

# Chong Xie

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## Profile

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I am currently a postdoctoral fellow in Prof. Charles M. Lieber's group at Harvard University. My research interest is centered on exploring and exploiting nanoelectronics in bio-medical applications with emphasis on brain/neuron science.

## Education

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<b>Ph.D.</b>	Stanford University, Materials Science and Engineering	Oct, 2011
	Dissertation: Nanostructured materials and devices for biological interface	
	Advisor: Prof. Yi Cui, Co-advisor: Prof. Bianxiao Cui	
<b>MS</b>	University of Notre Dame, Physics	Jun 2006
<b>BS</b>	University of Science and Technology of China, Applied Physics	May 2004

## Research experience

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**Postdoctoral Fellow**, Harvard University Sept, 2011-present  
Advisor: Prof. Charles M. Lieber

- Development of a macroporous electronics based neural probe
- Brain activity recording with macroporous electronic neural probe in rodent models
- Study of the chronic interface between the neural probe and brain tissue
- Development of smart materials comprising 3D macroporous electronics

**Ph.D. Student**, Stanford University 2006 to 2011  
Advisor: Prof. Yi Cui, co-advisor: Bianxiao Cui

- Nanopillar based cellular probes:
  - ❖ Development of metallic nanopillar enabled electronics for long-term and minimally invasive intracellular acquisition of cardiomyocyte action potential
  - ❖ Development of highly localized optical probes for fluorescence imaging inside cells
  - ❖ Confinement and growth guidance of cultured neural network with nanopillar patterns
  - ❖ Characterization of cell-nanostructure interface by TEM, FIB, and SEM
- Magnetic manipulation of material transport in cells
  - ❖ Design, fabrication, and characterization of magnetic microfluidic device
  - ❖ Magnetic manipulation of axonal transport in DRG neurons

- Single nanowire electrical characterizations

## Teaching experience

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<b>Stanford University</b>	2008
Teaching Assistant, Materials Science and Engineering	
<b>University of Notre Dame</b>	2004-2006
Teaching Assistant, Physics	

## Honors and awards

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MRS Student Award (Silver)	2011
National Scholarship for Outstanding Students abroad	2011
FMA Fellowship, Stanford University	2007
Undergraduate student scholarship, USTC	2004

## Patents

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1. Multifunctional three-dimensional macroporous nanoelectric networks for "smart" materials, Charles M. Lieber, Jia Liu, **Chong Xie**, and Xiaochuan Dai, US provisional patent filed 04/05/2013
2. "Multiplexed intracellular recording using nanopillar electrodes", Bianxiao Cui, Yi Cui, Ziliang Lin, and **Chong Xie**, US provisional patent filed 02/27/2013

## Presentations

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Three-Dimensional Macroporous Nanowire Nanoelectronic Networks for Brain Probes  
*Materials Research Society Meeting*, Boston, 2013

Three-dimensional macroporous nanowire nanoelectronic network for brain implant  
*Society for Neuroscience Meeting*, San Diego, 2013

Metallic nanopillars for highly efficient electrical cellular interface  
*Materials Research Society Meeting*, Boston, 2011

Nanopillar cellular interface  
*Gordon Research Conference on Nanostructure Fabrication*, Tilton, 2010

Interfacing with neurons by nanoelectrodes  
*Materials Research Society Meeting*, San Francisco, Mar 2010

Local optical probes for the cell interior  
*Materials Research Society Meeting*, San Francisco, Mar 2010

Nanoelectrodes for neuron recording and stimulation

*Biophysical Society Meeting*, San Francisco, Mar 2010

Developing optical probes for the cell interior

*Materials Research Society Meeting*, San Francisco, Mar 2009

### **Manuscripts in preparation**

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4. **C. Xie**, J. Liu, X. Dai, W. Zhou, CM Lieber, Three-dimensional macroporous nanoelectronic networks for minimal invasive neural probe, *manuscript in preparation*
3. W. Zhou, X. Dai, H. Choe, T. Fu, **C. Xie**, J. Liu, CM Lieber, Long-term stability of nanowire-based nanoelectronics for chronic physiological studies, *manuscript in preparation*
2. PD Chowdary, **C. Xie**, D. Che, Y. Osakada, C. Ooi, S. Wang, B. Cui, Magnetic manipulation of axonal transport in live neurons – mechanical force balance and cargo directionality, *manuscript in preparation*
1. Z. Lin, **C. Xie**, Y. Osakada, Y. Cui, B. Cui, Iridium oxide nanotube electrodes for highly sensitive measurement of action potentials, *submitted to Nature Communications*, in second round review

