

Curriculum Vitae, Nils G. Walter, Dr. rer. nat.

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PERSONAL DATA

Date of Birth: August 4, 1966
Place of Birth: Frankfurt, Germany (now permanent resident of the US)
Residence: 2030 Yeoman Court, Ann Arbor, MI 48103, USA
Marital Status: Married, two children

PROFESSIONAL EXPERIENCE

FACULTY

2010-present Director, Single Molecule Analysis in Real-Time (SMART) Center, University of Michigan
2009-present Professor of Chemistry
2005-2009 Associate Professor of Chemistry
2006 Sabbatical Visitor, Harvard University, with Sunney Xie in Chemistry & Chemical Biology
2006 Distinguished Visitor, JILA, Boulder, with David Nesbitt
2002-2005 Dow Corning Assistant Professor of Chemistry
1999-2005 Assistant Professor of Chemistry
1999-present Member of the Biophysics (since 1999), Applied Physics (since 2000), Cellular & Molecular Biology (since 2001), and Chemical Biology (since 2005) Interdepartmental Graduate Programs University of Michigan, Ann Arbor

POSTDOCTORATE

1996-1999 Postdoctoral Research Fellow with **Prof. John M. Burke**, University of Vermont; Subject: *Biophysical Studies of the Hairpin Ribozyme*
1995 Postdoctoral Research Fellow with Nobel laureate **Prof. Manfred Eigen**, Max-Planck-Institute for Biophysical Chemistry, Göttingen; Subject: *Applications of Fluorescence Correlation Spectroscopy*

EDUCATION

1992-1995 Graduate Research Assistant with Nobel laureate **Prof. Manfred Eigen**, Max-Planck-Institute for Biophysical Chemistry, Göttingen; Dr. rer. nat. Thesis: *Studies on Molecular in vitro Evolution using Non-Radioactive Detection of Nucleic Acids*; Grade: *Summa cum laude (highest possible)*; awarded an *Otto-Hahn Medal 1995 of the Max-Planck-Society*
1991 Diploma Thesis with **Prof. Hans-Günther Gassen**, Institute of Biochemistry, Technical University of Darmstadt; Subject: *Physicochemical and Enzymological Characterization of a NAD⁺-dependent Sorbitol Dehydrogenase from Gluconobacter oxydans ssp. suboxydans Strain M 1377*
1988-1991 Diploma in Chemistry, Major in Biochemistry, Technical University of Darmstadt, Germany; Grade: *Summa cum laude (highest possible)*; awarded with *Anton Keller Prize for best Chemistry Diploma of the Year*
1986-1988 Pre-Diploma in Chemistry, Technical University of Darmstadt, Germany

FELLOWSHIPS, HONORS, AND GRANTS

FELLOWSHIPS AND HONORS

- 2013 Imes and Moore Faculty Award, College of Literature, Science & the Arts, University of Michigan
- 2013 Faculty Recognition Award, University of Michigan
- 2012 Alexander von Humboldt Foundation Visiting Scholar, Johann Wolfgang Goethe University Frankfurt (Harald Schwalbe group)
- 2011 Election as AAAS Fellow
- 2011 Selection into the ADVANCE Program for Executive Leadership of the College of LS&A, University of Michigan
- 2011 Buchanan Lecturer, Bowling Green State University
- 2009-2013 Chartered NIH Study Section Member, MSFB
- 2006 Visiting Scholar, Harvard University (Sunney Xie group)
- 2006 Alumnus of the Year Award, Sherbrooke RiboClub
- 2006 JILA Distinguished Visitor Fellowship (David Nesbitt group)
- 2004 Camille Dreyfus Teacher-Scholar Award
- 2002 Dow Corning Assistant Professorship of the University of Michigan
- 1996 Otto-Hahn medal 1995 for Outstanding Researchers of the Max-Planck Society
- 1995-1998 Feodor-Lynen Postdoctoral Research Fellowship from the Alexander von Humboldt Foundation
- 1995 Summa cum laude Dr. rer. nat. graduate, Technical University Darmstadt and the Max-Planck-Institute for Biophysical Chemistry
- 1992-1994 Kekulé Pre-doctoral Scholarship from the Fonds of the German Chemical Industry Association
- 1991 Summa cum laude Chemistry graduate of the Technical University of Darmstadt, Anton Keller Prize for best Chemistry Diploma
- 1989-1991 Fellowship from the German National Merit Foundation ("Studienstiftung des deutschen Volkes")
- 1985 Book prize for best Final Examination (Abitur) of 1985 in secondary school

GRANTS, PRESENT

- 1/1/01-6/30/15: NIH 2R01 GM062357 (PI: Walter); total cost over 4 years: \$1,348,417; *Unraveling folding and mechanism of a small model ribozyme*; current year direct cost to Walter lab: \$180,340; provides full indirect costs
- 2/1/12-11/30/15: NIH 1R01 GM098023 (PI: Walter); total cost over 4 years: \$1,269,396; *Spliceosome Mechanism Dissected at the Single Molecule Level*; current year direct cost to Walter lab: \$178,243; provides full indirect costs
- 9/1/14-11/30/15: NIH 1R01 GM098023-S1 (PI: Walter); total cost over 1-¹/₄ years: \$98,812; Collaborative Supplement *High-Throughput Probing of Intron Secondary Structure Within Active Spliceosomal Complexes*; provides full indirect costs
- 12/15/13-11/30/15: NIH 1R21 AI109791 (PI: Walter); total cost over 2 years: \$384,863; *HCV biology and inhibition visualized at the single molecule level*; current year direct cost to Walter lab: \$135,000; provides full indirect costs
- 8/1/12-7/31/17: US Department of Defense MURI, ONR award W911NF-12-1-0420 (co-PI: Walter; PI: Hao Yan, Arizona State U.); total cost: \$6,250,000; *Translating Biochemical Pathways to Non-Cellular Environment*; current year direct cost to Walter lab: \$162,000; provides full indirect costs
- 1/1/13-12/31/14: University of Michigan MCubed grant (co-PI with Yiorgo Skiniotis); total cost over 2

- years: \$60,000; *DNA origami scaffolds for cryo-EM visualization of membrane associated complexes*; current year direct cost to Walter lab: \$30,000; provides no indirect costs
- 4/1/12-3/31/16: NIH 2 R01 GM063162 (PI: Joseph Wedekind); total cost over 4 years: \$1,472,944; *Mechanism of Action of Non-Coding RNA Molecules*; current year direct cost to Walter lab: \$36,620; provides full indirect costs
- 1/1/11-12/31/14: NIH 5 R01 GM055387 (PI: Carol Fierke); total cost over 4 years: \$1,203,447; *Enzymology of RNA Processing*; current year direct cost to Walter lab: \$7,636; provides full indirect costs
- 6/1/11-8/31/15: University of Michigan Rackham Graduate School (co-PI with John Wolfe, Anna Mapp, Bart Bartlett, Eitan Geva); *Enhancing Diversity in Graduate Education Grant award to Chemistry department*; Total cost over 3 years: \$155,500; *Student Diversity in Chemistry*; provides no indirect costs

GRANTS, PAST

- 9/1/99: Startup Funds University of Michigan: \$495,000
- 1/1/00-12/31/01: Rackham Graduate School grant (PI: Walter): \$15,000; *Relating Structure and Function in Catalytic RNA using Fluorescence Resonance Energy Transfer (FRET)*
- 5/1/01-8/31/01: University of Michigan Office of the Vice President of Research – Spring/Summer Research Grant Program (PI: Walter): Total cost: \$4,000; *How Single Ribosomes Fold and Function: An Atomic Force Microscopy Study*
- 3/29/02: University of Michigan OVPR (Office of the Vice President of Research); Distinguished Faculty and Graduate Student Seminar (PI: Walter): Total cost: \$6,500; *Chemistry Symposium*
- 5/23/02: University of Michigan OVPR (Office of the Vice President of Research), OPIL (Optical Physics Interdisciplinary Laboratory), and College of Literature, Science and Arts, Faculty grant (PI: Walter); Total cost: \$81,000; *Building a Single-Molecule Fluorescence Microscope to Study Structure, Dynamics, and Function of Biological Macromolecules*
- 1/1/03-12/31/03: NIH Grant Supplement 1 R01 GM62357-03S2 for equipment supplement to build a 17-node dual-processor PC cluster (PI: Walter); Total cost \$30,184; in support of *Folding and Function of the Hammerhead and Delta Ribozymes*
- 5/1/03-8/31/03: University of Michigan Office of the Vice President of Research – Spring/Summer Research Grant Program (PI: Walter): Total cost: \$4,000; *How Single Ribozymes Fold and Function: A Single-Molecule Spectroscopy Study*
- 6/1/03-11/1/03: OPIL (Optical Physics Interdisciplinary Laboratory) summer student support grant: \$4,000; *Observe and control the folding of single RNA molecules*
- 9/1/02-8/31/04: ACS-PRF Type G Grant # 37728-G7 (PI: Walter); Total cost over 2 years: \$35,000; *How Single Ribosomes Fold to Function: An Atomic Force Microscopy Study*
- 9/1/02-8/31/04: UNCF/Merck Science Initiative Fellowship (student: Dinari Harris; PI: Nils Walter); Total cost over 2 years: \$40,000; *Fluorescence Studies of Catalytic RNA*
- 1/1/03-12/31/04: OPIL (Optical Physics Interdisciplinary Laboratory) grant (co-PI: Jens-Christian Meiners); Total cost: \$19,500; *Combining optical detection of tethered single RNA molecules with microfluidic handling of buffer solutions*

