Xiaohu Xia, Ph.D.

Assistant Professor, Email: Xiaohu.Xia@ucf.edu
Department of Chemistry, University of Central Florida
Orlando, Florida 32816, United States

EMPLOYMENT

05/2018-present	Assistant Professor, University of Central Florida, Orlando, Florida
08/2014-05/2018	Assistant Professor, Michigan Technological University, Houghton, Michigan

EDUCATION & TRAINING

01/2012-08/2014	Postdoc	Biomedical Engineering, Georgia Tech
10/2009-12/2011	Visiting PhD	Biomedical Engineering, Washington University in St. Louis
09/2006-09/2009	PhD	Biochemistry & Molecular Biology, Xiamen University, China
09/2002-07/2006	BS	Biotechnology, Xiamen University, China

RESEARCH INTERESTS

Design and synthesis of advanced nanomaterials with enhanced properties; Applications of functional nanomaterials in diagnostics, sensing, imaging, and catalysis.

AWARDS & HONORS

2017 National Science Foundation (NSF) CAREER Award
2017 Portage Health Foundation (PHF) Research Award
2017 Research Excellence Fund Award, Michigan Tech

PUBLICATIONS

Independent Publications since 2014

49. **Xia, X.*** Engineered metal nanostructures as emerging materials for in vitro diagnostics. *Chemistry of Materials*, 2018, in submission. (**invited** perspective article for the "Up and Coming" series)
48. Wan, S.; Ye, H.; **Xia, X.*** Pd-Ru bimetallic nanocrystals with a porous structure and their enhanced catalytic properties. *Particle and Particle Systems Characterization*, 2018, DOI 10.1002/ppsc.201700386. (**invited** article for a special issue on Bimetallic Nanoparticles)
47. Gao, Z.; Tao, J.; Tang, D.; Habibi, S.; Minerick, A.; Tang, D.; **Xia, X.*** Platinum decorated gold nanoparticles with dual functionalities for ultrasensitive *in vitro* diagnostics. *Nano Letters*, 2017, *17*, 5572–5579. (It was highlighted by the NSF Science360 News as a top story)
46. Ye, H.; Yang, K.; Tao, J.; Liu, Y.; Zhang, Q.; Habibi, S.; Nie, Z.; **Xia, X.*** An enzyme-free signal amplification technique for ultrasensitive colorimetric assay of disease biomarkers. *ACS Nano*, 2017, *11*, 2052–2059.
45. Li, J.; Gao, Z.; Ye, H.; Wan, S.; Pierce, M.; Tang, D.; **Xia, X.*** A non-enzyme cascade amplification strategy for colorimetric assay of disease biomarkers. *Chemical Communications*, 2017, 56, 9055–9058. (**Cover feature**. It was also highlighted as a **hot article**)
44. Gao, Z.; Liu, G.G.; Ye, H.; Rauschendorfer, R.; Tang, D.; **Xia, X.*** Facile colorimetric detection of silver ions with picomolar sensitivity. *Analytical Chemistry*, 2017, *89*, 3622–3629.
43. Ye, H.; Liu, Y.; Chhabra, A.; Lilla, E.; **Xia, X.*** Polyvinylpyrrolidone (PVP)-capped Pt

nanocubes with superior peroxidase-like activity. *ChemNanoMat*, 2017, *3*, 33–38. (**Invited** article; It was highlighted as a **back cover**)

42. Ye, H.; Wang, Q.; Catalano, M.; Lu, N.; Vermeylen, J.; Kim, M. J.; Liu, Y.; Sun, Y.; **Xia, X.*** Ru nanoframes with an fcc structure and enhanced catalytic properties. *Nano Letters*, 2016, *16*, 2812–2817. (It was **highlighted** by *C&EN* News in the issue of March 28, 2016 and U.S. DOE Office of Science on April 4, 2016)
41. Ye, H.; Mohar, J.; Wang, Q..; Catalano, M.; Kim, M.; **Xia, X.*** Peroxidase-like properties of Ruthenium nanoframes. *Science Bulletin*, 2016, *61*, 1739–1745. (**Invited** article; **Cover feature**)
40. **Xia, X.**;* Zhang, J.; Lu, N.; Kim, M. J.; Ghale, K.; Xu, Y.; Mckenzie, E.; Liu, J.; Ye, H. Pd-Ir core-shell nanocubes: A type of highly efficient and versatile peroxidase mimic. *ACS Nano*, 2015, *9*, 9994–10004. (It was **highlighted** by U.S. DOE office of science and U.S. CDC in Sept. 2015)
39. **Xia, X.**;* Zhang, J.; Sawall, T. A simple colorimetric method for the quantification of Au(III) ions and its use in quantifying Au nanoparticles. *Analytical Methods*, 2015, *7*, 3671–3675.

