

Lu, Hua PhD

Department of Chemistry, The Scripps Research Institute
10550 N Torrey Pines Rd, SR202, La Jolla, CA, 92037, United States
Phone: 1-858-784-9345; Email: hualu@scripps.edu

Education and Training

- 07/2011 - Postdoctoral fellow, The Scripps Research Institute (TSRI), La Jolla, USA
- 08/2006 – 05/2011 Ph.D., Department of Materials Science and Engineering, University of Illinois at Urbana–Champaign (UIUC), Champaign, USA
- 09/2002 - 07/2006 B.S., College of Chemistry and Molecular Engineering, Peking University, Beijing, China

Research Experiences

- 2011 - Develop various site-specific antibody-conjugates and related technologies for targeted cancer therapy;
mentor: Prof. Peter G. Schultz, TSRI, USA
- 2006 - 2011 Develop synthetic methodology and polypeptides materials for drug delivery and gene delivery applications;
advisor: Prof. Jianjun Cheng, UIUC, USA
- 2005 - 2006 Synthesize novel magnetic metal-organic framework materials;
advisor: Prof. Song Gao, Peking University, Beijing, China
- 2002 - 2005 Synthesize conjugated organic and polymeric materials for the application of organic LED and FETs;
advisor: Prof. Jian Pei, Peking University, Beijing, China

Awards and Honors

- 2013 AkzoNobel Award for Outstanding Graduate Research in Polymer Chemistry, ACS (Only one awardee each year in US and Canada)
- 2012 IUPAC Prize for Young Chemists, Honorable Mention Award
- 2011-2014 Damon-Runyon Cancer Foundation Postdoctoral Fellowship Award
- 2011 Racheff-Intel Award (top winner) for Outstanding Graduate Research, MSE@UIUC
- 2010 Chinese Government Award for Outstanding PHD Students Abroad
- 2010 Excellence in Graduate Polymer Research Symposium, ACS, San Francisco
- 2010-2011 Yee Memorial Fellowship from College of Engineering at UIUC
- 2002-2006 Mingde Fellowship (4 years), Peking University

Publications

- [22] **Hua Lu***, Jing Wang, Ziyuan Song, Lichen Yin, Yanfeng Zhang, Haoyu Tang, Chunlai Tu, Yao Lin* and Jianjun Cheng*, "Recent Advances in *N*-Carboxyanhydrides and Synthetic Polypeptides: Chemistry, Self-assembly and Biological Applications", *Chem. Comm.* **2013**, 49, *Accepted*.
- [21] **Hua Lu**, Danling Wang, Stephanie Kazane, Tsoetne Javahishvili, Feng Tian, Frank Song, Aaron Sellers, Barney Barnett and Peter G. Schultz*, "Site-specific Antibody-polymer Conjugates for siRNA Delivery", *J. Am. Chem. Soc.*, **2013**, 135, 13885–13891
- [20] Yanfeng Zhang, Qian Yin, **Hua Lu**, and Honwgwei Xia, Yao Lin Jianjun Cheng*, "PEG-Polypeptide Dual Brush Block Copolymers: Synthesis and Application in Nanoparticle Surface PEGylation", **2013**, *ACS Macro. Lett.*, 2, 809-813
- [19] Lichen Yin, Haoyu Tang, Kyung Kim, Nan Zheng, Ziyuan Song, Nathan Gabrielson, **Hua Lu**, and Jianjun Cheng*, "Light-Responsive Helical Polypeptides Capable of Reducing Toxicity and Unpacking DNA toward Non-Viral Gene Delivery", **2013**, *Angew. Chemie. Int. Ed.*, 52, 9182-9186
- [18] Jing Wang, Hongwei Xia, Yanfeng Zhang, **Hua Lu**, Ranjan Kamat, Andrey V. Dobrynin, Jianjun Cheng* and Yao Lin*, "Nucleation-Controlled Polymerization of Nanoparticles into Supramolecular Structures", *J. Am. Chem. Soc.*, **2013**, 135, 11417-11420.
- Featured as the cover art of Volume 135, Issue 31, August 7, 2013*
- [17] Jonathan Yen, Yanfeng Zhang, Nathan Gabrielson, Lichen Yin, Linna Guan, Isthier Chaudhury, **Hua Lu**, Fei Wang* and Jianjun Cheng*, "Cationic, helical polypeptide-based gene delivery for IMR-90 fibroblasts and human embryonic stem cell", *Biomater. Sci.*, **2013**, 1, 719-727
- [16] Lichen Yin, Ziyuan Song, Kyung Hoon Kim, Nan Zheng, Haoyu Tang, **Hua Lu**, Nathan Gabrielson, Jianjun Cheng*, "Reconfiguring the architectures of cationic helical polypeptides to control non-viral gene delivery", *Biomaterials*, **2013**, 34, 2340-2349
- [15] Haoyu Tang, Lichen Yin, **Hua Lu**, and Jianjun Cheng*, "Water-Soluble Poly(L-serine)s with Elongated and Charged Side-Chains: Synthesis, Conformations and Cell-Penetrating Properties", *Biomacromolecules*, **2012**, 13, 2609-2615
- [14] Nathan Gabrielson, **Hua Lu**, Lichen Yin, Kyung Hoon Kim and Jianjun Cheng*, "A Cell-Penetrating Helical Polymer for siRNA Delivery to Mammalian Cells", *Mol. Ther.* **2012**, 20, 1599-1609
- [13] Nathan Gabrielson[†], **Hua Lu**[†], Lichen Yin, Dong Li, Fei Wang, and Jianjun Cheng*, "A Reactive Cationic α -Helical Polypeptide Template for Non-Viral Gene Delivery", *Angew. Chem. Int. Ed.* **2012**, 51, 1143-1147 ([†]equal contribution)
- highlighted by *Chemical and Engineering News*, issue of Dec. 19, 2011;
- reported by *ScienceDaily*, *PhysOrg*, and *EurekAlert!* etc.
- [12] Kuan-Ju Chen, Li Tang, Mitch Andre Garcia, Hao Wang, **Hua Lu**, Wei-Yu Lin, Shuang Hou, Qian Yin, Clifton K.-F. Shen, Jianjun Cheng* and Hsian-Rong Tseng*, "The therapeutic efficacy of camptothecin-encapsulated supramolecular nanoparticles", *Biomaterials*, **2012**, 33, 1162-1169
- [11] **Hua Lu**, Jing Wang, Yugang Bai, Jason Long, Shiyong Liu, Yao Lin* and Jianjun Cheng*, "Ionic Polypeptides with Unusual Helical Stability", *Nature Communications*, **2011**, 2, 206.