- 9/1/03-12/31/04: NIH Grant Supplement 1 R01 GM62357-03S1 for minority student Rebecca Tinsley (PI: Walter); Total cost over 2¹/₄ years (original grant): \$124,399; in support of *Folding and Function of the Hammerhead and Delta Ribozymes*
- 9/1/02-8/31/05: Endowment associated with the Dow Corning Assistant Professorship; Total cost: \$50,000
- 7/1/03-6/30/06: NASA Bioscience & Engineering Institute Grant NNC04AA21A to the University of Michigan (PI: James Grothberg, School of Engineering); Total cost over 5 years: \$6,500,000; Subproject: *Single Molecule Biosensors and Actuators* (one of 12 total; co-PI with Jens-Christian Meiners)
- 6/1/04-5/31/06: NASA National Space Biomedical Research Institute Grant NNA04CD01G, managed by NASA's Fundamental Space Biology Program (co-PI with Jens-Christian Meiners); Total cost over 2 years: \$299,696; *Microfluidic Single-Molecule Biosensor*
- 1/1/01-12/31/06: NIH 1 R01 GM62357-01 (PI: Walter); Total cost over 5 years: \$1,110,218; *Folding and Function of the Hammerhead and Delta Ribozymes*; currently under one-year no-cost extension while submitting renewal application
- 9/1/04-8/31/09: Camille Dreyfus Teacher-Scholar Award from The Camille and Henry Dreyfus Foundation, Inc.; Total cost: \$60,000; *Probing the Mechanism of Small Interfering RNAs (siRNAs) by Single-Molecule Fluorescence Spectroscopy*; current year direct cost to Walter lab: \$12,000; provides no indirect costs
- 9/1/05-08/31/09: NSF Collaborative Research: Chemical Bonding Center (co-PI with several investigators in Columbia, Caltech, U. of Chicago, U. of New Mexico), award 0533019; Total cost over 4 years to the Walter group: \$239,400; *Center for Molecular Cybernetics*; current year direct cost to Walter lab: \$58,000; competitive renewal into Phase II recommended for funding; provides full indirect costs
- 12/1/05-11/30/10: NIH 2 R01 GM037006-17A1 (co-PI with Michael Morris); Total cost over 4 years: \$1,031,111; *Real-time Fluorescence Imaging of RNA/Ribosome Dynamics*
- 1/1/06-8/31/08: PRF Type AC Grant 43875-AC4 (PI: Walter), American Chemical Society; Total cost over 2-²/₃ years: \$80,000; *Catalysis by a Large Non-Protein Biopolymer: Dissecting VS Ribozyme Folding, Structure, and Mechanism using Single Molecule Fluorescence and Crystallography*
- 5/1/10-8/31/10: University of Michigan Office of the Vice President of Research – Spring/Summer Research Grant Program (PI: Walter); Total cost: \$6,000; *miP-Seq as a sensitive high-throughput technique to validate and quantify all microRNA targets*; provides no indirect costs
- 09/18/09-04/30/11: NIH 3R01GM062264-08S1 (Supplement to Jon Staley, U. Chicago); Total cost over funding period to the Walter lab: \$64,933 (\$48,025 direct costs + \$16,908 facilities and administrative costs); *Mechanisms for Rearranging RNA during Pre-mRNA Splicing*
- 7/1/07-8/31/11: NIH 2R01 GM062357-10A2 (PI: Walter); total cost: \$1,073,709; *U-turn of the Hepatitis Delta Virus Ribozyme*; current year direct cost to Walter lab: \$184,500; provides full indirect costs; was awarded competitive renewal to start 9/1/11
- 9/1/08-8/31/11: NSF Collaborative Research: EMT/MISC (co-PI with several investigators in Columbia, Caltech, U. of Chicago, U. of New Mexico), award CCF-0829579; Total cost over 3 years to the Walter group: \$330,000; *Behavior-Based Molecular Robotics*; current year direct cost to Walter lab: \$71,000; provides full indirect costs

- 10/01/09-04/30/12: NIH 3-R01-GM062357-S1 (Supplement to NIH 2R01 GM062357) (PI: Walter); total cost: \$152,758; *U-turn of the Hepatitis Delta Virus Ribozyme*; Diversity on Health-Related Research supplement for Ms. Kamali Sripathi; provides full indirect costs
- 1/01/12-8/31/12: NIH 3-R01-GM062357-S2 (Supplement to NIH 2R01 GM062357) (PI: Walter); total cost: \$41,034; *Unraveling folding and mechanism of a small model ribozyme*; Diversity on Health-Related Research supplement for Mr. Assefa Berhane; provides full indirect costs; remaining funds returned to NIH
- 5/1/12-4/30/13: NSF MCB-1240634 conference support; Total cost: \$8,700; *Conference: 17th Annual RNA Society Meeting to be held May 29-June 3, 2012; University of Michigan in Ann Arbor*; provides no indirect costs
- 8/1/07-7/31/12: NIH 1R01 GM081025 (PI: Walter); total cost over 4 years: \$1,000,673; *Trekking with the Ribosome: Single Molecule Microscopy of Intracellular miRNPs*; current year direct cost to Walter lab: \$175,000; provides full indirect costs
- 9/1/09-8/31/13: NSF EFRI-BioSA (co-PI with Ronald Larson, Chemical Engineering, as well as Jay Guo, Nick Kotov and James Baker Jr.), award 0938019; Total cost over 4 years to the Walter group: \$449,396; *Engineering Synthetic Mimics of DNA-Protein Recognition Systems*; current year direct cost to Walter lab: \$77,978; provides full indirect costs
- 2/15/10-9/30/13: NSF MRI-R2-ID (PI: Walter), award DBI-0959823; Total cost over 3 years, used to found the Single Molecule Analysis in Real-Time (SMART) Center at the U-of-M: \$1,700,026 (including \$537,000 university cost share); *MRI-R2: Development of High-Resolution Single Fluorescent Particle Tracker and Nanomanipulator*; provides partial indirect costs
- 1/1/13-12/31/13: IFOM Fondazione Istituto FIRC di Oncologia Molecolare, Milan, Italy (Sponsor: Fabrizio D'Adda di Fagagna), *Mechanism of DDRNAs*; Total cost 12 months: \$46,696; includes 30% indirect costs

GRANTS, PENDING

MANY

FELLOWSHIPS OF CURRENT STUDENTS

Mr. Xin Su, China Scholarship Council Fellowship

PROFESSIONAL ORGANIZATIONS

Member, Society of German Chemists (GDCh), since 1991
 Member, Society for Biochemistry and Molecular Biology (GBM), since 1993
 Member, RNA Society, since 1996
 Member, American Chemical Society, since 1999
 Member, American Association for the Advancement of Science, since 1999
 Member, Biophysical Society, since 2002

CONSULTING AND OTHER PROFESSIONAL ACTIVITIES

Editorial Advisory Board member of *Methods* (since 2013)
 Associate Editor, *Wiley Interdisciplinary Reviews (WIREs): Nanomedicine and Nanobiotechnology* (since 2010)
 Editorial Advisory Board member of Versita Open Access Books program in Chemistry (since 2012)
 Associate Editor, *Biopolymers* (since 2007)
 Organizer, Principles of Single Molecule Techniques Course 2014, October 13th – 14th, 2014, Ann Arbor, MI, USA
 Co-Organizer, 2nd Midwest Single Molecule Workshop, July 26th – 27th, 2012, Ann Arbor, MI, USA
 Lead Organizer, 17th RNA Society meeting, May 29th – June 3rd, 2012, Ann Arbor, MI, USA
 Co-Organizer, 16th International Conference on Luminescence, June 26th – July 1st, 2011, Ann Arbor, MI, USA
 Lead Organizer, Single Molecule Symposium, May 18th – 19th, 2006, Ann Arbor, MI, USA
 Organizer, MI RNA Society meeting 2002, Ann Arbor, MI, USA
 Guest editor of a volume of *Chemical Reviews* on *Single molecule imaging and mechanics: seeing and touching molecules one at a time* (2014)
 Guest editor of an issue of *Methods* on *RNA dynamics* (2009) and one on *RNA-related Methods* (2013)
 Section editor of Springer's *Encyclopedia of Biophysics* on *Single Molecule Tools* (2012)
 Guest editor of two volumes of *Methods in Enzymology* on *Single Molecule Tools* (2010)
 Editor (together with co-editors Sarah Woodson, Johns Hopkins U., and Rob Batey, U. Colorado at Boulder) of a book in Springer's *Series in Biophysics* on *Non-protein coding RNAs* (2009)
 Guest editor for *PLoS Computational Biology* (2009)
 Scientific Advisor for faculty search committee of King Abdullah University of Science and Technology (KAUST)
 Scientific Advisor, DNA Software (Ann Arbor, since 2007)
 Scientific Advisory Board, Q-RNA, Inc. (New York, since 2002)
 Chartered Member, MSFB Study Section, Oct 2009-June 2013

PUBLICATIONS (CURRENTLY 150, IN CHRONOLOGICAL ORDER)

1. **Walter, N.*** and Steiner, C. (1993) Fast chemiluminescent measurement of T7 RNA polymerase activity based on photon counting technology. *Biotechniques* **15**, 926-931.
2. **Walter, N.G.*** and Steiner, C. (1994) Fast quantification of chemiluminescent dot blot membranes using a filter adapter in a microplate luminometer: Application to polymerase activity assays. *J. Biolum. Chemilum.* **9**, 302.
3. **Walter, N.G.*** and Strunk, G. (1994) Strand displacement amplification as an *in vitro* model for rolling-circle replication: Deletion formation and evolution during serial transfer. *Proc. Natl. Acad. Sci. USA* **91**, 7937-7941.
4. **Walter, N.G.*** and Steiner, C. (1994) Screening for polymerase activities by fast quantification of chemiluminescent dot blot membranes using a filter adapter in a photon counting microplate luminometer. In *Bioluminescence and Chemiluminescence: Fundamentals and Applied Aspects*, pp. 83-86 (A. Campbell, L. Kricka and P. Stanley, eds.), John Wiley & Sons, Chichester.
5. Schober, A.*, **Walter, N.G.**, Tangen, U., Strunk, G., Ederhof, T., Dapprich J. and Eigen, M. (1995) A multichannel PCR and serial transfer machine as a future tool in evolutionary biotechnology. *Biotechniques* **18**, 652-660.
6. **Walter, N.*** (1995) Untersuchung molekularer *in vitro*-Evolution mit Hilfe nicht-radioaktiver Detektion von Nukleinsäuren. *Cuvillier Verlag*, Göttingen.
7. **Walter, N.G.*** (1995) Modelling viral evolution *in vitro* using exo⁻ Klenow polymerase: Continuous selection of strand displacement amplified DNA that binds an oligodeoxynucleotide to form a triple-helix. *J. Mol. Biol.* **254**, 856-868.

