

Curriculum Vitae

Chi (Alice) Lu

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Areas of expertise: materials characterization, mechanical characterization, designing fabrication process, flexible electronics, polymers, polymer composites, biocompatible materials

Education

Massachusetts Institute of Technology (MIT) Cambridge, MA
Ph. D. in Materials Science and Engineering (Program in Polymers and Soft Matter) Sep. 2012 - 2017(expected)

University of Illinois at Urbana- Champaign (UIUC) Urbana-Champaign, IL
M.S./B.S. in Engineering May 2012
Major: Materials Science & Engineering - Polymer (James Scholar); Minor: Business Administration

Professional Experience

MIT Department of Materials Science and Engineering Cambridge, MA
Research Assistant in Prof. Polina Anikeeva's Group Oct. 2012 - present

- Flexible optoelectronic probes for stimulation and recording in brain and spinal cord
- Technical areas: materials characterization, microelectronic fabrication, fiber drawing technology, *in vivo* study
- Mentored seven undergraduate researchers (two in Ph.D. program)

UIUC Materials Science and Engineering Urbana-Champaign, IL
Research Assistant in Prof. John Rogers Group Sep. 2007 - May 2012

- Synthesized and characterized conductive polymer composites for application on skin strain sensors
- Designed and fabricated of multifunctional epidermal sensors for cardiac applications

UIUC Materials Science and Engineering Urbana-Champaign, IL
Teaching Assistant of MSE 307, 308 (Materials Laboratory I, II) Aug. 2010 - Dec. 2011

- Prepared lectures and laboratory courses about material characterization for junior students (class size 100+ students)
- Assessed students' performance and provided feedback

Technische Universität Darmstadt Surface Science Darmstadt, Germany
Summer Intern in Dr. Thomas Mayer's Group Jul. 2009 - Aug. 2009

- Fabricated and characterized organic thin-film solar cell to increase energy conversion efficiency

Archers Systems Hsinchu, Taiwan
Intern Jan. 2009 - Feb. 2009

- Measured and examined the surface microstructure of thin-film solar cell
- Tested power conversion efficiency of thin-film solar cell

Skill

- **Laboratory:** materials characterization (SEM, TEM, AFM, XRD, Raman Spectroscopy, FTIR, DSC), cleanroom (PECVD, RIE, E-beam Evaporator), and mechanical characterization (Instron, DMA)
- **Technical:** micro-fabrication, photo lithography, laser setup, machining (CNC lathe, CNC mill, laser cutter, 3D printer, waterjet, polymer molding), spinal cord surgery in rodents, tissue culture, electrophysiology, and immunohistology
- **Computer:** MATLAB, Python, CAD, Solidworks, Photoshop, and Illustrator

Selected Publication, Patent, and Conferences Presentation

Patent:

Methods and apparatus for stimulating and recording neural activity (US 13/919,594)
Publication date: Dec. 18 2014

Publications:

- Lu, C., Park, S., Richner, T., Derry, A., Brown, I., Hou, C., Rao, S., Kang, J., Mortiz, C. T., Fink, Y., Anikeeva, P. *Flexible and Stretchable Nanowire Coated Fibers for Optoelectronic Probing of Spinal Cord Circuits (Accepted by Science Advances, 2017)*
- Lu, C., Frierie, U. P., Koppes, R. A., Canales, A., Caggiano, V., Selvidge, J., Bizzi, E., Anikeeva, P. *Polymer Fiber Probes Enable Optical Control of Spinal Cord and Muscle Function In Vivo (Advanced Functional Materials 2014, IF: 11.8 selected for cover)*
- Lu, N.*, Lu, C.*, Yang, S., Rogers, J. A. *Highly Sensitive Skin-Mountable Strain Gauges Based Entirely on Elastomers (Advanced Functional Materials 2012, IF: 11.8, *authors contributed equally)*

