

BIOGRAPHICAL SKETCH

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NAME YOU, Lingchong		POSITION TITLE Assistant Professor	
eRA COMMONS USER NAME LINGCHONG			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE	YEAR	FIELD OF STUDY
Chengdu Univ. of Sci and Tech	B. E.	1994	Chemical Engineering
Univ. of Sci and Tech of China	M. S.	1997	Molecular Biology (Mentor: Yunyu Shi)
University of Wisconsin-Madison	Ph.D.	2002	Chemical Engineering (Mentor: John Yin)
California Institute of Technology	Postdoctoral	2004	Biochemistry (Mentor: Frances H. Arnold)

A. Positions

- 2005-, Assistant Professor. Department of Biomedical Engineering, Duke University.
- 2005-, Assistant Professor. Institute for Genome Sciences & Policy, Duke University.
- 2005-, Assistant Professor. Center for Biomolecular and Tissue Engineering, Duke University.
- 2005-, Assistant Professor. University Program in Genetics and Genomics, Duke University.
- 2002-2004, Postdoctoral Scholar in Biochemistry. California Institute of Technology.

B. Selected Honors and Activities

- National Science Foundation CAREER Award. 2010-2015.
- DuPont Young Professor Award. 2008-2011
- David and Lucile Packard Fellowship. 2006-2011
- Invited speaker. Synthetic Biology Discussion Meeting (Sponsored by the Royal Society). June 2008. London, UK.
- University of Wisconsin Alumnae speaker. Computational and Informatics in Biology and Medicine Program Annual Retreat. Madison, WI, October 2006
- Invited speaker. Life Engineering Symposium (Sponsored by the National Academies). August 2005, SF, CA.
- Marie Christine Kohler Knapp Fellow. University of Wisconsin-Madison. 2001–2002.
- Editorial Board:
Synthetic Biology
Systems and Synthetic Biology

C. Publications***Peer-reviewed publications***

1. H. Song, S. Payne, M. Gray, and **L. You** (2009). Spatiotemporal modulation of biodiversity in a synthetic chemical-mediated ecosystem. **Nature Chemical Biology**. 5(12):929-35
2. Q. Wang, J Niemi, C. Tan, **L. You** and M. West (2009), Image segmentation and dynamic lineage analysis in single-cell fluorescence microscopy. **Cytometry A**. Published online. DOI:10.1002/cyto.a.20812
3. C. Tan, P. Marguet, and **L. You** (2009). Emergent bistability by a growth-modulating positive feedback circuit. **Nature Chemical Biology**. Published online. doi:10.1038/nchembio.218
4. A. Pai, Y. Tanouchi, C. H. Collins, and **L. You** (2009). Engineering multicellular behavior by cell-cell communication. **Current Opinion in Biotechnology**. Published online. doi:10.1016/j.copbio.2009.08.006.

