BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
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NAME	POSITION TITLE
Hunt, C. Anthony	Professor, Bioengineering and Therapeutic Sciences
eRA COMMONS USER NAME (credential, e.g., agency login) cahunt	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Georgia Institute of Technology	B.S.	1970	Chemistry
Georgia Institute of Technology	B.S.	1970	Applied Biology
University of Florida	Ph.D.	1977	Pharmaceutical Sciences

A. Personal Statement

I develop and use advanced modeling and simulation methods to achieve deeper, actionable insight into the multilevel mechanisms responsible for biomedical phenomena, from cells in experimental systems to tissues and organs to populations of individuals, in the presence and absence of interventions. An additional goal is to develop, challenge, and validate concrete, actionable theories of mechanistic translation among research, clinical, and drug development contexts. My current focus includes morphogenesis; the coupled influences of inter-, intracellular, and zonal tissue heterogeneity on transport, metabolism, and response to therapeutic (and potentially therapeutic) molecules in normal and diseased livers; and simulating in vitro to in vivo translation. I am a member of the Editorial Boards of Simulation, Transactions of the SCS, the International Journal of Knowledge Discovery in Bioinformatics, Computers in Bio;ogy and Medicine, and the Journal of Computational Biology and Bioinformatics Research. I am an AAAS and AAPS Fellow and a Director of The McLeod Modeling and Simulation Network. Since 2000, I have served on three Scientific Advisory Boards. Prior to that I was Director of UCSF's, Biotechnology Training Program. My computational biology track record, since transitioning from wet-lab to primarily computational research demonstrates consistent progress in advancing the frontier of scientific modeling and simulation. My modeling and simulation skills and knowledge were primarily acquired "on the job" and through over two-dozen workshops along with seven UCB and Stanford CS and AI graduate courses. I began the transition from wet-lab to computational research more than fifteen years ago, motivated by a desire to better understand individual variability in response to therapeutic interventions. My wet-lab and biotechnology background has contributed to development of a somewhat unique approach to multiscale modeling and simulation. Earlier, I had a successful track record inventing and developing novel therapeutics, targeted delivery, and siRNA methods. Five of 11 US patents resulting from that work earned UC income; three earned UC net income.

B. Positions and Honors

Positions and Employment

1980 - Department of Bioengineering and Therapeutic Sciences, Schools of Medicine and Pharmacy, UCSF
1988 - 1999 Director, University of California, San Francisco Biotechnology Training Program
1989 - 1995 Medical leave
1996 - 1998 Chair, Executive Committee, Graduate Group in Biological and Medical Informatics

Other Experience and Professional Memberships

1990 - Member, UCB/UCSF Graduate Group in Bioengineering
1995 - 1999 Chair, Executive Committee, UC Systemwide Biotechnology Program
1996 - 2000 Chair, Executive Committee, UC Systemwide Biotechnology STAR Project
1996 - Member, UCSF Graduate Group in Biological and Medical Informatics
1997 - 2000 Member, Board of Directors, California Institute for Health Systems Performance
1998 Chair, Executive Committee, UC Systemwide Task Force, Life Science Informatics
1998 - 2000 Member, Executive Committee, UC Life Science Informatics Program (now: UC Discovery)
1998 - 2000 Member, Executive Committee, UCB/UCSF Joint Bioengineering Graduate Group

1999 - 2000 Member, Scientific Advisory Board, Allergenics Inc.
1999 - 2003 Member, Scientific Advisory Board, PharmQuest Inc.
2000 - Director, Biosystems Group, UCSF

Honors and Awards

Phi Kappa Phi, Pi Tau Chi, Tau Beta Pi; BS in Chemistry with Highest Honors, Georgia Institute of Technology; Fellow, American Association of Pharmaceutical Scientists, Fellow, American Association for the Advancement of Science; 1984: Research Achievement Award, International Red Cross; US Patents Numbers 6,884,577 (2005), 6,410,721 (2002), 6,156,723 (2000), 5,859,226 (1999), 5,723,291 (1998), 5,624,803 (1997), 4,882,165 (1989), 4,612,370 (1986), 4,529,561 (1985), 4,425,334 (1984), 4,263,428 (1981).

C. Selected Peer-reviewed Publications (also see http://biosystems.ucsf.edu/publications.html)

Five most relevant to the current application

Hunt CA, Ropella GE, Lam TN, Gewitz AD (2011) Relational grounding facilitates development of scientifically useful multiscale models. *Theor Biol Med Model*. **8**:35. PMC3200146

Sheikh-Bahaei S, **Hunt CA** (2011) Enabling clearance predictions to emerge from in silico actions of quasi-autonomous hepatocyte components. *Drug Metab Dispos* **39**:1910-1920 (2011).

Ropella GEP, **Hunt CA** (2010) Cloud computing and validation of expandable In Silico Livers. *BMC Systems Biology* 4:168. PMC3016276

Park S, Kim SH, Ropella GEP, Roberts MS, **Hunt CA** (2010) Tracing multiscale mechanisms of drug disposition in normal and diseased livers. 2010. *J Pharmacol Exp Ther*. **334**:124-36. PMID: 20406856

Sheikh-Bahaei S, Maher JJ, **Hunt CA** (2010) Computational experiments reveal plausible mechanisms for changing patterns of hepatic zonation of xenobiotic clearance and hepatotoxicity. *J Theor Biol*. **265**(4):718-33. PMC3016276

Ten additional recent publications of importance to the field (chronological order)

Hunt CA, Ropella GE, Lam TN, Tang J, Kim SH, Engelberg JA, Sheikh-Bahaei S (2009) At the biological modeling and simulation frontier. *Pharm Res*. **26**(11):2369-400. PMC2763179.