At Georgia Tech and Washington U.

38. Xia, Y.; Gilroy, K.D.; Peng, H.-C.; **Xia, X.** Seed-mediated growth of colloidal metal nanocrystals. *Angewandte Chemie International Edition*, 2017, *56*, 60–95. (Invited review article)
37. Xia, Y.;* **Xia, X.**; Peng, H.-C. Shape-controlled synthesis of colloidal metal nanocrystals: thermodynamic versus kinetic products. *Journal of the American Chemical Society*, 2015, *137*, 7947–7966. (Invited perspective article)
36. Choi, S.-I.; Herron, J. A.; Scaranto, J.; Huang, H.; Wang, Y.; **Xia, X.**; Lv, T.; Park, J.; Peng, H.; Xia, Y. A comprehensive study of formic acid oxidation on palladium nanocrystals with different types of facets and twin defects. *ChemCatChem*, 2015, *7*, 2077–2084.
35. **Xia, X.**; Figueroa-Cosme, L.; Tao, J.; Peng, H.-C.; Niu, G.; Zhu, Y.; Xia, Y. Facile synthesis of iridium nanocrystals with well-controlled facets using seed-mediated growth. *Journal of the American Chemical Society*, 2014, *136*, 10878–10881.
34. **Xia, X.**; Xia, Y. Gold nanocages as multifunctional materials for nanomedicine. *Frontiers of Physics*, 2014, 9, 378–384.
33. Xu, Y.; Liu, Y.; Wu, Y.; **Xia, X.**; Liao, Y.; Li, Q. Fluorescent probe-based lateral flow assay for multiplex nucleic acid detection. *Analytical Chemistry*, 2014, *86*, 5611–5614.
32. Moran, C. H.; Rycenga, M.; **Xia, X.**; Cobley, C. M.; Xia, Y. Using well-defined Ag nanocubes as substrates to quantify the spatial resolution and penetration depth of SERS imaging. *Nanotechnology*, 2014, *25*, 014007.
31. **Xia, X.**; Xie, S.; Liu, M.; Peng, H.-C.; Lu, N.; Wang, J.; Kim, M. J.; Xia, Y. On the role of surface diffusion in determining the shape or morphology of noble-metal nanocrystals. *Proceedings of the National Academy of Sciences USA (PNAS)*, 2013, *110*, 6669–6673. (Highlighted in *C&EN News*, April 15, 2013, and many other news media)
30. **Xia, X.**; Choi, S. I.; Herron, J. A.; Lu, N.; Scaranto, J.; Peng, H.-C.; Wang, J.; Mavrikakis, M.; Kim, M. J.; Xia, Y. Facile synthesis of Pd right bipyramids and their use as seeds for overgrowth and as catalysts for formic acid oxidation. *Journal of the American Chemical Society*, 2013, *135*, 15706–15709.
29. **Xia, X.**; Wang, Y.; Ruditskiy, A.; Xia, Y. Galvanic replacement: A simple and versatile route to metal nanostructures with tunable and well-controlled. *Advanced Materials*, 2013, *25*, 6313–6333 (for the 25th anniversary issue of *Advanced Materials*)
28. **Xia, X.**; Rycenga, M.; Qin, D.; Xia, Y. A silver nanocube on a gold microplate as a well-defined and highly active substrate for SERS detection. *Journal of Materials Chemistry C*, 2013, *1*, 6145–6150.
27. **Xia, X.**; Xu, Y.; Ke, R.; Zhang, H.; Yang, W.; Zou, M.; Li, Q. A highly sensitive europium

nanoparticle-based lateral flow immunoassay for detection of chloramphenicol residue. *Analytical and Bioanalytical Chemistry*, 2013, *405*, 7541–7544.