5. A. Pai and L. You (2009). Optimal tuning of bacterial sensing potential. **Molecular Systems Biology**. 5:286.
6. Y. Tanouchi, A. Pai, and L. You (2009). Decoding biological design principles using gene circuits. **Molecular BioSystems**. DOI: 10.1039/b901584c
7. C. Smith, H. Song, and L. You (2008). Signal discrimination by differential regulation of protein stability in quorum sensing. **J. Molecular Biology**. 382:1290-7
8. Y. Tanouchi, D. Tu, J. Kim, and L. You (2008). Noise reduction by diffusional dissipation in a minimal quorum sensing motif. **PLoS Computational Biology**. 4: e1000167.
9. K. Brenner, L. You, and F. H. Arnold (2008). Engineering microbial consortia: a new frontier for synthetic biology. **Trends in Biotechnology**. 26: 483-489
10. F. Balagadde, H. Song, J. Ozaki, C. Collins, M. Barnett, F. H. Arnold, S. Quake, and L. You (2008). A synthetic *Escherichia coli* predator-prey ecosystem. **Molecular Systems Biology**. 4:187. *Faculty of 1000 Biology, Must Read*
11. G. Yao, T. Lee, S. Mori, J. R. Nevins, and L. You (2008). A Bistable Rb-E2F Switch Underlies the Restriction Point. **Nature Cell Biology**, 10: 476-482. *Faculty of 1000 Biology, Must Read*
12. T. Lee, G. Yao, J. R. Nevins, and L. You (2008). Sensing and integration of Erk and PI3K signals by Myc. **PLoS Computational Biology**, 4: e1000013.
13. C. Tan, F. Reza, and L. You (2007). Noise-limited frequency signal transmission in gene circuits. **Biophysical J.** 93:3753-61.
14. C. Tan, H. Song, J. Niemi, and L. You (2007). A synthetic biology challenge: making cells compute. **Molecular BioSystems**. 3: 343-353.
15. P. Marguet, F. Balagadde, C. Tan, and L. You (2007). Biology by design: reduction and synthesis of cellular components and behavior. **J. Royal Society Interface**. 4:607-623. (Cover Article)
16. F. Reza, K. Chandran, M. Feltz, A. Heinz, E. Josephs, P. O'Brien, B. Van Dyke, H. Chung, S. Indurkha, N. Lakhani, J. Lee, S. Lin, N. Tang, T. LaBean, L. You, F. Yuan and J. Tian (2007). Engineering novel synthetic biological systems. **IET Synthetic Biology**. 1:48-52
17. L. You and J. Yin. (2006). Evolutionary design on a budget: robustness and optimality of bacteriophage T7. **IEE. Systems Biology** 153:46-52.
18. F. K. Balagadde *, L. You*, C. Hansen, F. H. Arnold, and S. Quake (2005). Long-term monitoring of bacteria undergoing programmed population control in a microchemostat, **Science**. 309: 137-140. (* contributed equally). *Faculty of 1000 Biology, Recommended.*
19. L. You, R. S. Cox III, R. Weiss, and F. H. Arnold (2004). Programmed population control by cell-cell communication and regulated killing. **Nature** 428: 868-871.
20. L. You (2004). Towards computational systems biology. **Cell Biochemistry and Biophysics**. 40: 167-184.
21. L. You, A. Hoonlor, and J. Yin. (2003). Modeling biological systems using *Dynetica* – a simulator of dynamic networks. **Bioinformatics**. 19: 435-436.
22. R. Srivastava, L. You, J. Summers, and J. Yin (2002). Stochastic versus deterministic modeling of intracellular viral kinetics. **J. Theor. Biol.** 218: 309-321.
23. L. You 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
24. L. You, 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.
25. L. You and J. Yin (2001). Simulating the growth of viruses. **Proc of the Pacific Symposium on Biocomputing**: 532-543.
26. L. You and J. Yin (2000). Patterns of regulation from mRNA and protein time-series **Metabolic Engineering**. 2: 210-217.
27. D. Endy, 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.

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28. L. You and J. Yin (1999). Amplification and spread of viruses in a growing plaque. **J. Theor. Biol.** 200(4): 365-373.
29. L. You, 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.

Book chapters

1. T. Lee, D. Tu, C. M. Tan, and L. You (2007). Modeling cellular networks. In "**Systems Bioinformatics: An Engineering Case-Based Approach**," Eds. G. Alterovitz & M. Ramoni. Chapter 6. Page 151-178. (Peer reviewed)
2. D. Tu, J. Lee, T. Ozdere, T. Lee, and L. You (2007). Engineering gene circuits: foundations and applications. In "**Nanotechnology in Biology and Medicine: Methods, Devices and Applications**," Ed. T. Vo-Dinh. CRC Press. Chapter 20. Page 363-380
3. H. Song, S. Payne, and L. You (2009). Programming population dynamics by engineered cell-cell communication. To appear in "**Microbial Systems Biology**", Ed. Nicholas Bergman, Wiley-Blackwell, 2009.

Perspectives

1. F. J. Isaacs and L. You (2009). A brave new synthetic world. **Genome Biology.** 2009, **10**:302
2. J. V. Wong, H. Song, and L. You (2007). A whole more than the sum of its synthetic parts. **ACS Chemical Biology.** 3: 27-29
3. H. Song, C. Tan, and L. You (2007). Living computers. **Chemical Biology.** Published online. March 2007
4. H. Song and L. You (2006). Evolving sensitivity. **ACS Chemical Biology.** 1:681-682

Ph.D. Thesis

The extension, application, and generalization of a phage T7 intracellular growth model. Department of Chemical Engineering. University of Wisconsin-Madison, WI. May 2002. (Advisor: John Yin)

Manuscripts submitted

1. J. V. Wong, G. Yao, J. Nevins, and **L. You** (2010). Using noisy gene expression to probe signaling dynamics in mammalian cells. (*Under review at Molecular Cell*)
2. T. Lee, G. Yao, D. Bennet, J. Nevins, and **L. You** (2010). Transition probability and stochastic dynamics of the bistable Rb-E2F switch. (*Revision under review PLoS Biology*)
3. G. Yao, C. Tan, S. Mori, J. Nevins, and **L. You** (2010). Origin of reversible bistability in mammalian cell cycle entry. (*Under review at Molecular Systems Biology*)
4. P. Marguet, Y. Tanouchi, E. Spitz, C. Smith, and **L. You** (2010). Oscillations in population dynamics reveal hidden facets of host-circuit interactions. (*Under review at PLoS ONE*)

