

CONTACT INFORMATION

Fred Hutchinson Cancer Research Center
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RESEARCH INTERESTS

Modeling and analysis of systems that impact public health, particularly cancer biomarker discovery, the immune response to infection, and vaccination strategies to reduce the spread of epidemics.

EDUCATION

Ph.D. in Computer Science, December 2004
The University of New Mexico • Albuquerque, NM
Dissertation: *Modeling the cytotoxic T cell response*
B.S.E. in Computer Science, 1994
Princeton University • Princeton, NJ

RECENT EMPLOYMENT

Staff scientist, July 2008–present
Fred Hutchinson Cancer Research Center • Seattle, WA
Postdoctoral fellow, 2004–June 2008
Fred Hutchinson Cancer Research Center • Seattle, WA
Research assistant, 1999–2004
Department of Computer Science of the University of New Mexico • Albuquerque, NM
Teaching assistant, 1998–1999
Department of Computer Science of the University of New Mexico • Albuquerque, NM
Technical staff, 1994–1998
EPSON Palo Alto Laboratory • Palo Alto, CA

PROFESSIONAL ACTIVITIES

Symposium organizer, Biological networks: from measurements to modeling, 2007.
Planning committee, FHCRC Bioethics Colloquium, 2006–2007.
Co-manager, FHCRC Interdisciplinary Club, 2005–2007.
The Pathobiology of Cancer: The Edward A. Smuckler Memorial Workshop, July 2005.
Santa Fe Institute Complex Systems Summer School, June 2000.
Founder, UNM Computer Science Graduate Student Association, 1999.

HONORS AND AWARDS

Student/Postdoc Advisory Committee course scholarship, FHCRC, 2005.

Dual Mentor Fellow, FHCRC, 2004–2006.

Research, Project, and Travel grant, UNM Office of Graduate Studies, 2002.

Student Research Allocations Committee grant, UNM Graduate and Professional Student Association, 2002.

Outstanding graduate student award, UNM Computer Science Department, 2002.

Passed Ph.D. comprehensive examination with distinction, UNM Computer Science Department, 2002.

Graduate Fellow, NSF BIO Research Training Group in Ecological Complexity, UNM, 1999–2001.

Membership in the Society of Sigma Xi, 1993.

JOURNAL PUBLICATIONS

D. L. Chao, C. A. Sanchez, P. C. Galipeau, P. L. Blount, T. G. Paulson, D. S. Cowan, K. Ayub, R. D. Odze, P. S. Rabinovitch, and B. J. Reid. Cell proliferation, cell cycle abnormalities, and cancer outcome in patients with Barrett's esophagus: A long-term prospective study. *Clin Cancer Res*, 14(21):6988–95, 2008.

D. L. Chao, J. T. Eck, D. E. Brash, C. C. Maley, and E. G. Luebeck. Pre-neoplastic lesion growth driven by the death of adjacent normal stem cells. *Proc Natl Acad Sci U S A*, 105(39):15034–15039, 2008.

D. L. Chao, C. C. Maley, X. Wu, D. C. Farrow, P. C. Galipeau, C. A. Sanchez, T. G. Paulson, P. S. Rabinovitch, B. J. Reid, M. R. Spitz, and T. L. Vaughan. Mutagen sensitivity and neoplastic progression in patients with Barrett's esophagus: A prospective study. *Cancer Epidemiology Biomarkers & Prevention*, 15(10):1935–40, 2006.

D. L. Chao, M. P. Davenport, S. Forrest, and A. S. Perelson. The effects of thymic selection on the range of T cell cross-reactivity. *European Journal of Immunology*, 35(12):3452–9, 2005.

M. P. Davenport, R. M. Ribeiro, **D. L. Chao**, and A. S. Perelson. Predicting the impact of a nonsterilizing vaccine against human immunodeficiency virus. *Journal of Virology*, 78(20):11340–51, 2004.

D. L. Chao, M. P. Davenport, S. Forrest, and A. S. Perelson. A stochastic model of cytotoxic T cell responses. *Journal of Theoretical Biology*, 228(2):227–40, 2004.