8. Schwille, P.*, Oehlenschläger, F. and **Walter, N.G.** (1996) Quantitative hybridization kinetics of DNA probes to RNA in solution followed by diffusional fluorescence correlation spectroscopy. *Biochemistry* **35**, 10182-10193.
9. **Walter, N.G.**, Schwille, P. and Eigen, M.* (1996) Fluorescence correlation analysis of probe diffusion simplifies quantitative pathogen detection by PCR. *Proc. Natl. Acad. Sci. USA* **93**, 12805-12810.
10. **Walter, N.G.** and Burke, J.M.* (1997) Real-time monitoring of hairpin ribozyme kinetics through base-specific quenching of fluorescein-labeled substrates. *RNA* **3**, 392-404.
11. Dapprich, J.*, **Walter, N.G.**, Salingue, F. and Staerk, H. (1997) Base-dependent pyrene fluorescence used for in-solution detection of nucleic acids. In Proceedings of the 4th International Conference on Methods and Applications of Fluorescence Spectroscopy (D. Birch and J. Miller, eds.), *J. Fluorescence* **7**, 87S-89S.
12. **Walter, N.G.**, Albinson, E. and Burke, J.M.* (1997) Probing structure formation in the hairpin ribozyme using fluorescent substrate analogs. *Nucleic Acids Symp. Ser.* **36**, 175-177.
13. Preuß, R., Dapprich, J. and **Walter, N.G.*** (1997) Probing RNA-protein interactions using pyrene-labeled oligodeoxynucleotides: Q β replicase efficiently binds replicable RNAs by recognizing pyrimidine residues. *J. Mol. Biol.* **273**, 600-613.
14. **Walter, N.G.** and Burke, J.M.* (1998) The hairpin ribozyme: structure, assembly and catalysis. *Curr. Opin. Chem. Biol.* **2**, 24-30.
15. **Walter, N.G.**, Hampel, K.J., Brown, K.M. and Burke, J.M.* (1998) Tertiary structure formation in the hairpin ribozyme monitored by fluorescence resonance energy transfer. *EMBO J.* **17**, 2378-2391.
16. Esteban, J.A., **Walter, N.G.**, Kotzorek, G., Heckman, J.E. and Burke, J.M.* (1998) Structural basis for heterogeneous kinetics: Reengineering the hairpin ribozyme. *Proc. Natl. Acad. Sci. USA* **95**, 6091-6095.
17. Murray, J.B.*, Seyhan, A.A., **Walter, N.G.**, Burke, J.M.* and Scott, W.G. (1998) The hammerhead, hairpin and VS ribozymes are catalytically proficient in monovalent cations alone. *Chem. Biol.* **5**, 587-595.
18. Hampel, K.J., **Walter, N.G.** and Burke, J.M.* (1998) The solvent-protected core of the hairpin ribozyme-substrate complex. *Biochemistry* **37**, 14672-14682.
19. Ederhof, T., **Walter, N.G.** and Schober A.* (1998) On-line polymerase chain reaction (PCR) monitoring. *J. Biochem. Biophys. Meth.* **37**, 99-104.
20. **Walter, N.G.**, Burke, J.M. and Millar, D.P.* (1999) Stability of hairpin ribozyme tertiary structure is governed by the interdomain junction. *Nat. Struct. Biol.* **6**, 544-549.
21. Porschke, D.*, Burke, J.M. and **Walter, N.G.** (1999) Global structure and flexibility of hairpin ribozymes with extended terminal helices. *J. Mol. Biol.* **289**, 799-813.
22. Pinard, R., Lambert, D., **Walter, N.G.**, Heckman, J.E., Major, F. and Burke, J.M.* (1999) Structural basis for the guanosine requirement of the hairpin ribozyme. *Biochemistry* **38**, 16035-16039.
23. **Walter, N.G.** and Burke, J.M.* (2000) Fluorescence assays to study structure, dynamics, and function in RNA and RNA-ligand complexes. *Methods Enzymol.* **317**, 409-440.
24. **Walter, N.G.***, Yang, N. and Burke, J.M.* (2000) Probing non-selective cation binding in the hairpin ribozyme with Tb(III). *J. Mol. Biol.* **298**, 539-555.
25. **Walter, N.G.***, Chan, P.A., Hampel, K.J., Millar, D.P. and Burke, J.M. (2001) A base change in the catalytic core of the hairpin ribozyme perturbs function but not domain docBlanking. *Biochemistry* **40**, 2580-2587.

26. Pinard, R., Lambert, D., Heckman, J.E., Esteban, J.A., Gundlach, C.W., Hampel, K.J., Glick, G.D., **Walter, N.G.**, Major, F. and Burke, J.M.* (2001) The hairpin ribozyme substrate binding-domain: A highly constrained D-shaped conformation. *J. Mol. Biol.* **307**, 51-65.
27. Fay, M.J., **Walter, N.G.*** and Burke, J.M.* (2001) Imaging of single hairpin ribozymes in solution by atomic force microscopy. *RNA* **7**, 887-895.

The following publications originate from independent work since arriving at Michigan:

28. Todorov, T.I., Carmejane, O., **Walter, N.G.*** and Morris, M.D.* (2001) Capillary electrophoresis of RNA in dilute and semi-dilute polymer solutions. *Electrophoresis* **22**, 2442-2447.
29. **Walter, N.G.*** (2001) Structural dynamics of catalytic RNA highlighted by fluorescence resonance energy transfer. *Methods* **25**, 19-30.
30. Pereira, M.J.B., Harris, D.A., Rueda, D. and **Walter, N.G.*** (2002) The reaction pathway of the trans-acting hepatitis delta virus ribozyme: a conformational change accompanies catalysis. *Biochemistry* **41**, 730-740.
31. **Walter, N.G.***, Harris, D.A., Pereira, M.J.B. and Rueda, D. (2002) In the fluorescent spotlight: global and local conformational changes of small catalytic RNAs. *Biopolymers* **61**, 224-242.
32. Zhuang, X., Kim, H., Pereira, M.J.B., Babcock, H.P., **Walter, N.G.*** and Chu, S.* (2002) Coupling of structural dynamics and function in single ribozyme molecules. *Science* **296**, 1473-1476.
33. Harris, D.A., Rueda, D. and **Walter, N.G.*** (2002) Local conformational changes in the catalytic core of the trans-acting hepatitis delta virus ribozyme accompany catalysis. *Biochemistry* **41**, 12041-12051.
34. **Walter, N.G.*** and Engelke, D.* (2002) Ribozymes: Catalytic RNAs that cut things, make things, and do odd and useful jobs. *The Biologist* **49**, 199-203.
35. Sekella, P.T., Rueda, D. and **Walter, N.G.*** (2002) A biosensor for theophylline based on fluorescence detection of ligand-induced hammerhead ribozyme cleavage. *RNA* **8**, 1242-1252.
36. **Walter, N.G.*** (2003) Probing RNA structural dynamics and function by fluorescence resonance energy transfer. *Curr. Protoc. Nucleic Acid Chem.*, **Chapter 11.10**, pp. 11.10.1-11.10.23.
37. Harris, D.A. and **Walter, N.G.*** (2003) Probing RNA structure and metal-binding sites using terbium footprinting. *Curr. Protoc. Nucleic Acid Chem.*, **Chapter 6.8**, pp. 6.8.1-6.8.8.
38. Jeong, S., Sefcikova, J., Tinsley, R.A., Rueda, D. and **Walter, N.G.*** (2003) The trans-acting HDV ribozyme: catalytic core and global structure are dependent on the 5' substrate sequence. *Biochemistry* **42**, 7727-7740. Bokinsky, G., Rueda, D., Misra, V.K., Gordus, A., Rhodes, M.M., Babcock, H.P., **Walter, N.G.*** and Zhuang, X.* (2003) Single-molecule transition-state analysis of RNA folding. *Proc. Natl. Acad. Sci. USA* **100**, 9302-9307. [Highlighted in Science Concentrates of C&E News July 21, 2003]
40. Rueda, D., Wick, K., McDowell, S.E. and **Walter, N.G.*** (2003) Diffusely bound Mg²⁺ ions orient stems I and II of the hammerhead ribozyme to increase the probability for formation of the catalytic core. *Biochemistry* **42**, 9924-9936.
41. Tinsley, R.A., Harris, D.A. and **Walter, N.G.*** (2003) Significant kinetic solvent isotope effects in folding of the catalytic RNA from the hepatitis delta virus. *J. Am. Chem. Soc.* **125**, 13972-13973.
42. Uhler, S.A., Cai, D., Man, Y., Figge, C. and **Walter, N.G.*** (2003) RNA degradation in cell extracts: Real-time monitoring by fluorescence resonance energy transfer (FRET). *J. Am. Chem. Soc.* **125**, 14230-14231.
43. Rueda, D., Bokinsky, G., Rhodes, M.M., Rust, M.J., Zhuang, X.* and **Walter, N.G.*** (2004) Single-

molecule enzymology of RNA: Essential functional groups impact catalysis from a distance. *Proc. Natl. Acad. Sci. USA* **101**, 10066-10071. [Highlighted as UM News Release June 29, 2004]

44. Tinsley, R.A., Harris, D.A. and **Walter, N.G.*** (2004) Magnesium dependence of the amplified conformational switch in the trans-acting hepatitis delta virus ribozyme. *Biochemistry* **43**, 8935-8945.
45. Harris, D.A., Tinsley, R.A. and **Walter, N.G.*** (2004) Terbium-mediated footprinting probes a catalytic conformational switch in the antigenomic hepatitis delta virus ribozyme. *J. Mol. Biol.* **341**, 389-403.
46. Hoerter, J.A.H., Lambert, M.N., Pereira M.J.B. and **Walter, N.G.*** (2004) Dynamics inherent in helix 27 from *Escherichia coli* 16S ribosomal RNA. *Biochemistry* **43**, 14624-14636.

The following publications originate from work performed after obtaining tenure:

47. Harris, D.A. and **Walter, N.G.*** (2005) Terbium(III) footprinting as a probe of RNA structure and metal-binding sites. In *Handbook of RNA Biochemistry Vol. 1*, pp. 205-213 (R.K. Hartmann, A. Bindereif, A. Schön, and E. Westhof, eds.), Wiley-VCH Verlag, Weinheim.
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148. Shankar, S., Malik, R., Kothari, V., Hosono, Y., Pitchiaya, S., Kalyana-Sundaram, S., Yocum, A., Escara-Wilke, J., Gundlapalli, H., Chinnaswamy, K., Shuler, M., Poliakov, A., Wang, X., Krishnan, V., White, Y., Firestone, A., Cao, X., Dhanasekaran, S.M., Stuckey, J., Bollag, G., Shannon, K., **Walter, N.G.**, Kumar-Sinha, C. and Chinnaiyan, A.M.* (2015) RAS engages AGO2 to enhance cellular transformation. *Cancer Discov.*, under review.
149. Rinaldi, A.J., Blanco, M.R., Lund, P.E. and **Walter, N.G.*** (2015) The Shine-Dalgarno sequence of riboswitch-regulated single mRNAs shows ligand-dependent accessibility bursts. *Nat. Chem. Biol.*, under review.
150. Liberman, J.A., Suddala, K.C., Aytenfisu, A.H., Chan, D., Belashov, I.A., Salim M., Mathews, D.H., Spitale, R.C., **Walter, N.G.** and Wedekind, J.E.* (2015) Structural analysis of a class 3 preQ₁ riboswitch reveals how an atypical pseudoknot controls translation using ligand-induced dynamics. *Nat. Struct. Mol. Biol.*, under review.
151. Marek, M.S. and **Walter, N.G.*** (2015) Multifactorial origin and suppression of heterogeneous folding of RNA, in preparation.

Several additional publications are currently in review or preparation.

* denotes corresponding author.

