218 Columbia St. Apt #1
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IRENE CHEN

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EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — **Cambridge, MA**
Candidate for Chemical Engineering Ph.D. (4.5/5.0 GPA) — *Jun 2013*
Minor in Mandarin Chinese

UNIVERSITY OF WISCONSIN-MADISON — **Madison, WI**
B.S. Chemical and Biological Engineering (3.8/4.0 GPA) — *Dec 2006*

RESEARCH EXPERIENCE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY — **Cambridge, MA**
Department of Material Science & Engineering Research Assistant — *Mar 2009-present*

- Synthesized metal coordination complex to be incorporated in thermosensitive polymer gel.
- Synthesized responsive gels using heat- and UV-initiated polymerization through custom photomasks.
- Developed image analysis of color-changing, autonomously pulsating gels.
- Demonstrated new class of smart materials by mechanically triggering a chemical reaction in gels.
- Designed pressure sensor applications using gels which detect compression and communicate with neighboring gels by transmitting oscillating signals.
- Accomplished 2 first author publications with 1 cover article, 2 conference presentations.

UNIVERSITY OF WISCONSIN, MADISON — **Madison, WI**
Department of Chemical & Biological Engineering Undergraduate Researcher — *Sept 2003-Dec 2006*

- Designed chromatography columns containing biological cells as an alternative to traditional resin.
- Provided foundational results for PhD thesis topic centered on protein purification using Saccharomyces cerevisiae, yeast cell surface display.
- Compared elution methods using SDS-Page and Western blotting.
- Achieved Merck Undergraduate Research Scholar Award, 1second author publication.

INDUSTRY EXPERIENCE

GENENTECH, INC. — **S. San Francisco, CA**
Process Development Engineering Co-op — *Jan 2007-Jul 2007*

- Evaluated new technology of antibody crystallization for bulk storage.
- Characterized crystal formation, morphology, and solubility using HPLC.
- Collaborated with Late Stage Pharmaceutical Development to assess product quality of antibodies.
- Implemented scale-up and filtration of antibody crystals.
- Optimized 5 process variables to maximize crystal yield while retaining ideal crystal morphology.
- Improved dissolution protocol for protein crystallization process.

GENENTECH, INC. — **S. San Francisco, CA**
Process Development Engineering Co-op — *Jun 2005-Dec 2005*

- Evaluated methods for detecting resin packing failures in 46-cm pilot plant chromatography column.
- Revised column packing methods for ion-exchange resin.

PROCTER & GAMBLE COMPANY — **Cincinnati, OH**
Formula Design Summer Intern — *May 2004-Aug 2004*

- Reformulation of powder Tide® to increase cost savings.

TEACHING EXPERIENCE

MIT, *Supervisor,* Mentored and trained 2 undergraduate researchers — *Feb 2010-May 2012*
MIT, *Polymers Teacher,* CMSE middle school outreach program — *July 2011*
MIT, *Teaching Assistant,* Introduction to Chemical Engineering Course — *Jan 2009-May 2009*

LEADERSHIP

MIT, *Treasurer,* MIT Snowriders club — *Jan 2011-April 2011*
MIT, *Art officer,* graduate housing Ashdown residence — *May 2009-May 2010*
MIT, *Social committee officer,* graduate housing Ashdown residence — *May 2008-May 2009*

SKILLS

COMPUTER: MATLAB, LaTeX, Microsoft office, Vector Illustration, Photoshop, Image J.
LAB: Polymer and organic synthesis, complex kinetics, "smart" materials, HPLC, FBRM, timelapse and fluorescence microscopy, image analysis, cell culture, yeast display, UV-Vis, SDS-Page, western blotting and silver staining, crystallization, column chromatography, surfactant chemistry, some AFM and nanoindentation.

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PUBLICATIONS

Chen, I.C., Van Vliet, K.J., "Mechanism of mechanically triggered oscillations and subsequent signal transmission in polymer gels," (in preparation, 2012).

Chen, I.C., Kuksenok, O., Yashin, V.V., Balazs, A.C., Van Vliet, K.J., "Mechanical resuscitation of chemical oscillations in Belousov-Zhabotinsky gels," *Adv. Funct. Mater*., 22(12), 2535, 2012.

- Research featured on New Scientist's blog and University of Pittsburgh's online news.

Chen, I.C., Kuksenok, O., Yashin, V.V., Moslin, R.M., Balazs, A.C., Van Vliet, K.J., "Shape- and size-dependent patterns in self-oscillating polymer gels," *Soft Matter*, 7(7), 3141-3146, 2011.

- Front page cover article and research spotlight on MIT home page.

Cho, Y.K., **Chen, I.**, Wei, X., Li, L., Shusta, E.V., "A yeast display immunoprecipitation method for efficient isolation and characterization of antigens," *J. Immunol. Methods* 341(1-2) 117-126, 2009.

CONFERENCE PRESENTATIONS

Chen, I.C., Kuksenok, O., Yashin, V.V., Balazs, A.C., Van Vliet, K.J., "Mechanical resuscitation of BZ oscillations in a gel," Spring MRS 2012, San Francisco (poster).

Chen, I.C., Kuksenok, O., Yashin, V.V., Balazs, A.C., Van Vliet, K.J., "Mechanically induced oscillations in Belousov-Zhabotinsky gels," Spring APS 2012, Boston (talk).

Chen, I.C., Kuksenok, O., Yashin, V.V., Balazs, A.C., Van Vliet, K.J., "Realization of Shape-Governed Pattern Formation in Belousov-Zhabotinsky Self-Oscillating Gels" Fall MRS 2010, Boston (poster).