- Park, S., Guo, Y., Jia, X., Choe, H.-K., Grena, B., Kang, J., Park, J., **Lu, C.**, Canales, A., Chen, R., Yim, Y.-S., Choi, G. B., Fin, Y., Anikeeva, P. *One-step optogenetics with multifunctional flexible polymer fibers* (**Nature Neuroscience** **2017**, **IF** **16.724**)
- Canales, A., Jia, X., Froriep, U. P., Koppes, R. A., Tringides, C. M., Selvidge, J., **Lu, C.**, Hou, C., Wei, L., Fink, Y., Anikeeva, P. *Multifunctional fibers for simultaneous optical, electrical and chemical interrogation of neural circuits in vivo* (**Nature Biotechnology** **2015**, **IF: 41.514**, **selected for cover**)
- Xu, L., Gutbrod, S. R., Bonifas, A. P., Su, Y., Sulkin, M. S., Lu, N., Chung, H.J., Jang, K.-I., Liu, Z., Ying, M., **Lu, C.**, Webb, R. C., Kim, J.-S., Laughner, J. I., Cheng, H., Liu, Y., Ameen, A., Jeong, J.W., Kim, G.-T., Huang, Y., Efimov, I. R., Rogers, J. A. *3D multifunctional integumentary membranes for spatiotemporal cardiac measurements and stimulation across the entire epicardium* (**Nature Communications** **2014**, **IF: 11.47**)
- Kim, D.-H., Ghaffari, R., Lu, N., Wang, S., Lee, S. P., Keum, H., D'Angelo, R., Klinker, L., Su, Y., Lu, C., Kim, Y.-S., Ameen, A., Li, Y., Zhang, Y., De Graff, B., Hsu, Y.-Y., Liu, Z., Ruskin, J., Xu, L., **Lu, C.**, Omenetto, F. G., Huang, Y., Mansour, M., Slepian, M. J., Rogers, J. A. *Electronic sensor and actuator webs for large-area complex geometry cardiac mapping and therapy* (**Proceedings of the National Academy of Sciences** **2012**, **IF: 9.67**)

Conference presentation:

- **Material Research Society (oral presentation)** 2016
Flexible fibers for Optoelectronic Probing of Spinal Cord Circuits Boston, MA
- **Society for Neuroscience (poster)** 2016
Flexible fibers for Optoelectronic Probing of Spinal Cord Circuits San Diego, CA
- **Gordon Conference (poster)** 2016
Flexible fibers for Optoelectronic Probing of Spinal Cord Circuits Sunday River, ME
- **Material Research Society (oral presentation)** 2015
Optical Control and Neural Recording in the Spinal Cord In Vivo using Integrated Polymer Waveguides and Carbon Nanoparticle Composites San Francisco, CA
- **MTL Annual Research Conference (oral presentation + poster)** 2015
In Vivo Optical Control of Spinal Cord and Muscle Function with Polymer Fiber Probes Quincy, MA
- **Neurotech (poster)** 2014
Control of Spinal Cord Function with Optoelectronic Polymer Fiber Probes Cambridge, MA
- **Neural Interfaces Conference (oral presentation + poster)** 2014
Control of Spinal Cord Function with Optoelectronic Polymer Fiber Dallas, TX
- **Boston Taiwanese Biotechnology Association (oral presentation + poster)** 2014
All-polymer Neural Probe for Stimulation and Recording in Spinal Cord Cambridge, MA
- **Material Research Society (oral presentation)** 2013
Highly Flexible Polymer Neural Probes for Spinal Cord Stimulation and Recording Boston, MA

Awards and Honors

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| Dow Fellowship (one for each class in Program in Polymers and Soft Matters) | 2012 |
| Dean's list every semester (among the top 20 percent of UIUC College of Engineering) | 2007-2011 |

Leadership and Service

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| The Federation of Taiwanese Student Association in New England, Secretary | 2014-2015 |
| MIT Taiwanese Graduate Student Association (MIT ROCSA), President | 2013-2014 |
| UIUC Taiwanese Student Association, Co-Marketing Director | 2007-2010 |
| The National Society of Collegiate Scholars, Inducted member | 2007-2008 |
| The Honor Society of Phi Kappa Phi, Inducted member | 2007-2008 |