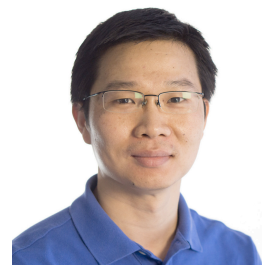


CURRICULUM VITAE

Wei Li

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Department of Chemical Engineering
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RESEARCH AREA

- Cell microenvironments, soft materials
- Biofunctional polymer surface for cell capture and release
- High-throughput layer-by-layer (LbL) systems for biological applications
- Biomedical microdevices

EDUCATION

- **Doctor of Philosophy** 2005–2010
Department of Chemistry, University of Toronto, Canada
- **Master of Applied Science** 2003-2005
Department of Chemical Engineering, University of Toronto, Canada
- **Master of Science** 1999-2002
Department of Chemistry, Wuhan University, China
- **Bachelor of Science** 1995-1999
Department of Chemistry, Wuhan University, China

RESEARCH EXPERIENCE

NSERC Postdoctoral Research Fellow, Chemical Engineering, MIT (Nov. 2010-Oct. 2013)

Advisor: Prof. Paula Hammond (Associate Editor of ACS Nano)

- Developed a microbead-based 3D cell culture platform to create *ex vivo* microenvironment for the enhancement of survival and function of pancreatic beta cells
- Developed a multilayer film for the capture and noninvasive release of circulating tumor cells (CTCs) from whole blood using microfluidic devices
- Invented a capillary flow layer-by-layer (LbL) assembly system for use as a high-throughput approach to create LbL films for siRNA (or growth factor, protein drug) delivery.

Postdoctoral Research Assistant, Chemistry, University of Toronto (April 2010-Oct. 2010)

Advisor: Prof. Eugenia Kumacheva, and Prof. Douglas Stephen

- Developed a microfluidic platform for the study of kinetics of fast gas-liquid reactions

Research Assistant, Chemistry, University of Toronto (2005 – 2010)

- Continuous microfluidic synthesis of polymer particles (microgels, porous microbeads, magnetic microparticles)
- Droplet microfluidics for studying multi-step polymerization reactions and complex reaction processes
- Development of a parallel modular microfluidic reactors for scaled-up synthesis of polymer microparticles
- Surface modification via photopolymerization to change the surface properties of microfluidic devices
- Hands-on experience in soft lithography and hot embossing techniques
- Development of new materials for fabrication of microfluidic reactors
- Suspension polymerization of polymer microparticles
- Experience in analytical (characterization) techniques: FT-IR, NMR, UV-Vis, GPC, DSA, DSC, TGA, SEM, TEM, Laser Confocal Microscopy
- Supervision of undergraduate students

Research Assistant, Chemical Engineering, University of Toronto (2003-2005)

- Development of a magnetic microsphere-based microfluidic valve and mixer
- Flow control in microfluidic reactors

Research Assistant, Chemistry, Wuhan University (1999 – 2002)

- Preparation of fast-responsive hydrogels for controlled release of proteins
- Synthesis and purification of small molecules, such as N-isopropylacrylamide

TEACHING EXPERIENCE

- **Co- instructor**, Jan 2012-May 2012, 2.674 Micro/nano engineering lab, Dept. of Mechanical Engineering, MIT
- **Supervisor of three undergraduate research students**, July 2011 to present, Dept. of Chemical Engineering, MIT
- **Supervisor of two undergraduate research students**, 2007-2010, Dept. of Chemistry, University of Toronto
- **Teaching assistant**, 2005-2009, Organic Chemistry, Polymer Chemistry, Physical Chemistry. Dept. of Chemistry, University of Toronto
- **Teaching assistant**, 2003-2005, Introductory Chemical Engineering, Thermodynamics, Dept. of Chemical Engineering, University of Toronto

PUBLICATIONS

h-index 11with citation of 853 by October 2013

Publications in Refereed Journals

- **W. Li**, S. Lee, M. Ma, S.M. Kim, P. Guye, J.R. Pancoast, D. G. Anderson, R. Weiss, R. T. Lee, P. T. Hammond. Microbead-based biomimetic synthetic neighbors enhance survival and function of rat pancreatic β -cells. *Scientific Reports*, **2013**, 3, 2863. (doi:10.1038/srep02863).
- **W. Li**, K. Liu, R. Simms, J. Greener, S. Pinto, A. Guenther, E. Kumacheva, A Microfluidic Study of fast gas-liquid reactions. *J. Am. Chem. Soc.* **2012**, 134, 3127-3132.
- D. Voicu, C. Scholl, **W. Li**, D. Jagadeesan, I. Nazimova, J. Greener, E. Kumacheva, Kinetics of Multicomponent Polymerization Reaction Studied in a Microfluidic Format. *Macromolecules* **2012**, 45, 4469–4475.

