

## Yan Yu

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### EDUCATION

- 2009 Ph.D. Materials Science and Engineering, University of Illinois at Urbana-Champaign  
Dissertation: Dynamics and structures of phospholipid assemblies
- 2004 B.S. Chemistry, Peking University, P. R. China  
Dissertation: Synthesis of an optically active triblock copolymer and its self-assembly behavior

### EXPERIENCE

- 2013-present Affiliate, Department of Molecular and Cellular Biochemistry, Indiana University-Bloomington
- 2012-present 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

- 2017 NIH Maximizing Investigators' Research Award (MIRA)
- 2017 Trustees Teaching Award, Indiana University
- 2017 Alfred P. Sloan Research Fellow
- 2016 Cottrell Scholar, Research Corporation for Science Advancement
- 2016 NSF CAREER Award
- 2013-7 Provost Travel Award for Women in Science, Indiana University
- 2003 May Fourth Scholarship, Peking University
- 2002 Hosogoe Scholarship, Peking University
- 2002 Presidential Research Scholars, Peking University
- 2001 Hosogoe Scholarship, Peking University

### PUBLICATIONS

**Independent publications:** (\*indicates corresponding author; † indicates undergraduate coauthors)

17. Lee, K.; Zhang, L.; Yi, Y.; Wang, X.; Yu, Y.\* Rupture of Lipid Membranes Induced by

Amphiphilic Janus Nanoparticles, *ACS Nano*, **2018**, in press.

16. Jones, S.;† Huynh, A.;† Gao, Y.; Yu, Y.\* Calcium Ion-Assisted Lipid Tubule Formation, *Mater. Chem. Front.* **2018**, in press.  
† *Undergraduate researchers*
15. 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.
14. 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.
13. Lee, K.; Yu, Y.\* Janus Nanoparticles for T Cell Activation: Clustering Ligands to Enhance Stimulation, *J. Mater. Chem. B*, **2017**, 5, 4410-15.
12. Yi, Y.; Sanchez, L.; Gao, Y.; Lee, K.; Yu, Y.\* Interrogating Cellular Functions with Designer Janus Particles, *Chem. Mater.* **2017**, 29, 1448-60.
11. (Book chapter) 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.
10. Sanchez, L.; Yi, Y.; Yu, Y.\* Effect of Partial PEGylation on Particle Uptake by Macrophages, *Nanoscale*, **2017**, 9, 288-97.
9. 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.  
† *Undergraduate researcher*
8. Lee, K.; Yi, Y.; Yu, Y.\* Remote control of T cell activation using magnetic Janus particles, *Angew. Chem. Int. Ed.* **2016**, 55, 7384-7.
7. Yi, Y.; Sanchez, L.; Gao, Y.; Yu, Y.\* Janus particles for biological imaging and sensing, *Analyst*, **2016**, 141, 3526-39.
6. Anthony, S.M.; Yu, Y.\* Tracking single particle rotation: Probing dynamics in four dimensions, *Anal. Methods* **2015**, 7, 7020-28.
5. Sanchez, L.; Patton, P.; Anthony, S. M.; Yi, Y.; Yu, Y.\* Tracking single particle rotation during macrophage uptake. *Soft Matter* **2015**, 11, 5346-52.
4. Gao, Y.; Yu, Y.\* Macrophage uptake of Janus particles depends on Janus balance. *Langmuir* **2015**, 31, 2833-38.
3. 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 Appl. Mater. Interfaces* **2014**, 6, 18435-9.
2. 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. *J. Am. Chem. Soc.* **2014**, 136, 234-240.
1. Gao, Y. and Yu, Y.\* How Half-Coated Janus Particles Enter Cells. *J. Am. Chem. Soc.* **2013**, 135, 19091-4.

