

Michael G. Dodds, Ph.D.

PK/PD, Pre-clinical Development
ZymoGenetics, Inc.
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Education

University of Washington, Seattle, WA, 2000-2004

Ph.D., Bioengineering, 2004

Dissertation: Robust Population Pharmacokinetic Experiment Design, advised by Dr. Paolo Vicini

Montana State University, Bozeman, MT, 1996-1998

M.S., Chemical Engineering, 1998

Thesis: Modeling Biofilm Antimicrobial Resistance, advised by Dr. Phil Stewart

North Carolina State University, Raleigh, NC, 1991-1995

B.S., Chemical Engineering with Bioscience Emphasis, 1995

B.S., Biochemistry, 1995

Minor in Computer Science, 1995

Minor in English Literature, 1995

North Carolina School of Science and Mathematics, Durham, NC, 1989-1991

Honors for Research in Biology: symposia presentation to the North Carolina Academy of Sciences

Experience

Scientist, Department of Pre-Clinical Development, ZymoGenetics Inc, Seattle, WA, 2004-present

- Population PK/PD modeling of clinical and pre-clinical development drugs
- Support of transitional emerging drug candidates

Graduate Research Assistant, Resource for Population Kinetics, Department of Bioengineering, Seattle, WA, 2000-2004

- Assessment of convergence diagnostics for use with Monte-Carlo-based Bayesian population analysis tools
- Implementation of uncertain prior information within optimal design theory

System Administrator, American Data Technology, RTP, NC, 1998-1999

- Maintained and monitored diverse hosting network
- Lead customer troubleshooting contact; new site installation
- Primary custom software designer for intranet applications

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Graduate Research Assistant, Center for Biofilm Engineering, Montana State University, Bozeman, MT, 1996-1998

- Disinfection studies to ascertain importance of stress response genes in *E.coli* artificial biofilms
- Model development seeking to encapsulate engineering and microbiological facets of biofilm resistance to antimicrobial agents

Year-Round Intern, Drug Metabolism, Glaxo-Wellcome, RTP, NC, 1994-1996

- Developed automated sample analysis system for metabolism and excretion studies featuring module-oriented robotics unit coupled to a relational database
- Provided automation support for Research compounds in the form of a flexible Zymark robotics unit driven by flexible GUI with real-time remote feedback

Research Interests

Optimal experiment design in population analysis

- Application of optimal design theory to population PK/PD modeling
- Fast and efficient computational methods to model uncertainty in parameters
- Scaling of prior information to predict novel experiments

PK/PD modeling

- Structural models that describe and predict physiological function
- Modeling biological therapies and their interaction with the body

Teaching Experience

Invited Lecturer, Department of Applied Mathematics, University of Washington, 2004: "Compartmental Modeling for Pharmacology and Metabolics"

- PK case-studies illustrating the flexibility of compartmental models in describing physiological systems
- Emphasis on contrasting identifiability and utility of each model with detail and rigor of the model's mechanistic description

Conference Workshop, 2nd Joint Meeting of the IEEE Engineering in Medicine and Biology Society and the Biomedical Engineering Society, Houston, TX, 2002: "Real World Biomedical Modeling Techniques Through Case Studies"

- Hands-on individual PK/PD analysis case-studies as vehicles to describe basic modeling principles such as parsimony, data weighting, two-stage analysis and prior information

Teaching Assistant, Bioengineering 540: "Problem Solving in Bioengineering", University of Washington, 2001.

- Design and delivery of a module on system identification
- Responsible for exam preparation, tutorial and review

Invited Lecturer, Communications Department, NCSU, 1999: "Current E-Commerce Technology"

- Overview of commerce components, security requirements, and transaction processing in an electronic commerce environment

Teaching Assistant, Biochemistry 454. NCSU, 1996.

- Design of course website, electronic resources, and lecture transfer

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Honors and Awards

NSF Graduate Award, MSU, 1996-1998.

Travel Awards, ASM Special Conference on Biofilms 1996, AIChE Annual Conference 1998.

Publications and Professional Discourse

Peer Reviewed

Dodds MG, Hooker AC, Vicini P. Robust Population Pharmacokinetic Experiment Design. *J Pharmacokinetic Pharmacodyn.* 2005 Oct 3; [Epub ahead of print]

Krudys KM, Dodds MG, Nissen SM, Vicini P. Integrated model of hepatic and peripheral glucose regulation for estimation of endogenous glucose production during the hot IVGTT. *Am J Physiol Endocrinol Metab.* 2005 May;288(5):E1038-46. Epub 2005 Jan 4.

Dodds MG and Vicini P. Assessing convergence of Markov Chain Monte Carlo simulations in Bayesian models for population pharmacokinetics. *Ann Biomed Eng.* 2004 Sep;32(9):1300-13.

Hooker AC, Foracchia M, Dodds MG, Vicini P. An evaluation of population D-optimal designs via pharmacokinetic simulations. *Annals of Biomedical Engineering.* Vol 31, Number 1, 2003.

Dodds MG, Grobe KJ and Stewart PS. Modeling biofilm antimicrobial resistance. *Biotechnology and Bioengineering,* Vol 68, Number 4, May 20, 2000.

Abstracts

Hooker AC, Dodds MG, Vicini P. Evaluating the predictive power of the Fisher information matrix in population optimal experimental design. Presented at the Population Approach Group Europe Conference, Uppsala, Sweden, 2004.

Dodds MG, Hooker AC and Vicini P. Robust Population Pharmacokinetic Experiment Design. Presented at the Population Approach Group Europe Conference, Uppsala, Sweden, 2004.

Dodds MG, Vicini P, Visich JE and Rogge M. A Population PK Model for Recombinant Factor XIII in Congenitally Deficient Subjects. Presented at the Population Approach Group Europe Conference, Uppsala, Sweden, 2004.

Dodds MG, Vicini P, Visich JE and Rogge M. A population model for recombinant factor XIII in healthy volunteers. Presented at the AAPS Biotechnology Conference, Boston, MA, 2004.

Dodds MG, Vicini P and Gastonguay MR. Assessing convergence of Markov Chain Monte Carlo simulations in hierarchical Bayesian models for population pharmacokinetics. Presented at the AAPS Annual Meeting and Exposition, Toronto, 2002.

Dodds MG and Vicini P. Assessing convergence in pharmacokinetic bayesian analysis. Presented at the Biomedical Engineering Society Annual Meeting, Durham, NC, 2001.

Dodds MG, Hooker AC, Bell BM. Realistic optimal experimental design. Presented at the AAPS Annual Meeting and Exposition, Seattle, WA, 2000.

Dodds MG. Reaction-diffusion theory for biofilm control. Presented at the AIChE Annual Meeting, Los

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Angeles, CA, 1997.

Lloyd TL and Dodds MG. Flexible automation tools for drug metabolism. Proceeds of the International Symposium on Laboratory Automation and Robotics, 1995.