

CURRICULUM VITAE

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Education

- Ph.D. **Physical Chemistry**, University of Nebraska–Lincoln, Lincoln, Nebraska (1998)
Ph.D. Dissertation: *Second-order Nonlinear Optical Properties of Organic Molecules and Polymeric Thin Films for Photonics Applications*
Dissertation advisor: C. H. (Jim) Wang, Mabel D. Clark Distinguished Professor of Chemistry
Post-baccalaureate studies in **Computer Science**, University of North Carolina at Chapel Hill/North Carolina State University (1991 – 1992)
- M.S. **Physical Chemistry**, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina (1991)
- B.S. **Chemistry** (ACS certified), University of Florida (Honors Program), Gainesville, Florida (1989)
Innsbruck International Summer School, Innsbruck, Austria, University of New Orleans/University of Florida (summer 1987)

Academic/Teaching Experience

- 2006 – **Associate Director**, College of Information Science & Technology Undergraduate Bioinformatics Program, University of Nebraska at Omaha, Omaha, NE
- 2004 – **Faculty** (courtesy), Department of Genetics, Cell Biology and Anatomy, University of Nebraska Medical Center, Omaha, NE
- 2003 – **Faculty**, Nebraska Informatics Center for the Life Sciences, Omaha, NE
- 2001 – **Senior Research Fellow**, College of Information Science & Technology, University of Nebraska at Omaha, Omaha, NE
- 1999 – **Lecturer**, Department of Computer Science, University of Nebraska at Omaha, Omaha, NE

Other Experience

- 1998 – 2001 **Laboratory Manager/Developer**, College of Information Science & Technology, University of Nebraska at Omaha, Omaha, NE.

- 1993 – 1995 **Manager**, Personal Computer Laboratory, Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE
- 1992 – 1998 **Research Assistant**, Laser Spectroscopy & Polymer Physics Laboratory, Department of Chemistry, University of Nebraska–Lincoln, Lincoln, NE
- 1990 – 1992 **Manager**, Computer Graphics Laboratory, University of North Carolina at Chapel Hill, Chapel Hill, NC

Courses Taught/Developed

- *Introduction to Computer Science I* (taught)
- *Introduction to Computer Science I Laboratory* (taught/developed)
- *Introduction to Computer Programming II* (taught)
- *Java Programming* (taught)
- *Introduction to Bioinformatics* (taught/developed)
- *Introduction to Bioinformatics II* (originally *Introduction to Bioinformatics*) (taught/developed)
- *Introduction to Web Development* (originally *Introduction to Web Programming*) (taught/developed)

Workshops Taught/Developed

- *Upward Bound Robotics Workshop* – Week of 27 June 2005 (3 hrs/day for 5 days). Implemented a workshop for a group of high school Upward Bound students that provided a hands-on introduction to fundamental concepts in Computer Science using the Lego RoboLAB system.
- *Minorities in Information Technology and Engineering Workshop* – Week of 12 July 2004 (3 hrs/day for 5 days). Implemented a workshop for a group of under-represented high school students that provided a hands-on introduction to fundamental concepts in Computer Science and Engineering using the Lego RoboLAB system. Done in conjunction with the University of Nebraska–Lincoln College of Engineering and Technology.
- *Boys Town CyberCamp* – Week of 21 July 2003 (3 hrs/day for 5 days). Developed and implemented a workshop for hearing-impaired students affiliated with Boys Town Research Hospital in which the participants were taught basic HTML and web-design.
- *Diversity in IT & Engineering Workshop* – Week of 11 July 2003 (3 hrs/day for 5 days). Developed and implemented a new workshop for a group of under-represented high-school students that provided a hands-on introduction to fundamental concepts in Computer Science and Engineering using the Lego RoboLAB system. Done in conjunction with the University of Nebraska–Lincoln College of Engineering and Technology.
- *Women in IT & Engineering Workshop** – Week of 16 June 2003 (3 hrs/day for 5 days). Implemented a workshop for a group of female high school students that provided a hands-on introduction to fundamental concepts in Computer Science and Engineering using the Lego RoboLAB system. Done in conjunction with the University of Nebraska–Lincoln College of Engineering and Technology.
- *Upward Bound IT Workshop* – Weeks of 3 and 10 June 2002 (3 hrs/day for 8 days). Developed and implemented a workshop for a group of high school students that provided an interactive introduction

*A story describing this workshop was distributed by the Associated Press and appeared in newspapers around the country, including USA Today (http://www.usatoday.com/tech/news/2003-06-17-girls-tech-camp_x.htm), on 17 June 2003.

to information technology. In the workshop, the participants developed an amusement park using the computer game *Roller Coaster Tycoon* and then used different computer programs to develop a budget (using *Excel*), web site (using *FrontPage*) and advertising (using *PowerPoint*) for their amusement park.

