Resume

Ruoyu Xu

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EDUCATION

- **Ph.D Chemistry**, University of Chicago *Sept. 2012 ~ June 2018*
  B. S. Chemistry, Peking University *Sept. 2008 ~ July 2012*
  Core Curricula
  Organic/ Physical /Inorganic/Analytical/Polymer/Material Chemistry
  Academic Records
  GPA (Overall): **3.72**/4.00
  GPA (Major): **3.77**/4.00

HONORS AND AWARDS

Kwang-Hua Scholarship (granted to top 6%)	*2011&2009*
First Award of 19th Challenge Cup Campaign (cooperative project)	*2011*
Baosteel Scholarship (granted to top 5%)	*2010*
National Chemistry Olympics, Gold Medal	*2008*

RESEARCH EXPERIENCE

- **Research Assistant**, *University of Chicago* (Advisor: *Prof.* Wenbin Lin) *Jan. 2015 – May 2018*
  Developed and synthesized novel metal-organic nanomaterials for oxygen sensing and catalytic applications.
  - Designed and synthesized a phosphorescence/fluorescence dual-emissive nanoscale metal-organic framework as an intracellular oxygen sensor
  - Designed and synthesized $Ir[(ppy)_2(bpy)]^+$ - and $Ru(bpy)_3^{2+}$ - based 2D metal-organic frameworks as visible-light photocatalysts for photopolymerization and organic photoreactions
  - Immobilized Pybox-ligands onto 2D metal-organic frameworks for enantioselective addition of terminal alkynes to imines

- **Research Assistant**, *University of Chicago (*Advisor: *Prof.* Bozhi Tian*)* *Dec. 2012 - Dec. 2014*
  Devised and fabricated silicon-based novel semiconductor materials for biological purposes, including:
  - Ordered porous silicon aerogels as optoelectronically responsive tissue culture scaffolds
  - Hollow silicon nanotubes with spiny surface with enhanced photothermal property
  - Hollow silicon nanotubes with porous p-i-n wall as biomimetic ion channels

- **Undergraduate Research Assistant**, *Laboratory for Molecular Materials and Polymers, PKU.* (Advisor: *Prof.* Jian Pei) *Dec. 2009 - June 2012*
  - Synthesized a series of functional organic materials, including perylene-diimide derivatives for optical waveguide materials, dithienothiophene/thienopyrrole copolymers for solar cells, and thienoacene derivatives for p-type organic field-effect transistors (OFET), etc.
  - Gained solid experience in organic synthesis and established comprehensive knowledge of structure-properties relationships to further design functional organic/polymer materials

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TEACHING EXPERIENCE

- **Teaching Assistant**, Department of Chemistry, *University of Chicago* *Sept. 2012 - June 2013*
  - Lectured on the theories and experimental skills in the undergraduate Organic Chemistry course
  - Led groups of undergraduate students to conduct organic synthesis experiments in the lab

OUTREACH ACTIVITIES

- **Experiment Demonstrator**, Department of Chemistry, *University of Chicago* *Dec. 2013*
  Demonstrated entertaining experiments to children in the annual public open day of James Frank Institute by Chemistry Department.

SKILLS

- Device Fabrication: Photolithography, Electron Beam Lithography (EBL), E-gun Evaporation, Sputting, Mask Alignment, Spin-Coating, Oxygen Plasma Etching
- Characterization Techniques: Optical Microscopy, TEM, SEM, TGA, DSC, UV/Vis, FT-IR, NMR, PXRD, GC, LC-MS, HPLC, GPC, DLS, BET, EPR, ICP-MS
- Synthetic Techniques: Solvothermal Synthesis, Organic Synthesis, Radical Polymerization, Chemical Vapor Deposition
- Chemical Software: ChemDraw, Origin, Materials Studio, Diamond, ImageJ, Designcad, Microsoft Office

LANGUAGE

- Mandarin, English

PUBLICATIONS

- **Ruoyu Xu**, Youfu Wang, Xiaopin Duan, Kuanda Lu, Daniel Micheroni, Aiguo Hu, and Wenbin Lin. "Nanoscale Metal–Organic Frameworks for Ratiometric Oxygen Sensing in Live Cells." *J. Am. Chem. Soc.* **2016**, *138*, 2158–2161**.**

- **Ruoyu Xu**, Tasha Drake, Guangxu Lan and Wenbin Lin. "Metal-Organic Layers Catalyze Photoreactions without Pore Size and Diffusion Limitations." *Chem. Eur. J. doi:10.1002/chem.201803635*

- **Ruoyu Xu**, Zhengxu Cai, Guangxu Lan and Wenbin Lin. "Metal-Organic Layers Efficiently Catalyze Photoinduced Polymerization under Visible Light." *Inorg. Chem. doi: 10.1021/acs.inorgchem.8b01637*

- Guangxu Lan, Kaiyuan Ni, **Ruoyu Xu**, Kuangda Lu, Zekai Lin, Christina Chan, and Wenbin Lin. "Nanoscale Metal-Organic Layers for Deeply Penetrating X-ray-Induced Photodynamic Therapy." *Angew. Chem. Int. Ed.* **2017**, *56*, 12102-12106.

- Yu Tan, Dylan Richards, Robert C. Coyle, Jenny Yao, **Ruoyu Xu**, Wenyu Gou, Hongjun Wang, Donald . Menick, Bozhi Tian, and Ying Mei. "Cell number per spheroid and electrical conductivity of nanowires influence the function of silicon nanowired human cardiac spheroids". *Acta Biomaterialia*. **2017**, *51*, 495–504.

- Dylan J. Richards, Yu Tan, Robert Coyle, Yang Li, **Ruoyu Xu**, Nelson Yeung, Arran Parker, Donald R. Menick, Bozhi Tian, and Ying Mei. "Nanowires and Electrical Stimulation Synergistically Improve Functions of hiPSC Cardiac Spheroids." *Nano Lett*. **2016**, *16*, 4670−4678.

- Yu Tan, Dylan Richards, **Ruoyu Xu**, Skylar Stewart-Clark, Santhosh Kumar Mani, Thomas Keith Borg, Donald R. Menick, Bozhi Tian, and Ying Mei. "Silicon Nanowire-Induced Maturation of Cardiomyocytes Derived from Human Induced Pluripotent Stem Cells." *Nano Lett*. **2015**, *15*, 2765−2772