PATENTS AND DISCLOSURES OF INVENTION

1. Katherine Korbiak Jordan, Jens-Christian Meiners and **Nils G. Walter** (2007) Microfluidic single-molecule theophylline-specific biosensor based on a microarray platform. *Disclosure of Invention and New technology*, filed with NASA.
2. Yunbo Guo, Theodore B. Norris, James R. Baker, Lingjie Jay Guo and **Nils G Walter** (2011) Photonic crystal-metallic structures and applications. *Recorded with the United States patent and trademark office*.
3. Alexander Johnson-Buck, Mario Blanco, Arlie Rinaldi and **Nils G. Walter** (2014) **UM-33976/US-2/PRO**, Detection of nucleic acids. *Disclosure of Invention and New technology*, filed through the University of Michigan's Office of Technology Transfer.

INVITED SPEAKING ENGAGEMENTS

1. Seminar, April, 3rd, 1994, Department of Microbiology and Molecular Genetics, University of Vermont, Burlington, VT, USA.
2. Seminar, April, 4th, 1994, Department of Molecular Biology, Massachusetts General Hospital, Boston, MA, USA.
3. Seminar, April, 6th, 1994, Department of Molecular Biology and Biochemistry, Rockefeller University, New York, NY, USA.
4. Seminar, April, 12th, 1997, Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT, USA.
5. Seminar, October 3rd, 1997, Department of Molecular Biology, Scripps Research Institute, La Jolla, CA, USA.
6. Seminar, January 13th, 1999, Department of Chemistry, University of Michigan, Ann Arbor, MI, USA.
7. Seminar, January 22nd, 1999, Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University, Ames, IA, USA.
8. Seminar, April 8th, 1999, Biophysics Research Division, University of Michigan, Ann Arbor, MI, USA.
9. Seminar, April 21st, 1999, Department of Molecular Biophysics, Albert Einstein College of Medicine, New York City, NY, USA.
10. Platform talk at the Michigan RNA Society Meeting, September 25th, 1999, Ann Arbor, MI, USA.
11. Platform talk at the Rust Belt RNA Meeting, November 4th – 5th, 1999, Mt. Sterling, OH, USA.
12. Seminar, March 24th, 2000, Biology Department, University of Michigan, Flint, MI, USA.
13. Seminar, April 6th, 2000, Physics Department, Applied Physics Program, University of Michigan, Ann Arbor, MI, USA.
14. Seminar, April 11th, 2000, Biophysics Research Division, University of Michigan, Ann Arbor, MI, USA.
15. Seminar, July 12th, 2000, Chemistry Department, Stanford University, Stanford, CA, USA.
16. Seminar, October 26th, 2000, Department of Chemistry and Biochemistry, Middlebury College, Middlebury, VT, USA.
17. Seminar, October 27th, 2000, Department of Chemistry, College of the Holy Cross, Worcester, MA, USA.
18. Seminar, November 15th, 2000, Chemistry Department & Center for Photochemical Sciences, Bowling Green State University, Bowling Green, OH, USA.
19. Seminar, February 21st, 2001, Chemistry Department, Oakland University, Rochester, MI, USA.

20. Seminar, February 26th, 2001, Chemistry Department, Peking University, Beijing, China.
21. Invited talk at the RNA Society Meeting, May 29th - June 3rd, 2001, Banff, Alberta, Canada.
22. Invited talk at the Michigan RNA Society Meeting, September 29th, 2001, Wayne State University, Detroit, MI, USA.
23. Seminar, December 17th, 2001, Department of Biochemistry and Molecular Biophysics, Columbia University, New York City, NY, USA.
24. Seminar, April 5th, 2002, Department of Chemistry, Michigan Technological University, Houghton, MI, USA.
25. Seminar, May 2nd, 2002, Alumni Advisory Council Department of Chemistry, University Michigan, Ann Arbor, MI, USA.
26. Invited talk at the RNA Society Meeting, May 28th - June 2nd, 2002, Madison, WI, USA.
27. Seminar, July 11th, 2002, Center for RNA Molecular Biology, Case Western Reserve University, Cleveland, OH, USA.
28. Invited short talk at the Biochemical Society Focused Meeting/EMBO Workshop, August 23rd – 27th, 2002, Dundee, Scotland, UK.
29. Seminar, February 4th, 2003, Departments of Microbiology & Molecular Genetics and Biochemistry, Michigan State University, Lansing, MI, USA.
30. Seminar, May 19th, 2003, Department of Physics, University of Illinois Urbana-Champaign, IL, USA.
31. Invited talk and Session Chair for “Single Molecule Studies” at the Gordon Research Conference “Nucleic Acids” 2003, June 1st - 6th, 2003, in Newport, RI, USA.
32. Seminar, June 10th, 2003, Department of Biochemistry and Molecular Biology, University of Chicago, Chicago, IL, USA.
33. Invited talk at “Albany 2003, The 13th Conversation” 2003, June 17th – 21st, 2003, in Albany, NY, USA.
34. Invited talk at the RNA Society Meeting, July 1st - July 6th, 2003, Vienna, Austria.
35. Seminar, July 14th, 2003, Department of Cellular Biochemistry, Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany.
36. Invited talk at the Mechanism of RNA Processing session of the Biological Chemistry Division, 226th ACS National Meeting, September 7th - 11th, 2003, New York City, NY, USA.
37. Seminar, September 10th, 2003, Department of Chemistry and Biochemistry, University of Colorado at Boulder, Boulder, CO, USA.
38. Seminar, September 30th, 2003, Dow Corning Corporation, Midland, MI, USA.
39. Seminar, October 10th, 2003, Biophysics Research Division and Department of Chemistry, University of Michigan, Ann Arbor, MI, USA
40. Seminar, February 9th, 2004, Beckman Institute for Advanced Science and Technology, University of Illinois Urbana-Champaign, Urbana-Champaign, IL, USA.
41. Seminar, March 5th, 2004, Department of Chemistry, University of Indiana at Bloomington, Bloomington, IN, USA.
42. Seminar, April 9th, 2004, Department of Chemistry and Biochemistry, University of California San Diego, San Diego, CA, USA.

43. Lunch seminar, April 14th, 2004, Biophysics Research Division, University of Michigan, Ann Arbor, MI, USA.
44. Seminar, April 23rd, 2004, Department of Biochemistry, Duke University, Durham, NC, USA.
45. Invited talk at the RNA Society Meeting, June 1st – 6th, 2004, Madison, Wisconsin, USA.
46. Invited talk at the Gordon Research Conference “Nucleic Acids” 2004, June 6th - 11th, 2004, in Newport, RI, USA.
47. Invited talk at the Biophysical Chemistry and Novel Imaging of Single Molecules and Single Cells Symposium of the Physical Chemistry Division, 228th ACS National Meeting, August 22nd - 26th, 2004, Philadelphia, PA, USA.
48. Seminar, September 10th, 2004, Department of Chemistry, Pennsylvania State University, University Park, PA, USA.
49. Seminar, September 13th, 2004, Department of Biophysics, Johns Hopkins University, Baltimore, MD, USA.
50. Invited talk at the “Aptamers in Analysis” Symposium at the FACSS Meeting, October 3rd - 7th, 2004, Portland, OR, USA.
51. Seminar, October 25th, 2004, Department of Chemistry, University of Rochester, Rochester, NY, USA.
52. Seminar, November 30th, 2004, Department of Chemistry, University of California Davis, Davis, CA, USA.
53. Seminar, December 3rd, 2004, Department of Chemistry, University of Zürich, Switzerland, USA.
54. Seminar, January 19th, 2005, Department of Chemistry, Wayne State University, Detroit, MI, USA.
55. Invited talk at the Gordon Research Conference “Magnesium in Biochemical Processes & Medicine” 2005, February 6th - 11th, 2005, in Ventura, CA, USA.
56. Seminar, March 2nd, 2005, Department of Chemistry, University of Minnesota, Minneapolis, MN, USA.
57. Seminar, March 23rd, 2005, Department of Chemistry, Bowling Green State University, Bowling Green, OH, USA.
58. Seminar, April 5th, 2005, Department of Chemistry, Allegheny College, PA, USA.
59. Invited talk at “Albany 2005, The 14th Conversation” 2005, June 14th – 18th, 2005, in Albany, NY, USA.
60. Seminar, October 20th, 2005, Department of Chemistry, Andrews University, MI, USA.
61. Seminar, October 25th, 2005, Department of Biochemistry, University of Colorado Health Sciences Center, CO, USA.
62. Invited talk at the Biophysical Society meeting 2006, February 18th – 22nd, 2006, in Salt Lake City, UT, USA.
63. Seminar, February 22nd, 2006, Department of Biochemistry and Biophysics, University of California San Francisco, CA, USA.
64. Talk and Chair of organizing committee at the symposium “At the Single Molecule Frontier: Integration into Biology and Nanotechnology”, May 18&19th, 2006, University of Michigan, Ann Arbor, MI, USA.
65. Invited talk at the Gordon Research Conference “Single Molecule Approaches to Biology”, June 18-23, 2006, Colby-Sawyer College, New London, NH, USA.
66. Seminar, August 15th, 2006, JILA/University of Colorado, Boulder, CO, USA.

67. Seminar, September 15th, 2006, Department of Biochemistry, Biophysics discussion series, Brandeis University, MA, USA.
68. Seminar, September 21st, 2006, Department of Physics, Northeastern University, MA, USA.
69. Seminar, September 22nd, 2006, Department of Biochemistry, University of Vermont, VT, USA.
70. Invited “Alumnus of the Year award” talk at the Opening Session of the Sherbrooke Ribo-Club 2006, September 25-27, 2006, Magog, Quebec, Canada.
71. Seminar, October 30th, 2006, Department of Biochemistry & Molecular Pharmacology, University of Massachusetts Medical School, Worcester, MA, USA.
72. Invited talk at the Nanobiotech World Congress, Nov 16-17, 2006, Boston, MA, USA.
73. Seminar, December 5th, 2006, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
74. Seminar, December 18th, 2006, Ambion Inc./Applied Biosystems, Austin, TX, USA.
75. Seminar, February 8th, 2007, Biology Student Club, University of Michigan, Ann Arbor, MI, USA.
76. Seminar, March 23th, 2007, seminar in Astrobiology Lecture Series (organized by Biology and Astronomy Student Clubs), University of Michigan, Ann Arbor, MI, USA.
77. Two invited talks at the Division of Physical Chemistry’s “Single Molecule Spectroscopy, Imaging and Manipulation of Biomolecular Systems” and Division of Computers in Chemistry’s “Protein-Nucleic Acid Interactions: Experimental and Modeling Analysis” sessions, 234th ACS National Meeting, August 19th - 23rd, 2007, Boston, MA, USA.
78. Invited talk at the 27th Midwest Enzyme Chemistry Conference (MECC), Sept 29th, 2007, Chicago, IL, USA.
79. Seminar, January 24th, 2008, Society of Biology Students, University of Michigan, Ann Arbor, MI, USA.
80. Seminar, February 12th, 2008, Department of Chemistry, SUNY Albany, Albany, NY, USA.
81. Seminar, February 13th, 2008, Applied Physics Program, University of Michigan, Ann Arbor, MI, USA.
82. Seminar, February 25th, 2008, Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany.
83. Seminar, February 28th, 2008, Department of Chemistry, University of Frankfurt, Frankfurt, Germany.
84. Seminar, March 11th, 2008, Department of Biological Sciences, SUNY Albany, Albany, NY, USA.
85. Invited talk at the American Society of Biochemistry and Molecular Biology (ASBMB) meeting, April 5th - 8th, 2008, San Diego, CA, USA.
86. Seminar, April 23rd, 2008, Chemistry department staff, University of Michigan, Ann Arbor, MI, USA.
87. Seminar, October 1st, 2008, Chemistry Department, Bowling Green State University, Bowling Green, OH, USA.
88. Seminar, October 10th, 2008, Department of Chemistry, University of Michigan, Ann Arbor, MI, USA.
89. Seminar, October 23rd, 2008, Department of Chemistry and Biochemistry, UT Austin, Austin, TX, USA.
90. Seminar, December 5th, 2008, Department of Chemistry, Purdue University, West Lafayette, IN, USA.
91. Invited talk at the Telluride workshop on “RNA Dynamics”, July 27th-31st, 2009, Telluride, CO, USA.
92. Invited talk at the Gen-AU project cluster workshop, September 24th-25th, 2009, Innsbruck/Seefeld, Austria.