Park S, Ropella GE, Kim SH, Roberts MS, **Hunt CA** (2009) Computational strategies unravel and trace how liver disease changes hepatic drug disposition. *J Pharmacol Exp Therap* **328**: 294-305, PMID: 1894849.

Kim SHJ, Park S, Mostov KE, Debnath J, **Hunt CA** (2009) Computational investigation of epithelial cell dynamic phenotype in vitro. *Theor Biol Med Mod*. **6**:8. PMC2696420

Kim SHJ, Debnath J, Mostov KE, Park S, **Hunt CA** (2009) A computational approach to resolve cell level contributions to early glandular epithelial cancer progression. *BMC Syst Biol*. **3**(1):122. PMC2814811

Lam TN, **Hunt CA** (2009) Discovering plausible mechanistic details of hepatic drug interactions. *Drug Metab Dispos* **37**: 237-246. PMC2653231

Lam TN, **Hunt CA** (2010) Mechanistic insight from in silico pharmacokinetic experiments: roles of p-glycoprotein, CYP3A4 enzymes, and microenvironments. *J Pharm Exp Therap* **332**(2):398-412. PMID: 19864617

Tang J, **Hunt CA** (2010) Identifying the rules of engagement enabling leukocyte rolling, activation, and adhesion. *PLoS Comput Biol* **6**(2):e1000681. PMC2824748

Hunt CA, Ropella GEP (2011) Moving beyond in silico tools to in silico science in support of drug development research. *Drug Devel Res* **72**:145-161.

Engelberg JA, Datta A, Mostov KE, **Hunt CA** (2011) MDCK cystogenesis driven by cell stabilization within computational analogues. PLoS Comput Biol 7(4): e1002030. PMC3072361

Kim SHJ, Jackson AJ, Hur R, **Hunt CA** (2012) Individualized, discrete event, simulations provide insight into intra- and interindividual variability of extended-release, drug products. *Theor Biol Med Mod*. **9**(1):39. PMID: 22938185

D. Research Support

Ongoing Research Support

R21-CDH-001014, CDH Research Foundation (Hunt, PI) 2/1/04-11/30/13
Technology Development Grant: Fundamentals of Agent-Based Models of Biological Systems

Build a computational infrastructure (computers, software, software frameworks, protocols, literature, collaborations, etc.) within the BioSystems Group that will enable us to initiate several long range projects designed to simulate and model biological systems, and position the group to initiate new projects as opportunities present. Build a software framework for representing biological systems at multiple, functional unit levels. Role: PI

DCHRP-02-0079, CDH Research Foundation (Hunt, PI) 12/1/05-1/31/13
Documenting Causal Networks in DMPK: A Novel Strategy to Expedite Drug Discovery and Development
Establish the feasibility of using discrete event, agent-based, componentized analogues of in vitro and in vivo systems to generate new insights, help develop a more solid understanding of the important mechanisms, and develop methodologies for anticipating the consequences of interventions. Role: PI

Alternatives Research & Development Foundation (Hunt, PI) 07/1/10-06/30/13
Development of Virtual Rat Liver for Pharmacological and Toxicological Investigations
Discover, develop, and validate mechanistic, physiologically based, multi-scale virtual livers that in later project stages will be merged to become individualizable virtual patients. The method involves building modular, executable, biomimetic components and mechanisms that can be composed hierarchically to form a virtual liver. The approach provides a scientific means to explore and test plausible mechanistic hypotheses, when it would be too difficult, too expensive, infeasible, or unethical to do so in animals and humans. Role: PI

US EPA ID Number: G10C20235 (J. Glazier, PI) 04/1/11-03/30/14
Data Management and Model Specification Tools for Biologically-based Multi-Scale Computational Liver Toxicology Role: PI of subcontract

NSF # 1047867 (L. Yilmaz, Auburn U, PI) 10/1/11-09/30/14
SI2-SSE: Dynamically Reconfigurable, Robust, and Creative Cyber-Discovery System to Explore and Explain Biological Mechanisms Role: co-Investigator

To achieve the envisioned, long-term objectives of opening fundamentally new pathways for scientific discovery and innovation in biomedical research, virtual Hepatocytes and their enabling virtual Cultures will be designed and deployed along with an online biological mechanism discovery service to establish a community around a virtual experimentation platform.

1 U01 HL 111008-01 (Keith E. Mostov & C. A. Hunt, PIs) 12/01/11–11/30/16
Consortium of Lung Repair and Regeneration: Building the Foundation

We use live cell imaging to follow and study how the surviving cells in Alveolar-Like Cysts (ALC) spread and proliferate, testing several hypotheses about how molecular level interventions, alone and in combination, improve or disrupt ALC repair. To facilitate gaining insight into those complex processes at each experimental stage, we will build, challenge, and validate highly innovative, mechanism-based, 2D & 3D in silico models that allow us to discover and later observe and challenge plausible operating principles and likely cause-effect relationships.

Most Recently Completed Research Support

UCSF - Clinical and Translational Science Institute
Programs Strategic Opportunities Support (SOS) Center (Hunt, PI) 7/1/07-6/30/09
From basic epithelial cell biology to deeper insights into treatment of acute lung injury: novel methods for enabling translation. Role: PI