26. **Xia, X.**; Li, W.; Zhang, Y.; Xia, Y. Silica-coated dimers of silver nanospheres as SERS tags for imaging cancer cells. *Interface Focus*, 2013, *3*, 20120092.
25. Xia, Y.; **Xia, X.**; Wang, Y.; Xie, S. Shape-controlled synthesis of metal nanocrystals. *MRS Bulletin*, 2013, *38*, 335–344. (Invited review article)
24. Peng, H.-C.; Xie, S.; Park, J.; **Xia, X.**; Xia, Y. Quantitative analysis of the coverage density of Br^- ions on Pd{100} facets and its role in controlling the shape of Pd nanocrystals. *Journal of the American Chemical Society*, 2013, *135*, 3780–3783.
23. Choi, S. I.; Xie, S.; Shao, M.; Odell, J. H.; Lu, N.; Peng, H.-C.; Protsailo, L.; Guerrero, S.; Park. J.; **Xia, X.**; Wang, J.; Kim, M. J.; Xia, Y. Synthesis and characterization of 9-nm Pt-Ni octahedra with a record high activity of 3.3 A/mgPt for the oxygen reduction reaction. *Nano Letters*, 2013, *13*, 3420–3425. (Highlighted at http://nanotechweb.org/cws/article/tech/54111)
22. Wang, Y.; Wan, D.; Xie, S.; **Xia, X.**; Huang, C. Z.; Xia, Y. Synthesis of silver octahedra with controlled sizes and optical properties via seeded growth. *ACS Nano*, 2013, *7*, 4586–4594.
21. Wang, Y.; Liu, Y.; Luehman, H.; **Xia, X.**; Wan, D.; Cutler, C.; Xia, Y. Radioluminescent Au nanocages with controlled radioactivity for real-time multimodality imaging. *Nano Letters*, 2013, *13*, 581–585. (It was highlighted at http://nanotechweb.org/cws/article/tech/52479)
20. Wan, D; **Xia, X.**; Wang, Y; Xia, Y. Robust synthesis of gold cubic nanoframes through a combination of galvanic replacement, gold deposition, and silver dealloying. *Small*, 2013, 9, 3111–3117.
19. Moran, C. H.; **Xia, X.**; Xia, Y. Improving correlated SERS measurements with scanning electron microscopy: An assessment of the problem arising from the deposition of amorphous carbon. *Physical Chemistry Chemical Physics*, 2013, *15*, 5400–5406.
18. Xie, S.; Choi, S.-I; **Xia, X.**; Xia, Y. Catalysis on faceted noble-metal nanocrystals: Both shape and size matter. *Current Opinion in Chemical Engineering*, 2013, *2*, 142–150.
17. **Xia, X.**; Xia, Y. Symmetry breaking during seeded growth of nanocrystals. *Nano Letters*, 2012, *12*, 6038–6042.
16. **Xia, X.**; Zeng, J.; Otejen, L. K.; Li, Q.; Xia, Y. Quantitative analysis of the role played by poly(vinylpyrrolidone) in seed-mediated growth of silver nanocrystals. *Journal of the American Chemical Society*, 2012, *134*, 1793–1801.
15. **Xia, X.**; Yang, M.; Wang, Y.; Zheng, Y.; Li, Q.; Chen, J.; Xia, Y. Quantifying the coverage density of poly(ethylene glycol) chains on the surface of gold nanostructures. *ACS Nano*, 2012, *6*, 512–522.
14. **Xia, X.**; Zeng, J.; Zhang, Q.; Moran, C. H.; Xia, Y. Recent developments in shape-controlled synthesis of silver nanocrystals. *Journal of Physical Chemistry C*, 2012, *116*, 21647–21656. (It was highlighted on the cover)
13. Zhou, Y.;[†] **Xia, X.**;[†] ([†]equal contribution) Xu, Y.; Ke, W.; Y, Wei.; Li, Q. Application of Eu(III) chelates-bonded silica nanoparticles in time-resolved immunofluorometric detection assay for human thyroid stimulating hormone. *Analytica Chimica Acta*, 2012, *722*, 95–99.
12. Wang, Y.; Liu, Y.; Luehman, H.; **Xia, X.**; Brown, P. K.; Jarreau, C.; Welch, M. J.; Xia, Y. Evaluating the pharmacokinetics and in vivo cancer targeting capability of Au nanocages by positron emission tomography imaging. *ACS Nano*, 2012, *6*, 5880–5888.
11. Wang, Y.; Xu, J.; **Xia, X.**; Yang, M.; Vangveravong, S.; Chen, J.; Mach, R. H.; Xia, Y. SV119-gold nanocage conjugates: A new platform for targeting cancer cells via sigma-2 receptors. *Nanoscale*, 2012, *4*, 421–424.
10. Zhang, Q.; Moran, C. H.; **Xia, X.**; Rycenga, M.; Li, N.; Xia, Y. Synthesis of Ag nanobars in the presence of single-crystal seeds and a bromide compound, and their SERS properties. *Langmuir*, 2012, *28*, 9047–9054.

