

JENNIFER KATHERINE MANN

EDUCATION

- 2002-2007 Doctoral research in Biomedical Mathematics, Ph.D., Florida State University, Tallahassee, FL
Primary Mentor: De Witt L. Sumners, Ph.D.; Co-Mentor: E. Lynn Zechiedrich, Ph.D.
Ph.D. Dissertation Title: DNA Knotting: Occurrences, Consequences & Resolution
Funding: Program in Mathematics and Molecular Biology, Burroughs Wellcome Fund Interfaces Program
- 1999-2002 M.S. degree in Biomedical Mathematics, Florida State University, Tallahassee, FL
- 1997-1999 M.S. degree in Mathematics, University of South Alabama, Mobile, AL
- 1989-1993 B.S. degree in Mathematics, The University of the South, Sewanee, TN

EXPERIENCE

- 2002-present Research Assistant of E. Lynn Zechiedrich, Molecular Virology & Microbiology Department, Baylor College of Medicine, Houston, TX
- 2000-present Research Assistant of De Witt Sumners, Mathematics Department, Florida State University, Tallahassee, FL
- 1999-2000 Teaching Assistant, Mathematics Department, Florida State University, Tallahassee, FL
- 1997-1999 Graduate Assistant, Mathematics Department, University of South Alabama, Mobile, AL
- 1993-1997 Mathematics Teacher, West Carroll High School, Atwood, TN
- 1990-1993 Tutor and Grader, Mathematics Department, The University of the South, Sewanee, TN

HONORS AND PROFESSIONAL SOCIETIES

- Program in Mathematics and Molecular Biology Predoctoral Fellow
- Third Place Poster Winner, W. M. Keck Center for Computational and Structural Biology & Houston Area Molecular Biophysics Program, 2003 Annual Research Conference, Hilton Houston NASA Clear Lake, Texas, October 3, 2003, "Unknotting by Type II Topoisomerases"
- Pi Mu Epsilon, national honorary mathematics society
- Alpha Theta Chi, collegiate honor society
- Order of the Gownsmen, academic honor society at The University of the South
- American Mathematical Society
- Association for Women in Mathematics
- Society for Industrial and Applied Mathematics
- Society for Mathematical Biology

PUBLICATIONS

PEER REVIEWED PUBLICATIONS

1. Topological Information Embodied in Local Juxtaposition Geometry Provides a Statistical Mechanical Basis for Unknotting by Type-2 DNA Topoisomerases, Zhirong Liu, Jennifer K. Mann, E. Lynn Zechiedrich and Hue Sun Chan (2006) *J. Mol. Biol.* **361**, 268-285.

SUBMITTED OR IN PREPARATION

2. Hin-Mediated DNA Knotting and Recombination Promote Replicon Dysfunction and Mutation Richard W. Deibler*, Jennifer K. Mann*, De Witt L. Sumners and E. Lynn Zechiedrich. *Submitted*. (*The first two authors contributed equally to this work.)
3. Human Topoisomerase II α Resolves Biological DNA Knots in a Single Step: Implications for Efficient Type II Topoisomerase Unknotting. *In preparation*. Jennifer K. Mann, Richard W. Deibler, De Witt L. Sumners, E. Lynn Zechiedrich.

- Population Evolution of Various Knot Types Driven by Topoisomerase II-like Segment Passages at Various Juxtaposition Geometries. *In preparation.* Jennifer K. Mann, Zhirong Liu, De Witt L. Sumners, E. Lynn Zechiedrich and Hue Sun Chan.