D. Synergistic Activities

Committees

1. Member, Duke Pratt School Energy Initiative Committee (Education), 2009-present
2. Member, Duke Pratt School Risk and Uncertainty Faculty Search Committee, 2009-present
3. Chair, Duke BME Curriculum Committee, 2009-present
4. Member, Duke BME Curriculum Committee, 2008-present
5. Member, Duke Computational Biology and Bioinformatics Graduate Admission Committee, 2007-2008
6. Member, Duke Center for Systems Biology Steering Committee, 2008-present

Conferences

7. Co-chair, Synthetic Systems Biology, AIChE Annual Meeting, 2010
8. Co-chair, Synthetic Systems Biology of Interacting Microbes, AIChE Annual Meeting, 2010
9. Invited participant: Synthetic Biology Workshop organized by NCI/NIGMS, 2010.
10. Invited participant: NAKFI Synthetic Biology meeting sponsored by National Academies and KECK Futures Initiative, 2009.
11. Co-chair, Synthetic Systems Biology, AIChE Annual meeting, 2008 & 2009
12. Co-chair, Engineering and modeling cellular networks, BMES Annual meeting, 2008.
13. Session chair. NSF workshop on *Molecular Communication: Biological Communications*. February 2008.
14. Co-chair. *Mathematical approaches to systems biology*. AIChE Annual meeting. November 2007. Co-chair. *Synthetic Biology*. BMES Annual meeting. 2007. Los Angeles, CA
15. Co-chair. *Cellular systems biology and bioengineering*. BMES Annual meeting. 2006,
16. Co-organizer and speaker. The 1st Duke Systems Biology Symposium. 2006
17. Co-organizer. *Dynamics of Gene Networks Workshop*. The 20th IUBMB International Congress of Biochemistry and Molecular Biology. 2006, Kyoto. Japan.
18. Invited participant: DARPA-organized "Synthetic Biology Workshop", May 2003, Pasadena, CA

Reviewers and Panel Members (since 2004)

19. Journals

Science, Nature, Nature Biotechnology, Nature Chemical Biology, PLoS Biology, PNAS, Molecular Systems Biology, PLoS Computational Biology, Biophysical J., Molecular BioSystems, J. Bacteriology, JACS, Protein Science, FEBS Letters, Biotech. Bioeng., Biotech Prog., Bulletin of Mathematical Biology, J. Royal Society Interface, Physical Biology, J. Bio Engr, Physical Review E., Journal of Theoretical Biology, Expert Opinion on Drug Discovery, Drug Discovery Today, Theoretical Biology and Medical Modelling, BMC Systems Biology, Systems and Synthetic Biology, Integrative Biology

20. Funding agencies

- National Science Foundation (CBET, EMI, Genes and Genome Systems) 2006-
- Center for Scientific Reviews (EUREKA, Systems Approach to Salivary Gland Biology Special Panel, Director's New Investigator Awards Special Panel), National Institutes of Health 2007-
- The Center for Nanophase Materials Sciences. The Oak Ridge National Laboratory, TN, 2005-

21. Others

- President of UW-Madison Chinese Student and Scholar Association. 1999-2000.
- NIH/NLM (National Library of Medicine) Travel Grant for the Pacific Symposium on Biocomputing. 2001.
- Vilas Travel Award. University of Wisconsin-Madison. 1999.
- Guanghua Scholarship. Guanghua Foundation, China. 1995.
- Sichuan Province Honor Student. Sichuan province, China. 1994.
- Dow Chemical Scholarship. Dow Chemical (China). 1993.
- Promotion of Chemical Industry Scholarship. Chinese Ministry of Chemical Industry. 1992.
- The 2nd Prize for Mathematical Contest in Modeling. Chinese Society of Industrial and Applied Mathematics. 1992.
- The Top Prize for the Contest in Advanced Mathematics. CUST. 1991.
- The Top Prize for the Contest in Physics. CUST. 1991.
- Huaxing Scholarship. Huaxing Foundation, China. 1991.
- CUST Honor Student. CUST. 1990 – 1994.