9. Zeng, J.; **Xia, X.**; Zhang, Q.; Wang, Y.; Xia, Y. Controlling the evolution of cubic Ag seeds into nanocrystals with different morphologies. *Scientia Sinica Chimica*, 2012, *42*, 1505–1512. (Invited review article)
8. **Xia, X.**; Zeng, J.; McDearmon, B.; Zheng, Y.; Li, Q.; Xia, Y. Silver nanocrystals with concave surfaces and their optical and surface-enhanced Raman scattering properties. *Angewandte Chemie International Edition*, 2011, *50*, 12542–12546. (It was highlighted on the inside cover)
7. **Xia, X.**; Yang, M.; Oetjen, L. K.; Zhang, Y.; Li, Q.; Chen. J.; Xia, Y. An enzyme-sensitive probe for photoacoustic imaging and fluorescence detection of protease activity. *Nanoscale*, 2011, *3*, 950–953. (It was highlighted as a hot paper)
6. Zeng, J.;† **Xia, X.**;† (†equal contribution) Rycenga, M.; Henneghan, P.; Li, Q.; Xia, Y. Successive deposition of silver on silver nanoplates: Lateral versus vertical growth. *Angewandte Chemie International Edition*, 2011, *50*, 244–249. (It was selected by the editors as a VIP article)
5. Rycenga, M.;† **Xia, X.**;† (†equal contribution) Moran, C.; Zhou, F.; Qin, D.; Li, Z.-Y.; Xia, Y. Generation of hot spots with silver nanocubes for single-molecule detection by surface-enhanced Raman scattering. *Angewandte Chemie International Edition*, 2011, *50*, 5473–5477. (It was highlighted as a hot paper)
4. Xia, Y.; Li, W.; Cobley, C. M.; Chen, J.; **Xia, X.**; Zhang, Q.; Yang, M.; Cho, E. C.; Brown, P. K. Gold Nanocages: from synthesis to theranostic applications. *Accounts of Chemical Research* 2011, *44*, 914–924. (Invited review article, it was also highlighted in C&EN News, Sept. 26th)
3. Zhang, H.; **Xia, X.**; Li, W.; Zeng, J.; Dai, Y.; Yang, D.; Xia, Y. Facile synthesis of five-fold, starfish-like rhodium nanocrystals by eliminating oxidative etching with a chloride-free precursor. *Angewandte Chemie International Edition*, 2010, *49*, 5296–5300. (It was highlighted in *Nature Materials*, 2010, 9, p. 605)
2. Ke, R.; Yang, W.; **Xia, X.**; Xu, Y.; Li, Q. Tandem conjugation of enzyme and antibody on silica nanoparticle for enzyme immunoassay. *Analytical Biochemistry*, 2010, *406*, 8–13.
1. **Xia, X.**; Xu, Y.; Zhao, X.; Li, Q. Lateral flow immunoassay using europium chelate-loaded silica nanoparticles as labels. *Clinical Chemistry*, 2009, *55*, 179–182.

SELECTED CONFERENCE PRESENTATIONS

1. Noble-metal nanostructures for colorimetric diagnostics of cancer biomarkers. Division of Analytical Chemistry, 254th American Chemical Society (ACS) National Meeting, Washington DC, USA, August 2017 (Invited talk).
2. Engineering bimetallic nanocrystals as artificial enzymes for colorimetric detection of disease biomarkers. Division of Colloid and Surface Chemistry, 253rd ACS National Meeting, San Francisco, CA, USA, April 2017 (Invited talk).
3. Kinetic control: a versatile approach for shape-controlled synthesis of metallic nanocrystals. XXV International Materials Research Congress, Cancun, Mexico, August 2016 (Invited talk)
4. Controlling the morphology of noble-metal nanocrystals by manipulating the growth kinetics of a synthesis. Division of Inorganic Chemistry, 245th ACS National Meeting, New Orleans, LA, USA, April 2013 (Session Chair).
5. Controlling the evolution from seeds to nanocrystals. 2013 Materials Research Society (MRS) Meeting, San Francisco, CA, USA, April 2013.