ABSTRACTS

- DNA Knotting & Unknotting, Jennifer K. Mann, Richard W. Deibler, De Witt L. Sumners, E. Lynn Zechiedrich, (2005) *Abstracts of papers presented to the American Mathematical Society.* **26**: 1004-92-184.
- Unknotting by Type II Topoisomerases, Jennifer K. Mann, Richard W. Deibler, De Witt L. Sumners, E. Lynn Zechiedrich, (2004) *Abstracts of papers presented to the American Mathematical Society.* **25**:994-92-187.
- Topology of Type II Topoisomerases, Jennifer K. Mann, Richard W. Deibler, De Witt L. Sumners, E. Lynn Zechiedrich, (2002) *SIAM Annual Meeting.*

INVITED LECTURES AND OTHER PRESENTATIONS

- The Mathematics of Knotting and Linking in Polymer Physics and Molecular Biology, Banff International Research Station, Alberta, Canada, May 20-25, 2007, Research Presenter
- Sumnersfest: Conference on Low-Dimensional Topology and Applications to Molecular Biology and Biomedical Mathematics, Florida State University, Tallahassee, FL, May 4-5, 2007, Research Presenter
- Molecular Virology & Microbiology Departmental Seminar, Baylor College of Medicine, Houston, TX, March 15, 2007
- Mathematical Biology and Dynamical Systems, The University of Texas at Tyler, Tyler, TX, October 7-9, 2005, Research Presenter, "DNA Unknotting by Human Topoisomerase II α "
- 10th Annual Structural Biology Symposium, Sealy Center for Structural Biology, The University of Texas Medical Branch, Galveston, TX, May 20-21, 2005, Poster Presenter, "Unknotting by Type II Topoisomerases"
- AMS Spring Southeastern Section Meeting, Western Kentucky University, Bowling Green, KY, March 18-19, 2005, Research Presenter, "DNA Knotting & Unknotting"
- 2004 Lost Pines Molecular Biology Conference, UT M.D. Anderson Cancer Center, Science Park, Smithville, TX, October 22-24, 2004, Research Presenter, "DNA Unknotting by Human Topoisomerase II α "
- International Summer School on "DNA and Chromosomes: Physical and Biological Approaches," Institut d'Etudes Scientifiques de Cargese, Corsica, France, August 2-14, 2004, Poster Presenter, "Unknotting by Type II Topoisomerases"
- VI International Joint Meeting AMS and the Sociedad Matemática Mexicana (SMM), Hyatt Regency Houston, Houston, Texas, May 13-15, 2004, Research Presenter, "Unknotting by Type II Topoisomerases"
- AMS Spring Southeastern Section Meeting, Tallahassee, Florida, March 12-13, 2004, Research Presenter, "Unknotting by Type II Topoisomerases"
- Baylor College of Medicine Molecular Virology & Microbiology Research Retreat 2003, Warwick Hotel, Houston, Texas, November 21, 2003, Research Presenter, "Unknotting by Type II Topoisomerases"
- W. M. Keck Center for Computational and Structural Biology & Houston Area Molecular Biophysics Program, 2003 Annual Research Conference, Hilton Houston NASA Clear Lake, Texas, October 3, 2003, Third Place Poster Winner, "Unknotting by Type II Topoisomerases"
- Statistical Mechanics of Polymer Models, Banff International Research Station, Alberta, Canada, May 10-15, 2003, Research Presenter, "Unknotting by Type II Topoisomerases"
- Department of Mathematics Colloquium, Rice University, April 10, 2003 "Unknotting by Type II Topoisomerases"

15. Celebration of the Career of Clay C. Ross, The University of the South, April 5, 2003 “Topology, Enzymes & DNA”
16. Math Career Lecture Series, Rice University, February 25, 2003 “Mathematics in Molecular Biology”
17. SIAM 2002 Annual Meeting & AWM Workshop, Philadelphia, PA, July 8–12, 2002, Poster Presenter & Student Day Speaker, “Topology of Type II Topoisomerases”
18. “Mathematics and Molecular Biology VII: Modeling Across the Scales- Atoms to Organisms,” Santa Fe, NM, January 5-10, 2002, Poster Presenter, “Topology of Type II Topoisomerases”

ATTENDED COURSES AND CONFERENCES

1. Cozzarelli Memorial Symposium, Department of Molecular and Cell Biology, Berkeley, CA, June 10, 2006
2. 4th Biannual Structural Biology Symposium “Computational Structural Biology: From Simulation to Experiment & Back,” Florida State University, January 18-21, 2001
3. MSRI/PMMB short course “Mathematical and Computational Challenges in Molecular and Cell Biology,” Mathematical Sciences Research Institute, Berkeley, CA, June 12-23, 2000
4. “Advances & Opportunities at the Biology/Math/Computation/Physical Sciences,” Rutgers University, March 6-7, 1999

