

Curriculum Vitae: Lingchong You

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EDUCATION

Post-Doctoral Scholar (Biochemistry). Division of Chemistry and Chemical Engineering, Caltech. Pasadena, California, USA. 2002-present

Ph.D. in Chemical Engineering. University of Wisconsin-Madison. Madison, Wisconsin, USA. 2002. Thesis title: *The extension, application, and generalization of a phage T7 intracellular growth model.*

M.S. in Molecular Biology. University of Science and Technology of China (USTC), Hefei, China. 1997.

B.E. in Chemical Engineering (with honors). Chengdu University of Science and Technology (CUST), Chengdu, China. 1994.

RESEARCH INTERESTS

1. Nonlinear dynamics in biology
2. Mechanisms of noise propagation and regulation in gene networks
3. Design and construction of robust gene networks for applications in engineering and medicine

SELECTED AWARDS AND HONORS

1. Invited participant of the **1st National Academies KECK Futures Initiative Conference**, on “*Signaling, Decisions and Meaning in Biology, Physics, and Engineering*”, Nov 14-16, 2003, at Irvine, CA.
2. **Marie Christine Kohler Knapp Fellow.** University of Wisconsin-Madison. 2001–2002.
3. **NIH/NLM (National Library of Medicine) Travel Grant** for the Pacific Symposium on Biocomputing. 2001.
4. **Nomination for Ragatz Award** (Best discussion section TA). Chemical Engineering Department, University of Wisconsin-Madison. 2000.
5. **Vilas Travel Award.** University of Wisconsin-Madison. 1999.
6. **Guanghua Scholarship.** Guanghua Foundation, China. 1995.
7. **Sichuan Province Honor Student.** Sichuan province, China. 1994.
8. **Dow Chemical Scholarship.** Dow Chemical (China). 1993.
9. **Promotion of Chemical Industry Scholarship.** Chinese Ministry of Chemical Industry. 1992.
10. **The 2nd Prize for Mathematical Contest in Modeling.** Chinese Society of Industrial and Applied Mathematics. 1992.
11. **The Top Prize for the Contest in Advanced Mathematics.** CUST. 1991.

12. **The Top Prize for the Contest in Physics.** CUST. 1991.
13. **Huaxing Scholarship.** Huaxing Foundation, China. 1991.
14. **CUST Honor Student.** CUST. 1990 – 1994.

PUBLICATIONS

Peer reviewed articles

1. **You, L.** (2004) Towards computational systems biology. *Cell Biochemistry and Biophysics*. *In press*
2. **You, L., A. Hoonlor, and J. Yin.** (2003) Modeling biological systems using *Dynetica* – a simulator of dynamic networks. *Bioinformatics*. **19**: 435-436.
3. **Srivastava, R., L. You, J. Summers, and J. Yin.** (2002) Stochastic versus deterministic modeling of intracellular viral kinetics. *J. Theor. Biol.* **218**: 309-321.
4. **You, L. and J. Yin** (2002). Dependence of epistasis on environment and mutation severity as revealed by *in silico* mutagenesis of phage T7. *Genetics*. **160**: 1273-1281
5. **You, L., P. F. Suthers, and J. Yin** (2002). Effects of *E. coli* physiology on growth of phage T7 *in vivo* and *in silico*. *J. Bacteriology*. **184**: 1888-1894. (Highlighted in *Editors' Choice of Science* (2002), **296**: 219)
6. **You, L. and J. Yin** (2001). Simulating the growth of viruses. *Proceedings of the Pacific Symposium on Biocomputing*: 532-543.
7. **You, L. and J. Yin** (2000). Patterns of regulation from mRNA and protein time-series *Metabolic Engineering*. **2**: 210-217.
8. **Endy, D., L. You, J. Yin, and I. J. Molineux** (2000). Computation, prediction, and experimental tests of fitness for bacteriophage T7 mutants with permuted genomes. *Proc. Nat. Acad. Sci. USA*. **97**: 5375-5380.
9. **You, L. and J. Yin** (1999). Amplification and spread of viruses in a growing plaque. *J. Theor. Biol.* **200**(4): 365-373.
10. **You, L., Q. Liu, Y. Shi, C. X. Wang, M. Lahaye, and V. Tran** (1997). The conformational study of β -D-GlcA-(1,4)-L-Rha in solution by NMR and molecular dynamics simulations. *Chemical Physics*. **224**: 81-94.

Manuscripts submitted or in preparation

1. **You, L. and J. Yin.** Evolutionary design on a budget: robustness, fragility, and optimality of bacteriophage T7. *Submitted*.
2. **You, L., R. S. Cox III, R. Weiss and F. H. Arnold.** Programming population dynamics by cell-to-cell communication and feedback regulation. *In preparation*.
3. **You, L., R. S. Cox III, and F. H. Arnold.** A synthetic *E. coli* predator-prey ecosystem. *In preparation*.