PATENTS

1. **Xia, X.** Pd-Ir core-shell nanostructures as artificial peroxidases. U.S. Patent, Application No. 15/376,513.
2. **Xia, X.** Ru nanoframes with *fcc* crystal structure. U.S. Provisional Patent, Application No. 62/304,769.

3. Li, Q; Xu, Y.; Liu, Y.; **Xia, X.** A new approach to the detection of nucleic acid. Chinese Patent, No. CN102154498A.
4. Lin, Z.; **Xia, X.** Device for fixing adjustable loading detection reagent paper strip plastic parts. Chinese Patent, No. CN201281676.

TEACHING

- CH2212 *Quantitative Analysis*, Spring semesters, 2016-2018 (undergraduate course, 5 credits)
- CH4222 *Bioanalytical Chemistry*, Fall semesters, 2015-2018 (undergraduate course, 5 credits)
- CH1163 *University Chemistry Recitation*, Spring 2015 (first-year undergraduate course, 3 credits)
- CH6290 *Nanomaterials Characterization*, Fall 2014 (graduate course, 5 credits)

SERVICE

- University senator, Michigan Tech (2016-2018)
- Panelist, National Institute of Food and Agriculture, USDA (01/2017; 10/2017)
- Faculty Distinguished Service Award Committee, Michigan Tech (2015-2018)
- Judge for the Undergraduate Research Expo at Michigan Tech (2015-2016)
- Graduate Programs Committee, Department of Chemistry, Michigan Tech. (2014-2015)
- Session Chair, American Chemical Society (ACS) national meeting (spring, 2013 and 2017)
- Reviewer for more than 30 journals such as *Nature Communications*, *Nano Letters*, *ACS Nano*, *Analytical Chemistry*, *Chemistry of Materials*, *Journal of Physical Chemistry*, and *Langmuir*.

GENERAL MEDIA (in independent research career)

- "Color of Chemistry: Xiaohu Xia Wins National Science Foundation (NSF) CAREER Award" Michigan Tech News: http://www.mtu.edu/news/stories/2017/january/color-chemistry-xiaohu-xia-wins-career-award.html NSF Division of Chemistry Newsletter highlights (see page 16): https://www.nsf.gov/pubs/2017/nsf17113/nsf17113.pdf;
- "Test Strips for Cancer Detection Get Upgraded with Nanoparticle" *NSF Science360 News* report on *Nano Letters* 2017, 17, 5572-5579: https://news.science360.gov/obj/story/6b468f84-d891-430f-9cd1-702b2a90c60c/test-strips-cancer-detection-upgraded-nanoparticle
- "A Noble Calling: Ruthenium Nanoframes Open the Doors to Better Catalysts" *C&EN News* report on *Nano Letters* 2016, 16, 2812-2817: http://cen.acs.org/articles/94/i13/Deposition-followed-etching-yields-ruthenium.html?type=paidArticleContent; and *ScienceDaily* News report: https://www.sciencedaily.com/releases/2016/04/160401101807.htm
- "Xia receives research funds from Silicon Valley and the Michigan state government": http://www.mtu.edu/news/stories/2016/september/silicon-valley-mtrac-help-fast-track-commercialization-tech-research.html
- "New Catalyst Yields More Accurate PSA Test" Michigan Tech News report on *ACS Nano* 2015, 9, 9994-10004: http://www.mtu.edu/news/stories/2015/september/new-catalyst-yields-more-accurate-psa-test.html. It was also highlighted by U.S. department of energy (DOE) on Sept. 17, 2015 and U.S. Centers for Disease Control and Prevention (CDC) on Sept. 24, 2015.
- Journal Covers. *Chemical Communications*, 2017, 53, 9055-9058 was selected to be the cover feature: http://pubs.rsc.org/en/content/articlelanding/2017/cc/c7cc90318a#!divAbstract, and was highlighted as a hot article: http://blogs.rsc.org/cc/2017/08/10/hot-chemcomm-articles-for-july-3/. *Science Bulletin* 2016, 61, 1739-1745 was highlighted as the cover feature: https://link.springer.com/journal/11434/61/22/page/1; *ChemNanoMat* 2017, 3, 33-38 was highlighted as a back cover: http://onlinelibrary.wiley.com/doi/10.1002/cnma.201600343/full