93. Seminar, October 21st, 2009, Department of Chemistry, Oakland University, Rochester, MI, USA.
94. Invited talk at the Symposium on Watching Biomolecules in Action (WBMA'09), December 15th-17th, Osaka, Japan.
95. Seminar, February 19th, 2010, Department of Chemistry, Albion College, Albion, MI, USA.
96. Seminar, February 22nd, 2010, Nanobiology Certificate seminar series, University of Michigan, Ann Arbor, MI, USA.
97. Seminar, March 9th, 2010, Department of Biological Sciences, Western Michigan University, Kalamazoo, MI, USA.
98. Seminar, April 21nd, 2010, Department of Chemistry, Ohio State University, Columbus, OH, USA.
99. Invited talk at the Telluride workshop on "Toward understanding of phosphoryl transfer in protein and RNA: experiments and computations", June 14th-18th, 2010, Telluride, CO, USA.
100. Invited talk at the Midwest Single Molecule Workshop, July 26th-27th, 2010, St. Louis, MO, USA.
101. Seminar, September 3rd, 2010, Department of Chemistry, Jackson State University, Jackson, MS, USA.
102. Seminar, October 18th, 2010, BioMolecular Markers seminar, Department of Chemistry, University of Cincinnati, Cincinnati, OH, USA.
103. Seminar, November 5th, 2010, Department of Chemistry, Saint Louis University, Saint Louis, MI, USA.
104. Seminar, March 11th, 2011, Chemistry-Biology Interface Training Grant Symposium, University of Michigan, Ann Arbor, MI, USA.
105. Buchanan lecture, April 19th & 20th, 2011, Departments of Biology, Chemistry and Physiology, Bowling Green State University, Bowling Green, OH, USA.
106. Invited talk at the RNA Society Meeting, June 14th – 19th, 2011, Kyoto, Japan.
107. Seminar, June 20th, 2011, Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University, Kyoto, Japan.
108. Invited talk at the Division of Physical Chemistry's symposium "From Ultrafast Electron Transfer to Single Molecule Spectroscopy: Forces Driving Contemporary Themes in Physical Chemistry", 242nd ACS Meeting, Aug 28th – Sept 1st, 2011, Denver, CO, USA.
109. Seminar, September 2nd, 2011, Department of Biochemistry, University of Missouri Medical School, Columbia, MO, USA.
110. Seminar, November 2nd, 2011, Department of Biochemistry, University of Rochester Medical School, Rochester, NY, USA.
111. Seminar, January 24th, 2012, Department of Molecular & Cell Biology, University of California Berkeley, Berkeley, CA, USA.
112. Seminar, January 25th, 2012, Bay Area RNA Club, held at University of California San Francisco, California, CA, USA.
113. Seminar, February 20th, 2012, Department of Molecular Biology and Biochemistry, Simon Fraser University, British Columbia, Canada.
114. Seminar, March 2nd, 2012, Institute of Organic Chemistry and Chemical Biology & DFG-SFB 902 "Molecular principles of RNA-based regulation", Johann Wolfgang Goethe University Frankfurt, Frankfurt, Germany.
115. Seminar, May 2nd, 2012, Department of Chemistry, Rice University, Houston, TX, USA.

116. Seminar, May 8th, 2012, Department of Biology, University of North Carolina, Chapel Hill, NC, USA.
117. Seminar, June 15th, 2012, Department of Chemistry and Biochemistry, Lise-Meitner Kolloquium, Free University of Berlin, Berlin, Germany.
118. Seminar, June 18th, 2012, Department of Chemistry, Heinrich-Heine University Düsseldorf, Düsseldorf, Germany.
119. Seminar, June 22nd, 2012, Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany.
120. Seminar, June 25th, 2012, Rudolph-Boehm-Institute for Pharmacology and Toxicology, University of Leipzig, Leipzig, Germany.
121. Seminar, June 26th, 2012, Medical Faculty, Graduiertenkolleg GRK1591, Martin-Luther-University Halle-Wittenberg, Halle, Germany.
122. Seminar, June 28th, 2012, Department of Biology, Technical University of Darmstadt, Darmstadt, Germany.
123. Seminar, July 3rd, 2012, Department of Chemistry, University of Konstanz, Konstanz, Germany.
124. Seminar, July 5th, 2012, Institute for Biochemistry, Genetics and Microbiology, Sonderforschungsbereich 960 "Ribosome Formation", University of Regensburg, Regensburg, Germany.
125. Seminar, July 9th, 2012, Department of Chemistry, GDCh-Kolloquium, Technical University of Dortmund, Dortmund, Germany.
126. Seminar, July 11th, 2012, LIMES-Institute, Life and Medical Sciences Bonn, Rheinische Friedrich-Wilhelms University Bonn, Bonn, Germany.
127. Seminar, July 12th, 2012, Institute for Biochemistry, DFG-SFB 858 "Synergistic Effects in Chemistry – From Additivity Towards Cooperativity", Westfälische Wilhelms University of Münster, Münster, Germany.
128. Seminar, July 13th, 2012, Helmholtz Zentrum München, Department of Physics/TU München and DFG-SFB 863 "Forces in Biomolecular Systems", Technical University of Munich, Munich, Germany.
129. Workshop, August 27th & 29th, 2012, "From Ensemble to Single Molecule Fluorescence: Conformational Changes and Super-resolved Movement", Biocenter, Johann Wolfgang Goethe University Frankfurt, Frankfurt, Germany.
130. Seminar, Oct 12th, 2012, Department of Chemistry, University of Missouri, Columbia, MO, USA.
131. Seminar, Oct 17th, 2012, The Exposure Series-PechaKucha, University of Michigan, MI, USA.
132. Seminar, Oct 24th, 2012, Department of Chemistry, Louisiana State University, Baton Rouge, LA, USA.
133. Seminar, Oct 25th, 2012, Department of Chemistry, Xavier University, New Orleans, LA, USA.
134. Seminar, Jan 30th, 2013, Applied Physics seminar, University of Michigan, MI, USA.
135. Seminar, Mar 5th, 2013, Department of Chemistry and Biochemistry, Biophysics program, University of Maryland, College Park, MD, USA.
136. Seminar, May 23rd, 2013, Department of Biochemistry and Molecular Biology, University of Texas Medical Branch, Galveston, TX, USA.
137. Invited talk at the Gordon Research Conference "Nucleic Acids" 2013, June 2nd-7th, 2013, University of New England, Biddeford, Maine, USA.
138. Seminar, Jun 10th, 2013, SEMMinar program, iFOM-IEO, Milan, Italy.

139. Invited talk at the RNA Society Meeting, June 11th – 16th, 2013, Davos, Switzerland.
140. Invited talk at the 1st Korea Symposium on “Current Trends in Biophysics”, Aug 11th-14th, 2013, Korea Institute for Advanced Study, Seoul, South Korea.
141. Seminar, Oct 11th, 2013, Department of Chemistry and Biochemistry, University of Notre Dame, South Bend, IN, USA.
142. Seminar, Oct 18th, 2013, Department of Physics, Center for the Physics of Living Cells, University of Illinois at Urbana-Champaign, Urbana, IL, USA.
143. Seminar, Nov 6th, 2013, Department of Pharmaceutical Sciences, University of Michigan, Ann Arbor, MI, USA.
144. Seminar, Nov 8th, 2013, Department of Chemistry and Biochemistry, Arizona State University, Tempe, AZ, USA.
145. Seminar, Jan 23rd, 2014, Seminar to the Biology Student Alliance, University of Michigan, MI, USA.
146. Seminar, Feb 22nd, 2014, Seminar to the Rackham Diversity Faculty Allies, University of Michigan, MI, USA.
147. Invited talk at Pittcon in session “Spectrochemical Analysis of Biological Systems - A Perspective from New and Established Investigators” 2013, March 2nd-6th, 2014, Chicago, IL, USA.
148. Seminar, Mar 5th, 2014, Department of Biochemistry and Molecular Biology, University of Chicago, Chicago, IL, USA.
149. Seminar, Mar 18th, 2014, Seminar at the Rackham Chairs and Directors Meeting, University of Michigan, MI, USA.
150. Seminar, Mar 22nd, 2014, Department of Physics – Saturday Morning Physics, University of Michigan, Ann Arbor, MI, USA.
151. Seminar, Mar 31st, 2014, Department of Physics, Michigan State University, East Lansing, MI, USA.
152. Seminar, Apr 4th, 2014, Department of Chemistry and Biochemistry, UC Santa Cruz, Santa Cruz, CA, USA.
153. Seminar, Jul 14th, 2014, Regional Centre of Advanced Technologies and Materials, Palacký University, Olomouc, Czech Republic.
154. Seminar, Oct 3rd, 2014, Department of Chemistry, Penn State University, College Park, PA, USA.

