioanal. Chem.* 2021, *413*, 5681–5684. DOI: 10.1007/s00216-021-03540-z

Curriculum Innovation:

- Developed a new undergraduate course: *Chemistry in Art* (offered in FA2019, SP2020, and SP2022 under course name *The World as Chemistry*)
- Developed a new multi-week undergraduate lab *Liposome Antibiotics* for *Principles of Chemistry and Biochemistry Laboratory*, in collaboration with Dr. Jill Robinson.
- Developed "X-factor of P-Chem" for teaching *Introductory Physical Chemistry*
- Developed new curriculum for graduate course *Fundamentals of Materials - Soft and Biological Materials*

Courses Taught:

Undergraduate courses

- The World as Chemistry – Chemistry in Art (3 credits), Fall 2019 (26 enrolled), Spring 2021 (25 enrolled), Spring 2022 (20 enrolled)
- Introduction to Chemical Principles Laboratory (2 credits), Spring 2019 (192 enrolled)

- Introductory Physical Chemistry (3 credits), Fall 2012 (48 enrolled), Fall 2013 (50 enrolled), Fall 2014 (53 enrolled), Fall 2015 (53 enrolled), Fall 2016 (39 enrolled)

Graduate courses

- Fundamentals of Materials – Soft and Biological Materials (3 credits), Spring 2016 (11 enrolled), Spring 2017 (18 enrolled), Fall 2018 (28 enrolled), Fall 2020 (19 enrolled)
- Materials Chemistry Research Seminar (1 credit), Fall 2014 (2 enrolled), Spring 2018 (8 enrolled), Fall 2019 (12 enrolled)
- Journal Club in Quantitative Chemical Biology (1 credit), graduate level, Fall 2012 (10 enrolled), Fall 2018 (13 enrolled), Co-teaching

SERVICE

Service to the Profession

- Journal Editorial Advisory Board: ACS Applied Nano Materials
- Journal Referee:
Nature, Journal of the American Chemical Society, ACS Nano, Chemical Communications, Langmuir, ACS Applied Materials and Interfaces, Biophysical Journal, Chemical Science, Nano Letters, Journal of Physical Chemistry B, Plos One, Analytical Chemistry, Angewandte Chemie, Biochemistry, Physical Chemistry Chemical Physics, Advanced Functional Materials, Science Advances, ACS Biomaterials Science & Engineering, Cell Reports, Nature Communications, etc.
- Grant Referee:
(1) Reviewer panelist for National Science Foundation, Division of Materials Research in 2020, CBET-Nanoscale Interactions in 2020 and 2022
(2) Grant reviewer for Allen Institute, 2022
(3) Grant reviewer for Army Research Office Materials Design program, 2020
(4) Grant reviewer for Czech Science Foundation, 2018
(5) Reviewer panelist for Indiana Clinical and Translational Sciences Institute in 2016 and 2020
(6) Reviewer for Research Corporation for Science Advancement (RCSA) in 2020 and 2022
- Meeting Organization:
(1) Organizer of symposium “Imaging Imaging Biopolymers and Biological Assemblies in Living Systems”, ACS Meeting, March 2023
(2) Organizer of subgroup symposium “Nanoscale ImmunoBiophysics”, Cell Biol ASCB Meeting, Washington, DC, Dec 2022
(3) Organizer of symposium “Analyzing and controlling cell-material interactions”, American Chemical Society National Meeting, Philadelphia, PA, Aug 2016
(4) Organizer of symposium “High-resolution spectroscopy for bioanalysis”, American Chemical Society National Meeting, Indianapolis, IN, Sep 2013
(5) Organizer of SAS applied spectroscopy focal point session, Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Kansas City, MO, September 2012
(6) Secretary for American Chemical Society-Southern Indiana Local Section, 2013
- Professional Membership:
American Chemical Society, Biophysical Society, American Society for Cell Biology

Service to the University, School and Department

- Prepared and submitted proposal as PI for the NSF Research Experiences for Undergraduates (REU) program, 08/2019
- Director of Research Experiences for Undergraduates (REU), Department of Chemistry, 2019-2020
- Faculty Search Committee, Department of Chemistry, 2022
- Chair Search Committee, Department of Environmental and Occupational Health, School of Public Health, 2022
- Policy Committee, Department of Chemistry, 2020-present
- Faculty IT Advisory Council, College of Arts and Sciences, Indiana University, 2019-2021
- Diversity Affairs Committee, Department of Chemistry, 2018-2020
- Organizer for Annual Materials Research Symposium, Indiana University, 2017-2019
- Panelist, OVPR CAREER Workshop, 2017 & 2022
- Faculty mentor in IU-MSI (Minority Serving Institutions) STEM Initiative
- Faculty mentor for the Women in STEM Research program
- Faculty mentor for the McNair Scholars Program
- Faculty mentor for the Jim Holland Summer Research Program for underrepresented minority high school students

Service to Non-Academic Communities and Agencies

- “NanoDays” Outreach at WonderLab Museum, 2013-2016
- Outreach at Bloomington Development and Learning Center, 2017
- “Biomaterials Ambassadors” outreach trips to middle and high schools in rural Indiana, 2014 and 2015
- Outreach at Science Fest, Indiana University, 2021
- Outreach at Science Fest, Indiana University, 2022