reported by NSF, ScienceDaily, PhysOrg, EurekAlert! and ChemistryViews etc.

- [10] Jing Wang, **Hua Lu**, Ranjan Kamat , Sai Venkatesh Pingali , Volker S. Urban, Jianjun Cheng* and Yao Lin*, "Supramolecular Polymerization from Polypeptide-Grafted Comb Polymers", *J. Am. Chem. Soc.* **2011**, 133, 12906-12909.

Highlighted by Chemical and Engineering News, issue of Aug. 15, 2011.

- [9] Jing Wang, **Hua Lu**, Yuan Ren, Yanfeng Zhang, Martha Morton, Jianjun Cheng* and Yao Lin*, "Interrupted Helical Structure of Grafted-Polypeptides in Brush-like Macromolecules", *Macromolecules*, **2011**, 44, 8699-9709
- [8] **Hua Lu**, Yugang Bai, Jing Wang, Yao Lin and Jianjun Cheng*, "Controlled Ring-Opening Polymerization of γ -(4-Vinylbenzyl)-L-Glutamate N-Carboxyanhydride for the Synthesis of Functional Polypeptides", *Macromolecules*, **2011**, 44, 6237-6240;

Featured as the cover art of Macromolecules, Volume 44, Issue16, August 23, 2011

- [7] Yanfeng Zhang, **Hua Lu**, Yao Lin and Jianjun Cheng*, "Water-Soluble Polypeptides with Elongated, Charged Side Chains Adopt Ultrastable Helical Conformations", *Macromolecules*, **2011**, 44, 6641-6644
- [6] Yugang Bai, **Hua Lu**, Ettigounder Ponnusamy, and Jianjun Cheng*, "Synthesis of Hybrid Block Copolymers via Integrated Ring-Opening Metathesis Polymerization and Polymerization of NCA ", *Chem. Comm.* **2011**, 47, 10830-10832.
- [5] **Hua Lu**, Jing Wang, Yao Lin* and Jianjun Cheng*, "One-Pot Synthesis of Brush-Like Polymers via Integrated Ring-Opening Metathesis Polymerization and Polymerization of Amino Acid N-Carboxyanhydrides", *J. Am. Chem. Soc.* **2009**, 131, 13582-13583.

Highlighted by Chemical and Engineering News, issue of Sept. 14, 2009.