RESEARCH GROUP

Current Graduate Students (denotes minority student)*

Ms. Elizabeth Cameron	from 5/1/14 (Chemistry student from 9/13)
Mr. Corey Custer	from 5/1/12 (Chembio IDP student from 9/11)
Mr. Matthew Kahlscheuer	from 5/1/10 (Chemistry student from 9/09)
Ms. Jieming Li	from 5/1/14 (Chemistry student from 9/13)
Mr. Paul Lund	from 5/1/11 (Chembio IDP student from 9/10)

Former Graduate Students

Dr. John Androsavich	9/1/07 – 8/31/12	Chemical Biology student, now scientist at Regulus Therapeutics, San Diego
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Mr. Berhane(gebriel) Assefa *	9/1/11 – 8/31/12	PIBS/CMB student
Mr. Garrette Belanger	5/1/00 – 2/1/02	Chemistry student, now PharmD
Dr. Mario Blanco *	9/1/07 – 5/30/13	PIBS/CMB student, now postdoctoral fellow with Mitch Guttman at Caltech
Dr. Erika Cline	9/1/08 – 5/30/13	PIBS/CMB student, graduated
Dr. Chamaree de Silva	5/1/04 – 5/1/09	Biophysics student, now Visiting Assistant Professor in Physics at Mercer University
Dr. Mark Ditzler	9/1/03 – 12/31/08	PIBS/Biophysics student, now physical research scientist with NASA Ames Research Center
Dr. Dinari Harris *	1/1/00 – 08/31/04	Chemistry student, first Damon-Runyan Postdoctoral Fellow w/ Richard Carthew at Northwestern U., now Laboratory of Molecular Biophysics at the NIH
Ms. Charity Haynes *	5/1/10 – 12/31/11	PIBS/Biophysics student
Dr. John Hoerter	9/1/02– 12/31/07	Chemistry student, first Irving S. Sigal Postdoctoral Fellow w/ Nicholas Gascoigne at the Scripps, then Postdoctoral Fellow at GNF in San Diego, now company scientist
Ms. Sohee Jeong	1/1/01 – 12/31/02	Chemistry student, switched graduate programs, then at Los Alamos National Labs
Dr. Alexander Johnson-Buck	5/1/08 – 12/31/12	Chemistry student, now postdoctoral fellow at Harvard Medical School
Dr. Ramya Krishnan	9/1/08 – 5/30/13	Chemistry student, graduated
Dr. Visha(lakshi) Krishnan	9/1/07 – 5/30/13	Chemistry student, now company adviser with SearchLite
Dr. Katherine Korbiak	9/1/02 – 12/31/07	joint Physics student with Jens-Christian Meiners/Physics, now graduated
Ms. Rachel Leslie	5/1/09 – 12/31/10	Chemical Biology student, left graduate program with Masters to work as Method Development Chemist, GOJO Industries in Akron, OH
Dr. Matthew Marek	9/1/07 – 08/31/14	PIBS/CMB student, graduated
Dr. Sarah (Liz) McDowell	5/1/03 – 08/31/08	Biophysics student, now Assistant Professor of Physics, Kalamazoo College
Dr. Nicole Michelotti	5/1/08 – 04/30/13	Physics student, now Postdoctoral Research Fellow with Timothy McKay/UM Physics
Dr. Miguel Pereira	9/1/03 – 05/1/09	Chemistry student, now Assistant Research Professor at New York U.
Dr. Sethu(ramasundaram) Pitchiaya	5/1/07 – 12/31/11	Chemistry student, now postdoctoral fellow with the Single Molecule Analysis in Real-Time (SMART) Center
Ms. Amy Predenkiewicz	1/1/04 – 12/31/04	CMB graduate student
Dr. Renata Afi Rawlings *	5/23/05 – 05/1/10	Biophysics student, then PENN PORT Program postdoctoral fellow w/ Sarah Tishcoff at U. Penn, now NSF liaison with White House Office of Science and Technology
Dr. Maria Rhodes	1/1/01 – 06/30/06	Chemistry student, graduated
Dr. Arlie Rinaldi	6/1/10 – 04/30/13	Chemistry student, now Visiting Assistant Professor of Chemistry in the Keck Science Department at Claremont McKenna College

Dr. Jana Sefcikova	5/1/01 – 06/30/06	Chemistry student, now postdoc w/ Penny Beuning at Northeastern U.
Dr. Kamali Sripathi *	7/1/09 – 04/30/14	Medicinal Chemistry student, now postdoc at Purdue University
Mr. Xin Su	9/1/13 – 09/30/14	visiting from Peking University as part his PhD
Dr. Krishna Suddala	7/1/09 – 04/30/14	PIBS/Biophysics student, now continuing as postdoc
Dr. Wendy Tay	7/1/10 – 04/30/14	Program in Chemical Biology student, now intern at Thompson-Reuter
Dr. Rebecca Tinsley *	9/1/02 – 05/31/05	Chemistry student, now Research Scientist at Colgate/Palmolive
Dr. Gabrielle Todd	6/1/08 – 12/31/11	Chemical Biology student, now postdoctoral fellow at SUNY Albany
Dr. Jennifer Willard Furchak	9/1/02 – 9/30/07	Chemistry student, graduated, now Associate Professor of Chemistry, Kalamazoo College
Ms. Sherry (Yue) Xie	5/1/12 – 8/31/13	Chemistry student, left group

Titles of Ph.D. theses completed in the Walter lab

- Dr. John Androsavich-- Diversity in intracellular microRNA regulatory networks: microRNA-21 and beyond
- Dr. Mario Blanco—Splicing at single molecule resolution: Pre-mRNA dynamics throughout spliceosome assembly and catalysis
- Dr. Erika Cline-- Interactions between nanoparticles and biological charged lines: biological mimics of protein-DNA complexes and microtubules as drug targets
- Dr. Mark Ditzler-- Folding and conformational dynamics of the hairpin ribozyme and the spliceosome: combining computational and experimental analyses
- Dr. Dinari Harris-- Conformational changes and metal-ion binding of the hepatitis delta virus ribozyme
- Dr. John Hoerter-- Dynamics, degradation, and chemical modification of non-coding RNA
- Dr. Alexander Johnson Buck-- Detection of stochastic and heterogeneous behaviors in DNA nanodevices by super-resolution fluorescence microscopy
- Dr. Sarah (Liz) McDowell-- Structure, function and dynamics of minimal and extended hammerhead ribozymes
- Dr. Ramya Krishnan-- Understanding Pre-mRNA Dynamics in Single Spliceosome Complexes
- Dr. Visha(lakshi) Krishnan-- An investigation of the RNA induced silencing complex and its therapeutic implications
- Dr. Matthew Marek-- Heterogeneous folding and function of small RNA motifs: The hairpin ribozyme and a translational riboswitch
- Dr. Miguel Pereira-- Single molecule characterization of the Varkud satellite ribozyme and bulk native purification of non-coding RNA
- Dr. Sethu(ramasundaram) Pitchiaya-- Probing microRNA activity *in vitro* and inside cells using single molecule microscopy
- Dr. Renata Afi Rawlings-- An *in vitro* and *in silico* kinetic study of a viral RNA silencing suppressor
- Dr. Maria Rhodes-- Formation and structural communication through an interdomain cavity in the catalytic core of the hairpin ribozyme
- Dr. Arlie Rinaldi-- Establishing ligand mediated RNA folding of translational riboswitches as genetic regulators using single molecule microscopy
- Dr. Jana Sefcikova-- Conformational dynamics in folding and function of the hepatitis delta virus ribozyme
- Dr. Kamali Sripathi-- Structural Dynamics of the Hepatitis Delta Virus and Hairpin Ribozymes: Implications for Function

- Dr. Krishna Suddala-- A Tale of Two Riboswitches: Single Molecule Investigation of the Conformation, Dynamics and Ligand binding to the PreQ1 and T-box Riboswitches
- Dr. Wendy Tay-- Structures, Dynamics, and Ribozymes: An Investigation of RNA Structural Dynamics with the Hepatitis Delta Virus and Hairpin Ribozymes
- Dr. Rebecca Tinsley Probing the structure-function relationship of two non-coding RNAs: the hepatitis delta virus ribozyme and glmS catalytic riboswitch
- Dr. Gabrielle Todd-- Secondary Structure of Bacteriophage T4 Gene 60 mRNA: Implications for Translational Bypassing
- Dr. Jennifer Willard Furchak-- Development of analytical assays for the detection of small molecules using aptazymes

Current Postdoctoral Fellows

Dr. Soma Dhakal	2/1/13 – present	Postdoctoral fellow
Dr. May Daher Farhat	12/1/12 – present	Postdoctoral fellow
Dr. Laurie Heinicke	1/1/13 – present	Postdoctoral fellow
Dr. Damon Hoff	1/1/13 – present	Postdoctoral fellow in the Single Molecule Analysis in Real-Time (SMART) Center
Dr. Xiang Li	9/1/14 – present	Postdoctoral fellow
Dr. Sethu Pitchiaya	1/1/12 – present	Postdoctoral fellow
Dr. Krishna Suddala	5/1/14 – present	Postdoctoral fellow
Dr. Julia Widom	1/10/14 – present	Postdoctoral fellow

Former Postdoctoral Fellows

Dr. John Androsavich	9/1/12 – 09/30/12	now Postdoctoral fellow Regulus Therapeutics, San Diego
Dr. Mario Blanco *	5/1/13 – 12/31/13	now Postdoctoral fellow with Mitch Guttman at Caltech
Dr. Kaushik Gurunathan	9/1/12 – 08/31/13	now Assistant Research Professor, SASTRA University, India
Dr. Cheng-Yen Huang	10/1/07 – 10/31/09	
Dr. Alexander Johnson-Buck	1/1/13 – 7/31/14	now postdoctoral fellow with William Shih at Harvard Medical School
Dr. Anthony Manzo	9/1/05 – 8/30/11	now Research Scientist, The Aerospace Corporation in El Segundo, CA
Dr. Sarah (Liz) McDowell	9/1/08 – 8/31/09	now Assistant Professor of Physics, Kalamazoo College
Dr. Meredith Newby	9/1/02 – 6/30/06	then Asst. Prof. of Physics, Clemson University
Dr. Shiamalee Perumal	8/1/07 – 5/31/08	now Applications Specialist at GE Healthcare
Dr. Arlie Rinaldi	5/1/13 – 09/30/13	now Visiting Assistant Professor of Chemistry in the Keck Science Department at Claremont McKenna College
Dr. David Rueda	8/1/01 – 8/31/05	now Chair (Full Professor) at Imperial College London
Dr. Kamali Sripathi *	5/1/14 – 7/25/14	now postdoctoral fellow in Chemical Education at Purdue University
Dr. Mohamed Sobhy	10/1/07 – 1/31/09	now postdoctoral fellow at KAUST
Dr. Catherine Summers	1/1/01 – 2/28/02	now at Sankyo Pharma, Inc.
Dr. Tristan Tabouillot	9/1/10 – 12/20/12	Senior Research Scientist of the Single Molecule