- K. Liu, Z. Nie, N. Zhao, **W. Li**, M. Rubinstein, E. Kumacheva, E. Step-Growth Polymerization of Inorganic Nanoparticles. *Science* **2010**, *329*, 197-200.
- **W. Li**, J. Greener, J. Ren, V. Pakharenko, D. Voicu, T. Tang, E. Kumacheva, Rapid, Cost-efficient Fabrication of Microfluidic Reactors in Thermoplastic Polymers by Combining Photo-lithography and Hot Embossing. *Lab Chip*, **2010**, *10*, 522-524. (Top 10 accessed article in LOC in Feb 2010)
- **W. Li**, J. Greener, D. Voicu, E. Kumacheva, Multiple Modular Microfluidic (M^3) Reactors for the Synthesis of Polymer Particles. *Lab Chip* **2009**, *9*, 2715-2722. (Front cover)
- **W. Li**, H.H. Pham, Z. Nie, B. MacDonald, A. Güenther, E. Kumacheva, Multi-Step Microfluidic Polymerization Reactions Conducted in Droplets. *J. Am. Chem. Soc.* **2008**, *130*, 9935-9941.
- **W. Li**, E. Young, P. Garstecki, C. A. Simmons, E. Kumacheva, et al. Simultaneous Microfluidic Generation of Droplets with Different Dimensions. *Soft Matter* **2008**, *4*, 258-262.
- **W. Li**, Z. Nie, H. Zhang, E. Kumacheva, et al. Screening of the Effect of Surface Energy of Microchannels on Microfluidic Emulsification. *Langmuir* **2007**, *23*, 8010-8014.
- Z. Nie, **W. Li**, M. Seo, SQ Xu, E. Kumacheva, et al. Janus and Ternary Particles Generated by Microfluidic Synthesis: Design, Synthesis and Self-Assembly. *J. Am. Chem. Soc.* **2006**, *128*, 9408-9412.
- J. Greener, **W. Li**, E. Kumacheva, Reusable, Robust NanoPort Connections to PDMS Chips. Chips & Tips, *Lab Chip*, October, **2008**.
- Z. Nie, J. L. Park, **W. Li**, S. Bon, E. Kumacheva, An "Inside-Out" Microfluidic Approach to Monodisperse Emulsions Stabilized by Solid Particles. *J. Am. Chem. Soc.* **2008**, *130*, 16508-16509.
- Y. Liu, J. Ling, **W. Li**, et al. Effective Synthesis of Carbon-coated Co and Ni Nanocrystallites with Improved Magnetic Properties by AC Arc Discharge under an N_2 Atmosphere, *Nanotechnology* 2004, **15**, 43-47.
- RX. Zhuo, **W. Li**. Preparation and Characterization of Macroporous PNIPAAm Hydrogels for Controlled Release of Proteins. *J. Polym. Sci., A: Polym. Chem. Ed.* 2003, **41**, 152-159.
- GP. Yan, RX. Zhuo, CY. Zheng, W. Cao, **W. Li**, L. Li, ML. Liu, YX. Zhang. Synthesis and Preliminary Evaluation of Gadolinium Complexes Containing Sulfonamide Groups as Potential MRI Contrast Agents. *Radiography*, 2003, **9**, 35-41.