D. L. Chao, M. P. Davenport, S. Forrest, and A. S. Perelson. Modelling the impact of antigen kinetics on T-cell activation and response. *Immunology and Cell Biology*, 82(1):55–61, 2004.

D. L. Chao and S. Forrest. Information immune systems. *Genetic Programming and Evolvable Machines*, 4(4):311–31, 2003.

D. L. Chao and S. A. Levin. Herding behavior: The emergence of large-scale phenomena from local interactions. In S. Ruan, G. S. K. Wolkowicz, and J. Wu, editors, *Differential Equations with Applications to Biology*, volume 21 of *Fields Institute Communications*, pages 81–95. American Mathematical Society, Providence, Rhode Island, 1999.

D. Wagner, M. J. F. Brown, P. Broun, W. Cuevas, L. E. Moses, **D. L. Chao**, and D. M. Gordon. Task-related differences in the cuticular hydrocarbon composition of the harvester ant, *pogonomyrmex barbatus*. *Journal of Chemical Ecology*, 24(12):2021–37, 1998.

REFEREED CONFERENCE PUBLICATIONS

- R. M. Ribeiro, A. S. Perelson, **D. L. Chao**, and M. P. Davenport. HIV epidemiology and the impact of nonsterilizing vaccines. In R. P. Mondaini and R. Dilão, editors, *Proceedings of BIOMAT 2006: International Symposium on Mathematical and Computational Biology*, pages 69–88. World Scientific Publishing, Singapore, 2007.
- D. L. Chao**, J. Balthrop, and S. Forrest. Adaptive Radio: Achieving consensus using negative preferences. In K. Schmidt, M. Pendergast, M. Ackerman, and G. Mark, editors, *GROUP '05: Proceedings of the 2005 International ACM SIGGROUP Conference on Supporting Group Work*, pages 120–3. ACM Press, New York, 2005.
- D. L. Chao**, M. P. Davenport, S. Forrest, and A. S. Perelson. Stochastic stage-structured modeling of the adaptive immune system. In *Proceedings of the IEEE Computer Society Bioinformatics Conference (CSB 2003)*, pages 124–31. IEEE Press, Los Alamitos, California, 2003.
- D. L. Chao** and S. Forrest. Generating biomorphs with an aesthetic immune system. In R. Standish, M. A. Bedau, and H. A. Abbass, editors, *Artificial Life VIII: Proceedings of the Eighth International Conference on the Simulation and Synthesis of Living Systems*, pages 89–92. MIT Press, Cambridge, Massachusetts, 2003.
- D. L. Chao** and S. Forrest. Information immune systems. In J. Timmis and P. J. Bentley, editors, *Proceedings of the First International Conference on Artificial Immune Systems*, pages 132–40. University of Kent at Canterbury Printing Unit, Canterbury, England, 2002.
- D. L. Chao**. Doom as an interface for process management. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pages 152–7. ACM Press, New York, 2001.
- A. Pascovici, C. Li, J. Shu, and **D. L. Chao**. Ink reduction for cluster dot halftoning. In *Proceedings of the 1997 IS&T/SPIE International Symposium on Electronic Imaging Science and Technology*, volume 3018, pages 293–9. 1997.

OTHER PUBLICATIONS

- P. C. Galipeau, **D. L. Chao**, X. Li, J. D. Arnaudo, H. D. Kissel, C. A. Sanchez, and B. J. Reid. Barrett's esophagus and esophageal adenocarcinoma epigenetic biomarker discovery using Infinium methylation. *iCommunity Newsletter*, Illumina, Inc., San Diego, CA, 2008.
- D. L. Chao**. Computer games as interfaces. *interactions*, 11(5):71–2, 2004.

PATENTS

- D. L. Chao**. Color-patch sheet registration. U.S. Patent 6,404,517. Issued June 11, 2002.
- C. Li, A. Pascovici, J. Shu, and **D. L. Chao**. On-line ink-duty reduction. U.S. Patent 5,799,136. Issued August 25, 1998.