E. Teaching Experience

Instructor:

- BME265: *Modeling and engineering gene circuits*, Duke University, Spring 2005; Fall 2006
- BME100L: *Modeling cellular and molecular systems*. Duke University, Spring 2006; Spring 2007; Spring 2008

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

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

F. Supervising Experience

- Advised three undergraduate students (UW-Madison), 2000-2002.
- Advised two graduate students, two undergraduate students, a technician (Caltech). 2002-2004
- Advised one postdoctoral scholar (Jun Ozaki), one Masters Thesis student (Dennis Tu), five rotation students (Alan Boyle, Xianrui Cheng, Terry Jackson, Taylan Ozdere, and Faisal Reza), nine undergraduate student (Bruno Gugelmin, Jiwon Lee, Austen Heinz, Serge Reshetnikov, Peter Blais, Chris Rowland, Maher Salah, Eric Spitz, Xin Zhang), and two high school students (Yan Yan & Christina Jozefiak) (Duke). 2004-2007.
- Advising 2 postdoctoral scholars (Hao Song and Jeff Wong), five graduate students (Tae Jun Lee, Anand Pai, Philippe Marguet, Chee Meng Tan, and Yu Tanouchi), and five undergraduate students (Stephen DeVience, Meagan Gray, Yingte Huang, Cameron Smith, and David Wang)
- Committee member for:
 1. Xianrui Cheng – Computational Biology and Bioinformatics PhD candidate (Advisors: Dave McClay & Josh Socolar) 2008.
 2. Jarad Niemi – Statistics PhD candidate (Advisor: Mike West). 2007.
 3. Marshall Thompson – UPGG PhD candidate (Advisor: Jack Keene). 2008
 4. Tao Xu – Electric Engineering PhD candidate (Advisor: Krishnendu Chakrabarty). 2007
- Co-advised a team of Duke undergraduate students and high school students in participating MIT-organized annual IGEM competition in synthetic biology. Two high-school advisees won 3rd prize in the National Siemens Competition in Science and Math.

G. Software

- **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.

H. Invited Talks

1. TBD. International Conference On Synthetic Biology. University of Evry-Val-d'Essonne, Evry, France, December 2010.
2. *Modeling and measuring cell cycle regulation*. Computational Cell Biology Summer Course. Cold Spring Harbor Laboratories, July 2010.
3. *Biology by design: reduction and synthesis of cellular networks*. "Young Innovator" Seminar Series, Biomedical Engineering, Georgia Institute of Technology, Atlanta, Georgia, March 2010.
4. *Biology by design: reduction and synthesis of cellular networks*. Workshop on Synthetic Biology, Mathematical Biosciences Institute, Ohio State University, February 2010
5. *Biology by design: reduction and synthesis of cellular networks*. North Carolina State University. Raleigh, North Carolina, January 2010
6. *Engineering population dynamics by cell-cell communication*. University of Illinois at Urbana-Champaign, Illinois, October 2009.
7. *Engineering population dynamics by cell-cell communication*. The 10th International Conference on Systems Biology. Stanford University. California, August 2009.