Dr. Gabrielle Todd	1/1/12 – 3/31/12	Analysis in Real-Time (SMART) Center now at UM Medschool w/ Akira Ono
Dr. Hannah Townsend	8/15/08 – 5/31/09	now postdoctoral fellow at UM's Medical School

Former Sabbatical Visitor

Dr. Christopher Rohlman (Biochemistry, Albion College)	1/1/06 – 7/31/06	
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Current Undergraduate Students

Ms. Rebecca Bartke	from 9/1/13	UROP student
Mr. Williams Dixon	from 9/1/11	UROP student
Ms. Qian Hou	from 6/1/14	Biochemistry student
Mr. Jun Park	from 9/1/13	Biochemistry student
Mr. David Smith	from 9/1/12	UROP student
Ms. Jerry Wong	from 1/1/13	Biochemistry student

Former Undergraduate Students (denotes minority student)*

Ms. Maria Agostini	1/1/13 – 6/30/14	Biochemistry student
Mr. Vivek Behera	1/1/09 – 6/1/10	Biochemistry honors thesis; now technician with Nobel laureate Carol Greider, John Hopkins
Ms. Kasia Chmielinska	6/4/03 – 11/1/03	German exchange student, FU Berlin; then graduate student TU Berlin
Ms. Katelyn Doxtader	9/1/10 – 06/31/14	UROP student
Ms. Brea Edwards *	6/2/14 – 8/1/14	SROP student
Mr. Ken Eng	10/1/06 – 05/31/07	UROP student
Mr. Hugo Espejel *	6/1/08 – 8/1/08	SROP summer student
Ms. Mary Falgout	6/1/01 – 8/7/01	REU summer student
Ms. Carina Figge	4/1/02 – 8/31/02	German exchange student, U. Bielefeld
Ms. Christina Galloway	1/1/09 – 5/1/10	Chemistry student
Ms. Melissa Gondert	1/1/04 – 5/31/05	Biochemistry honors thesis
Ms. Kristy Hamlin *	5/30/14 – 8/7/14	REU student
Ms. Kimberly Haupt	9/1/08 – 12/31/10	UROP student
Ms. Charity Haynes *	6/1/08 – 8/1/08	SROP summer student
Mr. Jesse Jun	9/1/07 – 5/1/09	Biochemistry honors thesis
Mr. Christopher Katanski	9/1/09 – 06/30/10	UROP student
Mr. Matthew Ko	1/1/14 – 05/30/14	work-study student
Mr. Sim Choon Kiat	7/15/04 – 12/31/04	Biophysics undergraduate
Ms. LeaAnn Love *	6/1/12 – 8/1/12	SROP summer student
Mr. Mariusz Matyszewski	1/1/12 – 5/1/13	Biophysics student
Ms. Eka Melani *	6/1/12 – 8/10/12	REU summer student
Mr. Simon Meyer	1/27/04 – 6/25/04	German exchange student, U. Regensburg
Ms. Michaela Möllmann	8/6/03 – 10/4/03	German exchange student, TU Munich
Mr. Khalil Mroue	1/1/10 – 5/31/11	Biochemistry student
Mr. James Patterson	6/1/05 – 8/10/05	REU summer student
Mr. Hai Pham	8/1/07 – 5/1/09	Biochemistry honors thesis
Ms. Anirudha Rathnam	10/1/07 – 4/30/08	UROP student
Ms. Stephanie Redemann	2/4/04 – 5/1/04	German exchange student, TU Darmstadt, then graduate student Cambridge U.
Ms. Maggie Rodgers	1/1/10 – 5/31/11	Biochemistry student

Mr. Kenneth Rodriguez *	6/1/00 – 8/1/00	SROP summer student, then Ph.D. student at USC
Ms. Melanie Sabbagh	09/1/08 – 9/1/09	Biochemistry undergraduate
Ms. Franziska Schorsch	8/1/02 – 2/28/03	German exchange student, U. Mainz
Mr. Frank Schulz	4/15/02 – 8/15/02	German exchange student, then Ph.D. student at MPI for coal research
Mr. Phillip Sekella	10/1/00 – 8/15/02	Biochemistry honors thesis, then Ph.D. student at U. Stanford
Ms. Hui Shan	6/1/01 – 12/31/01	Biophysics undergraduate, then Ph.D. student at MIT
Ms. Elizabeth Shy	11/1/09 – 12/31/10	Biochemistry honors thesis
Mr. Jesse Sinanan *	6/1/07 – 8/10/07	REU summer student
Mr. Benjamin Singer	5/1/00 – 10/30/00	Mathematics undergraduate, then graduate students Bioinformatics at UM
Mr. Jeremy Stocks *	6/1/13 – 8/1/13	SROP summer student
Ms. Saskia Thomas	6/4/03 – 11/1/03	German exchange student, FU Berlin
Ms. Sarah Uhler	5/1/01 – 6/1/03	Chemistry honors thesis, then M.D./Ph.D. student at UC San Francisco
Ms. Eva Vöcker	8/2/04 – 10/8/04	German exchange student, U. Bochum
Ms. Hanna Wagner	8/1/11 – 10/31/11	German exchange student, U. Freiburg
Ms. Katrin Wick	9/1/02 – 2/28/03	German exchange student, FU Fürtwangen, then at Concordia U. in Montreal
Ms. Anja Will	3/7/08 – 9/29/08	German exchange student, University of Technology Dresden
Mr. Delon Wilson *	6/1/02 – 8/15/02	REU summer student
Ms. Mona Wood	5/31/07 – 5/31/08	Biochemistry honors thesis, then M.D./Ph.D. student at UC Irvine
Ms. Yun Xie	6/1/03 – 8/31/03	Chemistry undergraduate, U. Michigan
Ms. Ying Qi Zhang	6/1/11 – 8/1/11	SROP summer student
Mr. Ang Zhou	7/5/10 – 8/31/10	China-REU

Former Research Assistants

Ms. Caitlin Marlatt	1/14/08 – 6/30/09	now Chemistry graduate student, Emory U.
Mr. Miguel Pereira	09/01/99 – 8/31/02	CMB graduate student at UC Berkeley for one year, then Chemistry student at UM, graduated

MAJOR FELLOWSHIPS AND AWARDS OF RESEARCH GROUP MEMBERS

Individual Fellowships or Awards

Dr. David Rueda	Postdoctoral research fellowship of the Swiss National Science Foundation; Dharmacon award for oral presentation at the Rustbelt RNA Meeting
Dr. Meredith Lambert	Ruth L. Kirschstein National Research Service Postdoctoral Fellowship; Michigan RNA Society Meeting Outstanding Poster Award; Seyhan Ege ADVANCE Travel Award
Dr. Mohamed Sobhy	Ruth L. Kirschstein National Research Service Postdoctoral Fellowship
Dr. Hannah Townsend	Ruth L. Kirschstein National Research Service Postdoctoral Fellowship
Mr. John Androsavich	Cellular Biotechnology Training Grant
Mr. Mario Blanco	Rackham Merit Fellowship, Maas/Deans Award of the PIBS program;

	Cellular & Molecular Biology Training Grant; Molecular Biophysics Training Grant; Rustbelt RNA Meeting top oral presentation award; CMB top poster presentation award; MI RNA Society Meeting top poster presentation award
Ms. Erika Cline	Cellular & Molecular Biology Training Grant
Mr. Corey Custer	GAANN fellowship
Mr. Mark Ditzler	Molecular Biophysics Training Grant
Mr. Dinari Harris	GEM Fellowship; Michigan Rackham Merit Fellowship; Molecular Biophysics Training Grant; United Negro College Fund/Merck Pre-Doctoral Fellowship; Wirt & Mary Cornwell Outstanding Graduate Student Research Award
Ms. Charity Haynes	Michigan SROP Summer Research Fellowship; Rackham Merit Fellowship
Mr. John Hoerter	Molecular Biophysics Training Grant; Eli Lilly Fellowship 2005-2006; Rackham One Term Dissertation Award; Irving S. Sigal Postdoctoral Fellowship from the ACS (only one awarded nationwide every two years)
Mr. Alexander Johnson-Buck	Molecular Biophysics Training Grant; PECRUM travel award; ACS Outstanding Graduate Student Award for Research & Teaching; Rackham Predoctoral Fellowship; Rackham Outstanding Graduate Student Instructor Award
Mr. Matthew Kahlscheuer	RNA Travel Award fellowship 2014; <i>Nature Reviews Molecular Cell Biology</i> poster award at the RNA Society meeting 2014
Ms. Ramya Krishnan	Best poster travel award at Vaughan symposium 2011
Ms. Rachel Leslie	Chemistry & Biology Interface Training Grant
Mr. Matthew Marek	Cellular & Molecular Biology Training Grant
Ms. Sarah (Liz) McDowell	Molecular Biophysics Training Grant; NSF Pre-Doctoral Fellowship
Ms. Nicole Michelotti	Microfluidics in Biomedical Sciences Training Grant
Mr. Miguel Pereira	Molecular Biophysics Training Grant; Florence Fenwick Outstanding GSI Award
Mr. Sethu Pitchiaya	Best poster travel award at Vaughan symposium 2011
Ms. Amy Predenkiewicz	Cellular & Molecular Biology Training Grant
Ms. Afi Rawlings	Ford Fellowship; Michigan Science Award Fellowship; Molecular Biophysics Training Grant; MI RNA Society top oral presentation award
Ms. Arlie Rinaldi	<i>Nature Structural & Molecular Biology</i> poster award of the RNA Society 2012
Ms. Maria Rhodes	Michigan Regents Fellowship; NSF Pre-Doctoral Fellowship
Ms. Jana Sefcikova	Margaret and Herman Sokol International Summer Research Fellowship; NATO Science Fellowship, Czech Republic; Center for the Education of Women Sarah Winans Newman Scholarship; Eli Lilly Fellowship 2004-2005; Rackham One Term Dissertation Award
Mr. Xin Su	China Scholarship Council Fellowship
Ms. Wendy Tay	pre- and post-candidacy NSERC scholarships
Ms. Rebecca Tinsley	Michigan Rackham Merit Fellowship; NIH Minority Supplement and predoctoral fellowship; 1 st prize oral presentation in the biosciences, Emerge Workshop 2005
<u>Undergraduates</u>	
Ms. Maria Agostini	Chemistry Summer Undergraduate Research Fellowship
Ms. Kasia Chmielinska	German DAAD Study Abroad Fellowship