### **Publications**

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14. J. Liu\*, **C. Xie\***, X. Dai\*, L. Jin, W Zhou, CM Lieber, Multifunctional three-dimensional macroporous nanoelectronic networks for smart materials, *PNAS* 110(17), 6694-6699 (2013)
13. L. Hason, Z. Lin, **C. Xie**, Y. Cui, B. Cui, Characterization of the cell-nanopillar interface by transmission electron microscopy, *Nano Letters*, 12, 5815-5820 (2012)
12. **C. Xie\***, Z. Lin\*, L. Hanson, Y. Cui, B. Cui, Intracellular recording of action potentials by nanopillar electroporation, *Nature Nanotechnology* 7, 185-190 (2012)
11. Y. Yao\*, J. Yao\*, V. Narasimhan, Z. Ruan, **C. Xie**, S. Fan, Y. Cui, Broadband light management using low-Q whispering gallery modes in spherical nanoshells, *Nature Communications* 3, 664 (2012)
10. **C. Xie\***, H. Lindsey\*, Y. Cui, B. Cui, Vertical nanopillars for highly-localized fluorescence imaging, *PNAS* 108 (10), 3894-3899, (2011)  
Highlighted in *Nature Methods* 8, 284-285 (2011)
9. S. Han, **C. Xie**, Y. Cui, Microcompression of fused silica nanopillars synthesized using reactive ion etching, *Nanoscience and Nanotechnology Letters* 2, 344-347 (2010)

8. **C. Xie**, L. Hanson, W. Xie, Z. Lin, B. Cui, Y. Cui, "Noninvasive Neuron Pinning with Nanopillar Arrays," *Nano Letters* 10, 4020-4024 (2010)
7. L. Hanson, L. Cui, **C. Xie**, B. Cui, A microfluidic positioning chamber for long-term live-cell imaging, *Microscopy Research and Technique* 74(6), 496-501, (2011)
6. **C. Xie** and Y. Cui, "Nanowire platform for mapping neural circuits" *PNAS* 107 (10), 4489-4490, (2010)
5. K. J. Lai\*, H. L. Peng\*, W. Kundhikanjana, D. T. Schoen, **C. Xie**, S. Meister, Y. Cui, M. A. Kelly, Z. X. Shen, "Nanoscale Electronic Inhomogeneity in In<sub>2</sub>Se<sub>3</sub> Nanoribbons Revealed by Microwave Impedance Microscopy", *Nano Letters* 9, 1265-1269, (2009)
4. Y. Yang, **C. Xie**, R. Ruffo, H. Peng, D. K. Kim, Y. Cui "Single Nanorod Devices for Battery Diagnostics: A Case Study on LiMn<sub>2</sub>O<sub>4</sub>" *Nano Letters* 9, 4109-4114, (2009)
3. H. Peng, **C. Xie**, D. T. Schoen and Y. Cui "Large Anisotropy of Electrical Properties in Layer-Structured In<sub>2</sub>Se<sub>3</sub> Nanowires" *Nano Letters* 7, 1511-1516, (2008)
2. H. Peng, **C. Xie**, D. T. Schoen, K. McIlwrath, X. F. Zhang, Y. Cui "Order Vacancy Compounds and Nanotube Formation in CuInSe<sub>2</sub>-CdS Core-Shell Nanowires" *Nano Letters* 7, 3734-3738, (2007)
1. D. T. Schoen, **C. Xie**, Y. Cui "Electrical Switching and Phase Transformation in Silver Selenide Nanowires" *J. Am. Chem. Soc.* 129, 4116-4117, (2007)

\* Equal contribution

## References

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