Oral Presentations and Posters

- **W. Li**, E. Reategui, M-H. Park, S. Castleberry, J. Z. Deng, B. Hsu, S. Mayner, A. Jensen, S. L. Stott, M. Toner, P. T. Hammond. Enzymatically degradable nano-films for capture and release of circulating tumor cells. *BMES 2013, Seattle*.
- **W. Li**, S. Castleberry, P. Hammond. Automated Capillary flow layer-by-layer assembly of polyelectrolytes. *AIChE 2012 Annual, Pittsburgh*.
- **W. Li**, S. Lee, S. M. Kim, R. T. Lee, P. Hammond. Microbeads-based *ex vivo* 3D microenvironment enhances survival and function of pancreatic β -cell stability. *BMES 2012, Atlanta*.
- **W. Li**, S. Lee, S. M. Kim, R. T. Lee, P. Hammond. Engineering *in vivo* like 3D microenvironment for studying pancreatic β cell stability and communication. *MRS 2011 Fall meeting, Boston*.
- **W. Li**, J. Greener, D. Voicu, E. Kumacheva Modular multiple microfluidic (M^3) reactors for the synthesis of polymer particles. *AIChE 2009 Spring, Tampa*
- J. Greener, **W. Li**, E. Kumacheva, New materials and techniques for producing robust, high-fidelity, high-throughput microfluidic droplet generators. *AIChE 2009 Spring, Tampa*
- **W. Li**, Z. Nie, P. Garstecki, E. Kumacheva, Parallel Multiple Droplet Generators. *AIChE 2007 Spring, Houston*

- E. Kumacheva, **W. Li**, H. Pham, S. Dubinski. Consecutive Polymerization Reactions Conducted in Continuous Microfluidic Reactors. *AIChE 2007 Spring, Houston*
- RX. Zhuo, **W. Li**. Preparation and characterization of macroporous PNIPAAm hydrogels by using PEG as pore-forming agent. *IUPAC world polymer congress 2002*, 9E-6P-01, 891.

Patents

- **W. Li**, S. Castleberry, P. Hammond. Biodegradable LbL films for cell capture and release. (in process, MIT Technology disclosure No. 15894)
We developed a method to capture and noninvasively release circulating tumor cells (CTCs) from whole blood by using the microfluidic devices (collaboration with Prof. M. Toner's lab at MGH). The strategy was to build on sacrificial LbL films that can be modified with EpCam to capture CTCs and can be enzymatically degraded to release cells. Our devices achieved over 80% capture efficacy as well as over 99% recovery of captured CTCs.
- **W. Li**, S. Castleberry, P. Hammond. Capillary flow layer-by-layer assembly of polyelectrolytes. (MIT Technology disclosure No. 15867, provisional 61/719,068, filed in Oct. 2012)
This system provided the capability to, for the first time, create and investigate LbL films with only nanoliters of material required for single-layer deposition.
- **W. Li**, S. Castleberry, P. Hammond. Automated Capillary flow layer-by-layer systems (MIT Technology disclosure No. 15541, provisional 61/719,093, filed in Oct. 2012)
This system provided the capability to, for the first time, create and investigate LbL films in a high-throughput manner using liquid-handling robots.
- **W. Li**, J. Greener, E. Kumacheva, Photo-resist stamp for hot embossing. (Invention Disclosure No. 10001883, US patent filed on Feb. 3rd, 2010)

Invited Reviewer for Journal Papers

Lab on a Chip, RSC Advances, Chemical Communications, Polymers, Chemical Engineering Journal, Journal of Polymer Science B.

INDUSTRIAL-RELATED PROJECTS

- Photo-resist stamp for hot embossing of microfluidic devices (Sept. 2008 – Present, collaborated with EV Group Inc., Tempe, AZ., Member of NILCom,)
- Microfluidic preparation of monodispersed polymer particles (Feb. 2007- June 2008, collaborated with Rohm & Haas, PA.)

AWARDS

- NSERC Postdoctoral Fellowship (2010)
This two-year fellowship is given by the Natural Science and Engineering Research Council of Canada to graduate students who demonstrate exceptional research abilities.
- Chinese Government Award for Outstanding Students Abroad (2009)
This award is granted across all fields of study in the world and was presented to a total of 309 Chinese students studying abroad this year.
- Ontario Graduate Scholarships in Science and Technology (2008)

- Edwin Walter Warren Graduate Student Awards (2007, 2008)

- Xerox Research Centre of Canada Graduate Award (2007)

This award is given by the Xerox Research Centre of Canada to recognize research excellence in graduate students working in polymer science and engineering.

- Ontario Centers of Excellence Professional Outreach Award (2007)
- Graduate Travel Award, University of Toronto (2009)
- Open Fellowship, University of Toronto (2003-2007)
- First Class “Zhangren Huang” Scholarship, Wuhan University, (1998)
- Student “Renmin” Scholarship, Wuhan University, (1996-1997)

REFERENCES AVAILABLE UPON REQUEST