

Lorraine Hsu
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Case Western University
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Department of Macromolecular Science and Engineering
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Education **Case Western Reserve University**, Cleveland, OH
Post Doctoral Research Associate, 2/2009 – present

Northwestern University, Evanston, IL GPA: 3.70
Ph.D. in Organic Chemistry, 9/2003 – 1/2009

Carnegie Mellon University, Pittsburgh, IL Major QPA: 3.71
B.S. in Chemistry with Honors, 8/1999 – 5/2003

Awards

NU-MRSEC Fellowship	2005 – 2008
Allen S. Hussey Award for Teaching	2005
American Institute of Chemists Foundation Award	2003
ACS Analytical Chemistry Division Award	2002
Beckman Fellow	2001 – 2002
CMU Goldwater Nominee	2001

Research **Case Western Reserve University** – Cleveland, IL 2/2009 – present
Experience **Advisor: Profs. Chris Weder and Stuart Rowan**

Northwestern University – Evanston, IL 12/2003 – 1/2009
Advisor: Prof. Samuel I. Stupp
Thesis: Covalently Linking Self-Assembled Peptide Amphiphiles: Designing
Bionanostructures as Instructional Matrices for Regenerative Medicine

Designed and synthesized self-assembling small organic and peptidic molecules with covalent-linking functional groups.
Characterized novel molecules and self-assembled gel systems by spectroscopy, spectrometry, NMR, rheology, and microscopy.
Elucidated the structure of supramolecular nanofibers using molecular probes.
Worked in collaborations on further mechanical testing of gels as well as applying the gels as bioactive scaffolds for *in vivo* and *in vitro* cell growth/differentiation experiments.

Northwestern University – Evanston, IL 7/2003 – 9/2003
Advisor: Prof. Frederick D. Lewis

Chemically ligated DNA hairpins to study DNA folding, using spectroscopy and gel electrophoresis.

Experience Continued **Carnegie Mellon University** - Pittsburgh, PA 1/2000 – 6/2003
Advisor: Prof. Bruce A. Armitage
Honors Thesis: Ionic Strength Dependence of PNA Invasion into Structured DNA Targets

Characterized aggregation and binding modes of various cyanine dyes on DNA templates using spectroscopic methods.
Designed different oligonucleotide systems to regulate aptamer binding to thrombin using PNA (peptide nucleic acid)/DNA recognition.
Developed thermoreversible gels using oligonucleotide hybridization.

Teaching/Leadership Experience Lab manager in the Stupp laboratory 1/2006 – 4/2008
Mentor for RET and REU students 2005 – 2006, 6/2008 – 8/2008
Organic chemistry tutor 1/2003 - 5/2003, 7/2006 – 9/2006
Teaching assistant for undergraduate organic course 9/2003 – 12/2004
Mentor for an undergraduate researcher 9/2002 – 12/2002
Supplementary organic chemistry instructor 8/2002 – 12/2002

Publications **Hsu, L.**; Cvetanovich, G.; Stupp, S. I. "Peptide Amphiphile Nanofibers with Conjugated Polydiacetylene Backbones in their Core." *Journal of the American Chemical Society* **2008**, *130*, 3892-3899.

Hsu, L.; Stupp, S. I., New self-assembling peptide amphiphile, used as scaffolds for tissue growth or drug delivery. U.S. Patent 2008175883-A1, July 24, **2008**.

Stone, D. A.; **Hsu, L.**; Stupp, S. I. "Self-Assembling Quinquethiophene-Oligopeptide Hydrogelators." *Soft Matter* **2009**, *in press*.

Mata, A.; **Hsu, L.**; Capito, R.; Aparicio, C.; Henrikson, K.; Stupp, S. I. "Micropatterning of bioactive self-assembling gels." *Soft Matter* **2009**, *5*, 1228-1236.

Guler, M. O.; **Hsu, L.**; Soukasene, S.; Harrington, D. A.; Hulvat, J. F.; Stupp, S. I. "Presentation of RGDS Epitopes on Self-Assembled Nanofibers of Branched Peptide Amphiphiles." *Biomacromolecules* **2006**, *7*, 1855-1863.

Cao, R.; Zhenyu, G.; **Hsu, L.**; Patterson, G. D.; Armitage, B. A. "Synthesis and characterization of thermoreversible biopolymer microgels based on hydrogen bonded nucleobase pairing." *Journal of the American Chemical Society* **2003**, *125*, 10250-6.

Conferences 235th National ACS Conference, "Peptide Amphiphile Nanofibers with Conjugated Polydiacetylenes in their Core," Speaker, 4/2008, New Orleans, LA.

Beckman Scholars Symposium, "PNA Regulation of Aptamer Binding to Thrombin," Speaker, 8/2002, Irvine, CA.

224th National ACS Conference, “Thermal Regulation of Aptamer Binding to Thrombin,” Poster, 8/2002, Boston, MA.

Professional American Chemical Society

Memberships Phi Lambda Upsilon

References Available upon request.