TEACHING

- Nucleic Acid Structure and Function Class Guest Lecturer, Florida State University, March 13, 2007, “DNA Knotting: Biological Consequences & Resolution”
- Molecular Virology & Microbiology Journal Club, Baylor College of Medicine, December 9, 2005, “Sense & Sensibility in Bacterial Flagellum”
- Molecular Virology & Microbiology Journal Club, Baylor College of Medicine, September 30, 2005, “*Listeria monocytogenes*: Invasion and Defense”
- Mathematical Biophysics Class Guest Lecturer, Florida State University, October 14, 2004, “Going Behind & Beyond the Experiments”
- Genome Instability Group Meeting, Baylor College of Medicine, April 23, 2004, “Unknotting by Type II Topoisomerases”
- Biomedical Mathematics Projects Class, Florida State University, February 18, 2003 “Experiences of a Mathematician in a Molecular Biology Lab”
- Biomedical Mathematics Seminar, Florida State University
“DNA Unknotting by Human Topoisomerase II α ” October 12, 2004
“Investigating DNA Twist Knots” April 17, 2002 and February 18, 2003
“DNA Unknotting in *E. coli*” February 26, 2002
- Nucleic Acid Structure and Function class presentation, Florida State University, March 25, 2001
“How do type II topoisomerases reduce in vitro knotting?”
- Graduate Student Seminar, Florida State University
“DNA Knots & Catenanes” February 13, 2002
“Exploring the Möbius Strip” September 19, 2001
“An Introduction to Knot Theory & Its Applications” February 8, 2001
- Biomedical Mathematics Seminar, Florida State University
“ $Lk = Tw + Wr$: How is this equation used to understand DNA conformation?” January 29, 2002
“Topology of Type II Topoisomerases” January 22, 2002
“Knots in Proteins” October 4, 2000

COLLABORATORS

Hue Sun Chan, Ph.D., Faculty of Medicine, Department of Biochemistry and Department of Medical

Genetics and Microbiology, University of Toronto, Toronto, Ontario, Canada
Richard W. Deibler, Ph.D., Postdoctoral Associate, Department of Systems Biology, Harvard
Medical School, Boston, MA
Zhirong Liu, Ph.D., Postdoctoral Associate, Department of Biochemistry and Department of Medical
Genetics and Microbiology, University of Toronto, Toronto, Ontario, Canada

SUPERVISION OF TRAINEES

Elizabeth Jones, Baylor College of Medicine Structural and Computational Biology & Molecular Biophysics
(SCBMB) graduate student, Spring 2006
Daniel J. Catanese, Baylor College of Medicine, Postdoctoral Associate, Summer 2005
Graham Randall, Baylor College of Medicine, SCBMB graduate student, Fall 2003
Amadeo Biter, Baylor College of Medicine, SCBMB graduate student, Fall 2003
Natalie Fonville, Baylor College of Medicine, Molecular & Human Genetics graduate student, Fall 2003
Eileen Meyer, Rice University, Physics undergraduate student, Summer 2003

SERVICE

2002 Pi Mu Epsilon Florida Beta Chapter Graduate Co-Sponsor, Mathematics Department,
Florida State University
2001-2002 Graduate Student Representative on Curriculum Committee, Mathematics Department,
Florida State University
2000-2001 Pi Mu Epsilon Historian, Mathematics Department, Florida State University
2000-2002 Graduate Student Seminar Organizer, Mathematics Department, Florida State University

COMPUTER EXPERTISE

Languages: C, C++, HTML
Operating Systems: Windows, UNIX, Mac
Other: Maple, XMGR, Mathematica, Matlab
Website Development & Maintenance:
Sumnersfest, <http://www.math.fsu.edu/~jmann/Sumnersfest.html>
Zechiedrich Lab, <http://www.bcm.edu/labs/zechiedrich/>
FSU Math Department Graduate Student Seminar 2000-2002, <http://www.math.fsu.edu/~jmann/seminar/>