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8. *Biology by design: reduction and synthesis of cellular networks*. The International Conference on Cellular Information Processing. Peking University. Beijing, China. July 2009.
9. *Synthetic predation in a dish*. Frontiers in Synthetic Biology Symposium. Harvard Medical School. Dec 2008
10. *Biology by design: reduction and synthesis of cellular networks*. Los Alamos National Laboratory. New Mexico. Oct 2008
11. *A tale of two circuits: what I create, I may not understand*. Workshop on Characterizing Landscapes: From Biomolecules to Cellular Networks. Telluride. Colorado. July 2008
12. *A tale of two circuits: what I create, I may not understand*. Royal Society Discussion Meeting on Synthetic Biology. London, June 2008
13. *Programming bacterial dynamics using engineered communication*, DuPont, Feb 2008
14. *Engineering biological uncertainty*, NSF workshop on Molecular Communications, Feb 2008
15. *Modeling, measuring and mimicking the mammalian cell cycle entry*. National Cancer Institute, Jan 2008
16. *Modeling, measuring and mimicking the mammalian cell cycle entry*. University of Virginia. November 2007.
17. *Regulation of the mammalian cell cycle entry by a bistable Rb/E2F pathway*. Workshop on "Mathematical Systems Biology of Cancer", Mathematical Sciences Research Institute. October 2007.
18. *Modeling, measuring and mimicking the mammalian cell cycle entry*. University of North Carolina at Chapel Hill. September 2007.
19. *Sensing and communication in natural and engineered bacteria*. Packard annual meeting. Monterey, CA. September 2007
20. *Sensing and communication in natural and engineered bacteria*. Workshop on Systems Biology of Microbes. Computational and Systems Biology Symposium 2007. San Diego. August 2007
21. *Engineering synthetic killer circuits in bacteria*. Synthetic Biology Workshop*. The 44th Design Automation Conference. San Diego. June 2007.
22. *Engineering synthetic killer circuits in bacteria*. Computational Cell Biology Workshop. Cold Spring Harbor Laboratory. March 2007
23. *Fidelity and speed of signal transmission limited by noise*. Biology-Inspired Modeling, IBE Annual Meeting. March 2007
24. *Modeling, measuring, and mimicking a bistable Myc/Rb/E2F circuit*. NCI Workshop on "The Science of Cancer Modeling", Bethesda, MD, December 2006
25. *Biology by design: reduction and synthesis of cellular networks*, Computation and Informatics in Biology and Medicine Program Annual Retreat. (UW-Madison Alumnae speaker), Madison, WI, October 2006
26. *Programming bacterial dynamics by synthetic killer circuits*. The First Duke Systems Biology Symposium, Durham, NC, September 2006.
27. *Modeling complex dynamic cellular networks*. SAMSI workshop on "Development, Assessment, and Utilization of Complex Computer Models", Durham, NC, September 2006
28. *Control of the mammalian cell cycle entry by a bistable switch*. Workshop on "Exploring the Mechanisms and Landscapes of Cellular Networks". Telluride Science Research Center, CO, August 2006.
29. *Control of the mammalian cell cycle entry by a bistable switch*. SIAM Life Sciences Symposium. Raleigh, NC. August 2006.
30. *Programming bacterial dynamics by synthetic killer circuits*. American Physical Society Annual Meeting. Baltimore, MD. March 2006.
31. *Synthetic Biology: Rewiring a bug's life*. Center for Nonlinear and Complex Systems seminar series. Duke University, NC. November 2005.

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32. *Designer cells: "what I cannot create, I do not understand"*. IGSP Computation Biology and Bioinformatics seminar series. Duke University. September 2005.
33. *Biology by design: reduction and synthesis of cellular networks*. IGSP Genomes@4 seminar series, Duke University. NC. March 2005.
34. *Synthetic gene circuits for decoding life*. UPGG/IGSP seminar series. Duke University, NC February 2005.
35. *Homeostasis, oscillations, and ecological interactions in reprogrammed bacterial populations*. Workshop on Regulatory Networks. Mathematical Biosciences Institute, The Ohio State University, Columbus, Ohio. November 2004
36. *Synthetic gene circuits for decoding and controlling cellular behavior*. Duke Bioengineering Initiative Forum. Duke University, Durham, NC. October, 2004
37. *Beyond single cells: programming population dynamics by cell-cell communication*. Computational Bioengineering -- Synthetic Cell Communication Systems. BMES Annual Meeting.. Philadelphia, PA. October, 2004.
38. *Homeostasis, oscillations, and ecological interactions in reprogrammed bacterial populations*. Center for Biological Circuit Design. California Institute of Technology, CA. October, 2004.
39. *Integrated understanding of biological networks by modeling*. Integrating Disparate Data to Simulate Lymphocyte Function. The Banbury Center, Cold Spring Harbor Laboratory, NY. September, 2004.
40. *Beyond single cells: Programming population dynamics by engineered cell-cell communication*. SIAM Life Sciences Symposium. Portland, OR. July 2004.
41. *Beyond single cells: Programming population dynamics by engineered cell-cell communication*. UCSD, CA. June 2004.
42. *Beyond single cells: Programming population dynamics by engineered cell-cell communication*. Harvard Medical School, MA. May 2004.
43. *Beyond single cells: Programming population dynamics by engineered cell-cell communication*. UCSF, CA. April 2004.
44. *Beyond single cells: Programming population dynamics by engineered cell-cell communication*. Duke University, NC. March 2004.
45. *Beyond single cells: Programming population dynamics by engineered cell-cell communication*. Lehigh University, PA. January 2004.

Past invited talks

From bacteriophage T7 to "PhenoBank": Mathematical modeling for integrated understanding of biological systems, Texas A&M University, University of Houston, Eli Lilly & Company, University of Massachusetts at Amherst, University of Norte Dame, Johns Hopkins University, Purdue University, University of Pennsylvania, Lehigh University, UCSD, and Duke University (Jan-Apr 2002).