Other Academic Experience

Bioinformatics Undergraduate Degree – University of Nebraska at Omaha. Member of a small group of faculty members who developed and implemented an undergraduate major in bioinformatics at the University of Nebraska at Omaha. The degree officially became available in fall 2004. At the time of creation, the degree was one of a very few of its kind in the nation.

Funding History

1. *Med-IT, Data Management System* (pending)
McCallie Associates, Inc./National Institutes of Health
Project goal(s): Develop and test a secure, HIPPA-compliant, web-based patient information system for breast and cervical cancers that provides for the widespread tracking of patient information; develop and test a set of data mining tools that allows for static and dynamic queries of the data.
Role: Principle Investigator (subcontract) (Grant PI: Carolyn Wendover, McCallie Associates, Inc.)
Requested budget: \$47,107 (subcontract)
Proposed period covered: 2007 - 2008
2. *Elucidation of Microbial Response to Temperature Variation and the Diurnal Cycle in the Yellowstone Octopus Hot Spring: A Proteomic Study* (pending)
University of Nebraska Medical Center/National Science Foundation
Project goal(s): Characterize microbial species resident in the mat communities of the hot springs of Yellowstone National Park by identifying expressed proteins present under particular environmental circumstances.
Role: Collaborator (Grant PI: Laurey Steinke, University of Nebraska Medical Center)
Requested budget: \$21,150 (subcontract)
Proposed period covered: 2007 - 2010
3. *Establishing Probable Roles of miRNAs through Target Gene Identification and Validation* (pending)
Creighton University/National Institutes of Health
Project goal(s): Using bioinformatic algorithms establish probable roles of neurosensory miRNAs (microRNAs) through target gene identification and validation.
Role: Principle Investigator (subcontract) (Grant PI: Garret Soukup, Creighton University)
Requested budget: \$192,454 (subcontract)
Proposed period covered: 2007 - 2011
4. *Bioinformatics Mini-Course* (active)
A mini-grant through the University of Nebraska at Omaha's Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) grant
Project goal(s): To develop a short (one- to four-hour) mini-course that would provide a hands-on introduction to the field of bioinformatics. The course would be used as a recruiting tool for the bioinformatics program.
Grant Number: N/A (internal)
Role: Principle Investigator
Budget: \$2,500
Period covered: 2006 - 2007

5. *Nebraska Research Network in Functional Genomics – Renewal* (active)
University of Nebraska Medical Center/National Institutes of Health
Project goal(s): Enhance the competitiveness of biomedical research in Nebraska by developing the human and technological resources essential for research in functional genomics (overall goal).
Develop a gene-based annotation database, to integrate primer selection into the database and to provide an updated high-throughput primer selection program in the public domain.
Grant Number: P20 RR 16469-04
Role: Investigator (subcontract) (Grant PI: James Turpen, University of Nebraska Medical Center)
Budget: \$1,057,500 (subcontract)
Period covered: 2004 - 2009
6. *UNO and MCC STEPping Together* (active)
National Science Foundation, Division of Undergraduate Education
Project goal(s): Increase associate and bachelors degrees in the STEM areas of biology, chemistry, computer science, geology, mathematics and physics in the state of Nebraska.
Grant Number: DUE-0336462
Role: Investigator (Grant PI: Jack Heidel, University of Nebraska at Omaha).
Budget: \$1,999,348
Period covered: 2004 - 2009
7. *Construction of a Targeted Rhesus Macaque Microarray*
UNMC/National Institutes of Health
Project goal(s): Develop a microarray GeneChip™ for the rhesus macaque monkey.
Grant Number: R24 RR017444
Role: Investigator (subcontract) (Grant PI: Robert Norgren, University of Nebraska Medical Center)
Budget: \$411,713 (subcontract)
Period covered: 2003 - 2006
8. *Nebraska Training Network in Functional Genomics – Supplement*
UNMC/National Institutes of Health
Project goal(s): Increase the competitiveness of the state of Nebraska in the area of biomedical research.
Grant Number: P20 RR 16469
Role: Investigator (subcontract) (Grant PI: James Turpen, University of Nebraska Medical Center)
Budget: \$199,923 (subcontract)
Period covered: 2003 - 2004
9. *Development of Website to Support New NHS Cardiac Catherization Laboratory*
University of Nebraska Medical Center
Project goal(s): Development a website to support the (new) Cardiac Catherization Laboratory at Nebraska Health Systems
Grant Number: N/A (internal)
Role: Investigator (Grant PI: Quiming Zhu, University of Nebraska at Omaha)
Budget: \$37,571
Period covered: 2000 - 2001
10. *Pilot Project to Demonstrate the Feasibility of Using the Internet for Acquisition and Review of Diagnostic Images for American Board of Radiology Examination Item Pools*
American Board of Radiology
Project goal(s): Develop a system to allow students to take the American Board of Radiology exam over the Internet.
Grant Number: N/A (internal)
Role: Investigator (Grant PI: Quiming Zhu, University of Nebraska at Omaha)