PRESENTATIONS

1. **You, L. (speaker) and F. H. Arnold (2003).** Design and construction of a synthetic population control circuit. *Advances in Biotechnology Genomics I*. AICHE Annual Meeting (November), San Francisco, CA.

2. **You, L. (speaker), R. S. Cox III, and F. H. Arnold (2003).** Computational design of a synthetic E. coli predator-prey ecosystem. *Advances in Metabolic Engineering and Bioinformatics I*. AIChE Annual Meeting (November), San Francisco, CA.
3. **You, L. and J. Yin (speaker) (2002).** Environmental constraints on genomic design: insights from in silico mutagenesis of virus-host interactions (oral presentation). *Advances in Bioinformatics: Networks and Pathways*. AIChE Annual Meeting (November), Indianapolis, IN.
4. **You, L. (speaker) and J. Yin (2001).** Quantifying genetic interactions using *in silico* mutagenesis (oral presentation). *Food, Pharmaceutical, Bioengineering & Fundamentals in Life Science*. AIChE Annual Meeting (November), Reno, NV.
5. **You, L. (speaker), A. Hoonlor, Y.-F. Chen, and J. Yin (2001).** Modeling biological systems using *Dynetica* – a simulator of dynamic networks. *Bioinformatics and Genomics*, AIChE Annual Meeting (November), Reno, NV.
6. **You, L. (presenter) and J. Yin (2001).** From Genome to Organism: Computing the Dynamics of Phage T7 Growth and Exploring the Interactions Among Deleterious Mutations (poster). Pacific Symposium on Biocomputing (January). The Big Island, Hawaii.
7. **You, L. (speaker), P. Suthers, and J. Yin (2000).** Effects of *E. coli* physiology on bacteriophage T7 growth (oral presentation). *Advances in Bioinformatics*. AIChE Annual Meeting (November), Los Angeles, CA.
8. **Srivastava, R. (presenter), L. You, J. Summers and J. Yin (2000).** Stochastic versus deterministic modeling of hepatitis B virus intracellular kinetics (poster). *Food, Pharmaceutical and Bioengineering*, AIChE Annual Meeting (November), Los Angeles, CA.
9. **You, L., D. Endy, and J. Yin (presenter) (2000).** Functional genomics of bacteriophage T7 (poster). Quantitative Challenges in the Post-Genomic Sequence Era: A Workshop and Symposium (January). San Diego, CA.
10. **You, L. (presenter) and J. Yin (1999).** Discovering patterns of biochemical function from mRNA and protein time-series (poster). AIChE Annual Meeting (November), Dallas, TX.
11. **Endy, D. (speaker), L. You, I. J. Molineux, and J. Yin (1999).** Prediction, design, and characterization of alternative genetic element orders for bacteriophage T7 (oral presentation). ACS National Meeting (March), Anaheim, CA.

SOFTWARE DEVELOPEMENT

- **DYNETICA:** a generic, biologist-friendly software package for constructing, visualizing and analyzing models of biological networks.
- **T7v2.5:** a simulation package of the intracellular growth cycle of bacteriophage T7.

RESEARCH PROJECTS AND EXPERIENCE

Post-doctoral research: Division of Chemistry and Chemical Engineering, Caltech. *Advisor: Prof. Frances H. Arnold.*

- Designing and constructing *de novo* genetic circuits to program population dynamics in one or multiple E. coli populations.

Doctoral research: Department of Chemical Engineering, University of Wisconsin-Madison. 1997 – 2002. *Advisor: Prof. John Yin.*

- Developed *Dynetica*, a generic-purpose tool for building and analyzing computer models of DYNAMIC NETWORKS that widely exist in engineering and biology, such as biochemical and chemical reaction networks, metabolic pathways, signaling pathways, and genetic networks.
- Extended a simulation of the intracellular growth of bacteriophage T7 in *E. coli* to investigate various aspects of phage biology and genome-environment interactions.
- Proposed an algorithm to identify potential protein functions, especially pair-wise protein-protein interactions, based on the time series data of mRNAs and proteins; demonstrated the use of the algorithm by using the simulated data generated from the T7 simulation.
- Explored the intracellular kinetics of hepatitis B virus infection using both deterministic and stochastic approaches.
- Studied the amplification and spread of a phage plaque using a reaction-diffusion model.

TEACHING EXPERIENCE

Teaching Assistant: *Thermodynamics of Mixtures*, University of Wisconsin-Madison. Fall, 2000.

Teaching Assistant: *Biochemical Engineering*, University of Wisconsin-Madison. Spring, 1998.

SUPERVISING EXPERIENCE

Advised three undergraduate students participating in the *Dynetica* project, 2000-2002.

Advised two graduate students and two undergraduate students in the Synthetic Ecosystem project. 2002-2003

OTHER EXPERIENCE

President of UW-Madison Chinese Student and Scholar Association. 1999-2000.