**Publications from prior work:**

11. Yu, Y.;\* Smoligovets, A. A.; Groves, J. T.\* Modulation of T cell signaling by the actin cytoskeleton. *J. Cell Sci.* **2013**, *126*, 1049-58.
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 Lett.* **2014**, *14*, 2293-98. Highlight: *Nat. Chem. Biol.* **2014**, *10*, 408.
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.
8. Yu, Y.; Anthony, S. M.; Bae, S. C.; Granick, S. How liposomes diffuse in a concentrated liposome suspension. *J. Phys. Chem. B*, **2011**, *115*, 2748-53.
7. Yu, Y.; Vroman, J. A.; Bae, S. C.; Granick, S. Vesicle budding induced by pore-forming peptide. *J. Am. Chem. Soc.* 2010, *132*, 195-201. Highlight: *Nature*, **2010**, *463*, 439-40.
6. Yu, Y.; Granick, S. Pearling of lipid vesicles induced by nanoparticles. *J. Am. Chem. Soc.* **2009**, *131*, 14158-59.
5. Yu, Y.; Anthony, S. M.; Bae, S. C.; Luijten, E.; Granick, S. Biomolecular science of liposome-nanoparticle constructs. *Mol. Cryst. Liq. Cryst.* **2009**, *507*, 18-25.
4. Campbell, A. S.; Yu, Y.; Granick, S.; Gewirth, A. A. PCB association with model phospholipid bilayers. *Environ. Sci. Technol.* **2008**, *42*, 7496-501.
3. Yu, Y.; Anthony, S. M.; Bae, S. C.; Granick, S. Cationic nanoparticles stabilize zwitterionic liposomes better than anionic ones. *J. Phys. Chem. C*. **2007**, *111*, 8233-36.
2. Zhang, L.; Hong, L.; Yu, Y.; Bae, S. C.; Granick, S. Nanoparticle-assisted surface immobilization of phospholipid liposomes. *J. Am. Chem. Soc.* **2006**, *128*, 9026-27.
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 Polym. Sin.* **2005**, *1*, 305-308.

**PATENT**

1. Yu, Y.; Jia, Y.; Chen, B. Artificial antigen-presenting cells and methods for producing and using the same, WIPO application publication WO 2015/2016049210 A1 (2015), claiming priority to US provisional patent application No. 62/054,831 (2014).

**RESEARCH FUNDING****CURRENT**

- 2017-2022 NIH-NIGMS, 1R35GM124918-01, "Unravelling Mechanisms of Endosomal Signaling with Designer Nanomaterials"  
Role: sole PI
- 2017-2020 NSF-CBET, 1705384, "Correlating Nanoparticle-Induced Biomembrane Perturbation with Heterogeneous Surface Chemistry"  
Role: sole PI
- 2017-2019 NIH-NIAID, R03AI130751, "Decoupling Receptor Clusters and Signaling Crosstalk in

Phagosome Membranes”

Role: sole PI

2017-2019 Alfred P. Sloan Foundation, Sloan Research Fellow

Role: sole PI

2016-2021 NSF-CBET, 1554078, “CAREER: The Role of Surface Anisotropy in the Cellular Entry of Janus Particles”

Role: sole PI

2016-2019 Research Corporation for Science Advancement, Cottrell Scholar Program, “Exploiting Nanomaterials to Unravel Trafficking inside Cells”

Role: sole PI

### **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

### **PROFESSIONAL ACTIVITIES**

**Journal Editorial Advisory Board:** ACS Applied Nano Materials

**Journal Referee:** Journal of the American Chemical Society, ACS Nano, Chemical Communications, Langmuir, ACS Applied Materials and Interfaces, Polymer, Journal of Colloid and Interface Science, Biophysical Journal, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Industrial & Engineering Chemistry Research, Analytical Methods, Bioengineering & Translational Medicine, Chemical Science, Nano Letters, Journal of Physical Chemistry B, Plos One, Analytical Chemistry, Angewandte Chemie, ACS Macro Letters, Journal of Leukocyte Biology, Biochemistry.

#### **National and International Services**

- Secretary: American Chemical Society-Southern Indiana Local Section, 2013.
- Symposium Organizer:
  1. SAS applied spectroscopy focal point session, Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Kansas City, MO, September 2012.
  2. “High-resolution spectroscopy for bioanalysis”, American Chemical Society National Meeting, Indianapolis, IN, Sep 2013.
  3. “Analyzing and controlling cell-material interactions”, American Chemical Society National Meeting, Philadelphia, PA, Aug 2016

**Professional Society Memberships:** American Chemical Society, Biophysical Society