Budget: \$43,316
Period covered: 1998 - 1999

Professional Affiliations

- Member, American Association for the Advancement of Science (AAAS), 2006 – Present
- Member, International Society for Computational Biology (ISCB), 2006 – Present
- Member, Association for Computing Machinery (ACM), 2005 – Present
- Member, Bioinformatics Research Triangle, University of Nebraska at Omaha, 2005 – Present
- Member, Institute of Electrical and Electronics Engineers (IEEE), 2002 – Present

Publications and Presentations

1. C. Lawson and M. Pauley, "Development of an Image Analysis Tool Using Python," An oral presentation at the *Nebraska Academy of Sciences Meeting*, Lincoln, NE, April 2007.
2. D. Recek and M. Pauley, "Web-based Alignment Matrix Creation Tool," An oral presentation at the *Nebraska Academy of Sciences Meeting*, Lincoln, NE, April 2007.
3. F. Duan, M. Pauley and R. Norgren, "Effects of Mismatch Positions in Probes on Oligonucleotide DNA Microarrays," A poster presentation at *5th Annual Nebraska INBRE/BRIN Meeting*, Grand Island, NE, August 2006.
4. C. Lawson and M. Pauley, "Development of a Web-based FASTA-file Converter," A poster presentation at the *4th Annual Nebraska INBRE/BRIN Meeting*, Grand Island, NE, August 2006.
5. A. Islam, C. Wendover, D. Bastola, M. Pauley and H. Ali, "Med-IT: Medical Information Tracking", A poster presentation at the *33rd Annual Midwest Business Technology Expo & Conference (InfoTec 2006)*, Lincoln, NE, April 2006.
6. C. Lawson, B. Knipe, R. Potula, Y. Persidsky, G. Kanmogne and M. Pauley, "Development of Small Animal Model for HIV-1-Induced Alveolitis: Implications for Pathogenesis and Novel Treatment Approaches," An oral presentation at the *Nebraska Academy of Sciences Meeting*, Lincoln, NE, April 2006.
7. E. R. Spindel, M. A. Pauley, Y. Jia, C. Gravett, S. L. Thompson, N. F. Boyle, S. R. Ojeda and R. B. Norgren, "Leveraging human genomic information to identify nonhuman primate sequences for expression array development," *BMC Genomics*, **6**, 160 (2005).*
8. A. Tchourbanov, M. Pauley, D. Quest and H. Ali, "A method of precise mRNA/DNA homology-based gene structure prediction," *BMC Bioinformatics*, **6**, 261 (2005).†
9. E. Spindel, M. Pauley and R. Norgren, "Leveraging Human Genomic Information to Identify Non-human Primate Sequences for Expression Array Development," A poster presentation at the *4th Annual Nebraska INBRE/BRIN Meeting*, Grand Island, NE, August 2006.
10. R. Norgren, M. Pauley and E. Spindel, "Construction of a Rhesus Macaque Expression GeneChip: A Targeted Sequence Acquisition Approach," An oral presentation at the *Seattle International Conference on Primate Genomics*, Seattle, WA, March 2005.
11. B. Ghahramani and M. A. Pauley, "Java in High-Performance Environments," *IEEE Computer*, **36** (9), 109 (2003).

* A story describing the Affymetrix GeneChip developed as the result of the work described in this paper was distributed by the Associated Press and appeared in newspapers around the world (including *USA Today*, http://www.usatoday.com/tech/science/discoveries/2005-11-29-monkey-gene-chip_x.htm) during the last week of November 2005.

† Designated "Highly Accessed" by the journal.