- [4] **Hua Lu** and Jianjun Cheng*, "N-Trimethylsilyl amines for controlled ring-opening polymerization of amino acid N-carboxyanhydrides and facile end group functionalization of polypeptides", *J. Am. Chem. Soc.* **2008**, 130, 12562-12563
- [3] **Hua Lu** and Jianjun Cheng*, "Hexamethyldisilazane-Mediated Controlled Polymerization of alpha-Amino Acid N-Carboxyanhydrides", *J. Am. Chem. Soc.* **2007**, 129, 14115-14116
- [2] Xiaoyu Cao, Hong Zi, Wei Zhang, **Hua Lu**, and Jian Pei*, "Star-shaped and Linear Nanosized Molecules Functionalized with Hexa-peri-hexabenzocoronene: Synthesis and Optical Properties" *J. Org. Chem.* **2005**, 70, 3645-3653
- [1] Xiaoyu Cao, Wenbin Zhang, Jinliang Wang, Xinhua Zhou, **Hua Lu**, and Jian Pei*, "Extended π -Conjugated Dendrimers Based on Truxene" *J. Am. Chem. Soc.* **2003**, 125, 12430-12431

Publications Submitted or In Preparation

- [1] **Hua Lu**, Quan Zhou, Vishal Deshmukh, Chanhyuk Kim and Peter G. Schultz*, "Bispecific Antibody Conjugates as Potent Immunotherapy Agents for *ex vivo* and *in vivo* AML Treatment " *In preparation.*

Patents

[1] Jianjun Cheng and **Hua Lu**, "Stable Helical Ionic Polypeptides", US 61/418,269, WO PCT/US2011/062656, 2011. (TF10060)

Grants

2011-2014 **Hua Lu** and Peter G. Schultz, Damon-Runyon Cancer Foundation Postdoctoral Fellowship, "Homogeneous Antibody Conjugates Containing Unnatural Amino Acid for Targeted AML therapy" (DRG2099-11)

Conferences, Posters and Presentations

Sept. 2013 Oral presentation, 2013 Damon-Runyon Fellow Retreat, Bervely, MA, USA.
Sept. 2013 Invited oral presentation, 246th ACS National Meeting, Indianapolis, IN, USA
June. 2013 Invited Poster, AkzoNobel North America Innovation Conference.
Dec. 2012 Oral Presentation at the Department of Polymer Science and Engineering, Peking University, Beijing, China
June. 2012 Poster, Gordon Research Conference (GRC), Davidson, NC, USA.
Dec. 2011 Poster, the 11th US-Japan Symposium on Drug Delivery Systems, Maui, HI, USA
Sept. 2011 Poster, 2011 Damon-Runyon Fellow Retreat, San Jose, CA, USA.
May 2011 Oral presentation for Racheff-Intel Award, MSE@UIUC
Jan. 2011 Invited oral presentation for Macromolecular Materials Gordon Research Seminar (GRS) and Poster for Gordon Research Conference (GRC), Ventura, CA, USA
Sept. 2010 Invited oral presentations in China: Institute of Chemistry, Chinese Academy of Sciences, Beijing; University of Science and Technology of China, Hefei; Shanghai Jiao Tong University, Shanghai; Soochow University, Suzhou and Shanghai University, Shanghai.
March 2010 Selected oral presentation in *Excellence in Graduate Polymer Research Symposium*, ACS National Meeting, San Francisco, CA, USA
Aug. 2009 Oral presentation, ACS National Meeting, Washington, D.C. USA
Aug. 2007 Poster, ACS National Meeting, Boston, MA, USA

Teaching, Service and Other Professional Activities

Since 2011 Reviewer for Journals:

Adv. Mater., *Macromolecules*, *ACS Macro Lett.*, *Biomacromolecules*,
Polym. Chem., *Adv. Healthcare Mater.*, *Polymer*, *Macro. Rapid Commun.*,
Biomaterials Sci., *Org. Biomol. Chem.*, *Adv. Funct. Mater.*,
J. Polym. Sci. Part A: Polym. Chem., *Int. J. Nanomedicine*, *Macro. Chem. Phys.*

- 2013 Mentor of junior graduate students in Prof. Schultz's lab
- Jun 2011 Colloquium between Outstanding Students Abroad and Chinese Academy of Science. Beijing, China
- 2011 Lecture entitled "*Controlled Polymerizations for the Preparation of Biomaterials*" for Prof. Cheng's course MSE474
- Aug. 2009 Session Presider for Symposium "Nanoscience in Polymer Chemistry", Division of Polymer Chemistry, ACS National Meeting, Washington, D.C. USA
- 2009 Grader of course MSE470 "*Design and Use of Biomaterials*"
- 2009-2011 Lab demonstration and grader for course MSE474 "*Biomaterials and Nanomedicine*"
- 2007-2010 Mentor of three undergraduate and junior graduate students in Prof. Cheng's lab
- July 2007 Lab demonstration for UIUC's Discover Engineering program