12. A. Tchourbanov, D. Quest, H. Ali, M. Pauley and R. Norgren, "A New Approach for Gene Annotation Using Unambiguous Sequence Joining," *Proceedings/IEEE Computer Society Bioinformatics Conference*, **2**, 353 (2003).
13. M. A. Pauley, "Automation of Primer Selection in a Large-Scale Microarray Project," An oral presentation at the *Diversity of Informatics Conference*, Lincoln, NE, April 2002.
14. M. A. Pauley, G. V. Dalrymple, Q. Zhu and W.-K. Chu, "Acquisition and Review of Diagnostic Images for Use in Medical Research and Medical Testing Examinations," *Proceedings of SPIE*, **4311**, 333 (2001).
15. M. A. Pauley, B. Pitman, G. V. Dalrymple, Q. Zhu, W.-K. Chu, R. Wobig and R. Bunting, "Demonstration of the Feasibility of Using the Internet for Acquisition and Review of Diagnostic Images for Use in Medical Research and for Medical Testing Examinations," *Proceedings/IEEE EIT Conference*, **1**, 203 (2000).
16. M. A. Pauley and C. H. Wang, "Hyper-Rayleigh Scattering Measurements at 1907 nm," *Review of Scientific Instruments*, **70**, 1277 (1999).
17. M. A. Pauley and C. H. Wang, "Hyper-Rayleigh Scattering Measurements of Nonlinear Optical Chromophores at 1907 nm," *Chemical Physics Letters*, **280** (5/6), 544 (1997).
18. O.-K. Song, C. H. Wang and M.A. Pauley, "Dynamic Processes of Optically Induced Orientation of Azo Compounds in Amorphous Polymers below T_g ," *Macromolecules*, **30** (22), 6913 (1997).
19. J. N. Woodford, M. A. Pauley and C. H. Wang, "Solvent Dependence of the First Molecular Hyperpolarizability of *p*-Nitroaniline Revisited," *Journal of Physical Chemistry A*, **101** (11), 1989 (1997).
20. M. A. Pauley and C. H. Wang, "Poling Dynamics and Effects of Trapped Charges on Orientational Relaxation of Nonlinear Optical Chromophores in Amorphous Polymers," A poster presentation at the *National Meeting of the American Chemical Society*, Orlando, FL, August 1996.
21. M. A. Pauley, H. W. Guan, C. H. Wang and Alex K.-Y. Jen, "Determination of First Hyperpolarizability of Nonlinear Optical Chromophores by Second Harmonic Scattering using an External Standard," An oral presentation at the *National Meeting of the American Physical Society*, St. Louis, MO, March 1996.
22. M. A. Pauley, C. H. Wang and Alex K.-Y. Jen, "Poling Dynamics and Effects of Trapped Charge in Poled Polymer Films for Nonlinear Optical Applications," *Macromolecules*, **29** (22), 7064 (1996).
23. O. K. Song, M. A. Pauley and C. H. Wang, "Surface Enhanced Raman Spectroscopic Studies of Tricyanovinylthiophene in Silver Colloid Solution," *Journal of Raman Spectroscopy*, **27** (9), 685 (1996).
24. M. A. Pauley, H. W. Guan and C. H. Wang, "Poling Dynamics and Investigation into the Behavior of Trapped Charges in Poled Polymer Films for Nonlinear Optical Applications," *Journal of Chemical Physics*, **104** (17), 6834 (1996).
25. M. A. Pauley, H. W. Guan and C. H. Wang, "Determination of First Hyperpolarizability of Nonlinear Optical Chromophores by Second Harmonic Scattering using an External Standard," *Journal of Chemical Physics*, **104** (20), 7821 (1996).
26. M. A. Pauley and C. H. Wang, "Hyper-Rayleigh Scattering Studies of First Order Hyperpolarizability of Tricyanovinylthiophene Derivatives in Solution," *Journal of Chemical Physics*, **102** (16), 6400 (1995).
27. H. W. Guan, M. A. Pauley, T. Brett and C. H. Wang, "Investigation of Dipolar Reorientation Dynamics of Pure Bulk Polymers Using Second Harmonic Generation," *Journal of Polymer Science, Part B., Polymer Physics*, **32**, 2615 (1994).

Other Publications

1. Deitel & Associates, Inc., Mark A. Pauley and Daniel Quest, *Laboratory Manual to Accompany C++ How to Program, 2nd Edition*, Pearson Custom Publishing, Boston (2002) (ISBN 0-536-66753-5).
2. Deitel & Associates, Inc., Mark A. Pauley and Daniel Quest, *Laboratory Manual to Accompany C++ How to Program*, Pearson Custom Publishing, Boston (2000) (ISBN 0-536-62095-4).

Book Reviews

1. Herbert Schildt. *C++: A Beginner's Guide, 2nd Edition*. New York: McGraw-Hill, 2003.
2. *A Building Approach to C++ and Object Oriented Programming*. New York: McGraw-Hill
3. C. Thomas Wu. *An Introduction to Object-Oriented Programming with Java, 4th Edition*. New York: McGraw-Hill, 2005.
4. Robert Sedgewick and Kevin Wayne. *Introduction to Programming (in Java)*, Boston: Addison-Wesley, 2007.