Mr. William Dixon	Chemistry Summer Undergraduate Research Fellowship
Ms. Brea Edwards	Michigan SROP Summer Research Fellowship
Mr. Hugo Espejel	Michigan SROP Summer Research Fellowship
Ms. Mary Falgout	Michigan REU Summer Research Fellowship
Ms. Carina Figge	German DAAD Study Abroad Fellowship
Ms. Christina Galloway	ACS Outstanding Third-Year undergraduate student award
Ms. Melissa Gondert	Gomberg Summer Research Fellowship; Carlene Friedley Scholarship
Ms. Kristy Hamlin	Michigan REU Summer Research Fellowship
Ms. Qian Hou	Chemistry Summer Undergraduate Research Fellowship
Mr. Jesse Jun	Alumni Outstanding Award for 3 rd Year Student
Ms. Rachel Leslie	Chemistry & Biology Interface Training Grant
Mr. Jun Park	UROP Summer Undergraduate Research Fellowship
Mr. Kenneth Rodriguez	Michigan SROP Summer Research Fellowship
Mr. Frank Schulz	German DAAD Study Abroad Fellowship
Mr. Phillip Sekella	ACS Outstanding Senior Leadership Award; Summer Research Fellowship
Mr. Jesse Sinanan	Michigan REU Summer Research Fellowship
Ms. Saskia Thomas	German DAAD Study Abroad Fellowship
Ms. Sarah Uhler	Michigan Chemistry Department Alumni Fellow; Barry M. Goldwater Scholarship; Carlene Friedley Scholarship; AIC Chemistry Award; two consecutive Summer Research Fellowships
Ms. Katrin Wick	German DAAD Study Abroad Fellowship
Mr. Delon Wilson	Michigan REU Summer Research Fellowship
Ms. Jerry Wong	Chemistry Summer Undergraduate Research Fellowship
Ms. Mona Wood	2008 Merck Index Award, 2008 ACS Analytical Chemistry/Alumni Award

CURRENT COLLABORATIONS

- Professor Xiaowei Zhuang (Department of Chemistry and Chemical Biology, Harvard University) – single-molecule fluorescence spectroscopy
- Professor Richard Collins (Molecular and Medical Genetics, University of Toronto) – VS ribozyme
- Professor Peixuan Guo (Department of Veterinary Pathobiology, Purdue University) – Phi29 DNA packaging
- Dr. Traci Hall (Laboratory of Structural Biology, National Institute of Environmental Health Sciences, National Institutes of Health) – p19 protein from Carnation Italian ringspot virus
- Professor Anna Pyle (Department of Molecular Biophysics and Biochemistry, Yale University) – RNA helicases
- Dr. Jiří Šponer (Academy of Sciences of the Czech Republic, Brno, Czech Republic) – Molecular Dynamics (MD) simulations of RNA
- Professor Milan Stojanovic (Department of Medical Sciences, Columbia University) – Center for Molecular Cybernetics
- Professor Hashim Al-Hashimi (Department of Chemistry, University of Michigan) – NMR studies of RNA
- Professor Ioan Andricioaei (Department of Chemistry, University of Michigan) – Advanced Molecular

Dynamics (MD) simulation tools

- Professor Carol Fierke (Department of Chemistry, University of Michigan) – RNase P RNA
- Professor Jens-Christian Meiners (Department of Physics, University of Michigan), and Professor Robert Kennedy (Department of Chemistry, University of Michigan) – Combining single-molecule fluorescence spectroscopy with optical tweezers and microfluidics in the design of biosensors
- Professor Michael Morris (Department of Chemistry, University of Michigan) – Capillary electrophoresis and imaging of single RNA molecules
- Professor Sunney Xie (Department of Chemistry and Chemical Biology, Harvard University) – Single molecule microscopy of living cells
- Professor David Bartel (Department of Biology, MIT and Whitehead Institute) – miRNA-protein complex detection in living cells
- Professor Carl Correll (Department of Biochemistry and Molecular Biology, Rosalind Franklin University of Medicine and Science) – RNA-protein complex assembly
- Professor David Nesbitt (JILA/U. Colorado Boulder) – single molecule microscopy of quantum dots
- Professors John Abelson and Christine Guthrie (Department of Biochemistry and Biophysics, UC San Francisco) and Professor Reinhard Lührmann (MPI for Biophysical Chemistry, Germany) – single molecule splicing
- Professors Wedekind and Ermolenko (Department of Biochemistry and Biophysics, University of Rochester) and Professor Charlie Brooks (Biophysics and Department of Chemistry, University of Michigan) – riboswitches and ribozymes

SERVICE

Departmental Committees

Computer Committee	1999 – 2000
Gomberg Lecture Committee	1999 – 2005
Graduate Recruiting Committee	2000 – 2005; 2006 – 2008; 2012-ongoing (Chair)
Chemical Biology Search Committee	2000 (successfully hired Hashim Al-Hashimi)
Biophysics/Physics Search Committee	2000 (successfully hired Michal Zochowski)
Biophysics Admissions Committee	2000 – 2001, 2007 – 2009 (Chair)
Program in Biomedical Sciences Adm. Comm.	2000 – 2001
Analytical Chemistry Search Committee	2002 (successfully hired Kristina Hakansson)
Chemical Biology Seminar Coordinator	2002 – 2003 and 2004 – 2006
Curriculum Committee	2002 – 2005
Advisory Committee Chemistry Symposium	2002 – 2008
Chairman ADVANCE junior faculty forum	2003 – 2004
Mol. Biophysics Training Grant Seminar Coordinator	2003
Mol. Biophysics Training Grant Steering Committee	2003 – 2009
Biophysics/Chemistry Search Committee	2004 (successfully hired Jennifer Ogilvie)
Chemistry Long-range Planning Committee	2005 – 2008
Space Planning Committee	2005
Nanoscience Search Committee (joint with Physics)	2005 – 2006
Biophysics Curriculum Committee	2005 – 2007
Ad hoc (tenure promotion) committees	Hashim Al-Hashimi (promoted), Kicki Hakansson

Chemistry Search Committee	(promoted), Kevin Kubarych, Katrin Karbstein (Chair 2009-2010; then she moved to Scripps Florida), Julie Biteen (Chair 2010-ongoing) 2012 – 2013
Chemistry Admissions Committee	2001 – 2002; 2008; 2009 – 2011 (Chair); 2013 – ongoing
Chemistry Recruiting Committee	2013 – ongoing (Chair)
Rackham Diversity Faculty Ally	2012 – ongoing

Other Departmental Service

- As departmental Recruiting Committee Chair, I reinvigorated (at least doubled) our outreach seminar program to primarily undergraduate institutions and worked with LSA's videography group to develop a departmental recruiting video, now posted on YouTube.
- As departmental Rackham Diversity Ally, I have been responsible for diversity recruiting into the department since 2012. I raised funds from Rackham and, most notably, conceived and implemented a M-CORE (Michigan – Chemistry Opportunities for Research & Education) preview weekend to bring 12-13 students from undergraduate serving institutions and their mentors to campus each fall for recruiting into our summer internship and graduate programs. I am also a co-organizer of the NextProfScience Future Faculty Workshop in May 2015, with the goal to diversify science.
- As chairman of the Chemistry Admissions Committee I worked hard on securing a more even recruiting effort by reaching the targeted class size of 55-60 students (56 students will start this fall, compared to widely fluctuating numbers of 28 two years ago and 63 last year). I introduced three specific improvements to our admissions process: 1.) All student applications are available online to first the admissions committee members and later (for the admitted students) to the faculty as a whole; 2.) visiting students are assigned each one host from our current student pool; the feedback from the visitors and current students has been very positive; 3.) the admissions and recruiting committees work more closely together; for example, the recruiting committee generated a flash drive with information materials for the recruiting weekends (traditionally a domain of the admissions committee) and a brainstorm meeting was held 2 weeks after closure of the admissions season for wrap-up and collection of ideas for future improvements.
- Developed and set up a brochure and website for our Chemistry department Chemical Biology graduate program, Spring 2000
- Developed and set up a brochure and website for our Biophysics graduate program, Fall 2007
- Interviewed 42 Chinese students in Beijing for admission to our Chemistry graduate program (and additional 5 students for Biophysics) in February 2001; we offered admission to 9 and attracted 7 of these students into our program; planned and organized such a trip for the first time in the Chemistry department; coordinated with the Rackham Graduate School and the English Language Institute on this endeavor; thus initiated the first of our now annual recruiting trips to China
- Initiated regular biweekly social gatherings for students, staff, and faculty in the department, from 2001
- Helped group of graduate students apply for and implement the first annual Chemistry Symposium
- Currently serving or have served on ~60 graduate student dissertation committees
- Initiated the introduction of two new courses to our Biochemistry undergraduate curriculum: Chem 453 (Biophysical Chemistry I: Thermodynamics and Kinetics); Chem 454 (Biophysical Chemistry II: Macromolecular Structure and Dynamics); revamped Chem 451 (Advanced Biochemistry I); and co-

founded graduate level course Chem 505 (Nucleic Acid Biochemistry)

- Served as Marshal during Spring 2013 Commencement

Manuscript Reviewer for the Following Journals and Institutions

Account of Chemical Research
 Analytical Chemistry
 Biochemistry
 Biophysical Journal
 Biotechniques
 Cell
 Cellular and Molecular Life Sciences
 Chemical Communications
 Chemical Reviews
 Chemistry & Biology
 EMBO Journal
 FEBS Letters
 Inorganic Chemistry
 Journal of Molecular Biology
 Journal of the American Chemical Society
 Journal of Nanoscience and Nanotechnology
 Nature
 Nature Biotechnology
 Nature Chemical Biology
 Nature Communications
 Nature Methods
 Nature Nanotechnology
 Nature Structural and Molecular Biology
 Nucleic Acids Research
 Oligonucleotides
 Proceedings of the National Academy of Sciences of the USA
 RNA
 Scientific Reports (Nature)
 Stanford Synchrotron Radiation Lightsource
 W.M. Keck Foundation

External Service

- Reviewer for the UM's Rackham Graduate School of Rackham Merit Fellowships and Graduate Student Instructor awards
- Local Lead Organizer, RNA Society meeting 2012 at the University of Michigan, Ann Arbor
- Co-organizer of the Midwest Single Molecule Workshop 2012 at the University of Michigan, Ann Arbor
- Member, Membership Committee of the RNA Society, 2011-ongoing
- Served as regular member of the NIH MSFB study section, Oct 2009-2013; Ad Hoc reviewer on the NIH Biophysical Chemistry (BBCB) study section for the Oct. 21/22, 2004, session (was previously

asked to serve on the Biochemistry (BIO) study section, but declined); Ad Hoc reviewer on NIH study sections ZRG1 BCMB-K (40) P, SEP-ZGM1TRN-0, 2015/05 ZRG1 AARR-D (03) M

- Member, Research Policies Committee of the UM Senate Assembly (SACUA), 2009-2012
- Member, Admissions Committee of the Michigan Post-baccalaureate Research Education Program (PREP), 2011-ongoing
- Member, Data fraud inquiry committee for the Office of the Vice President of Research at the UM, 2008
- Chaired organizing committee of the symposium “At the Single Molecule Frontier: Integration into Biology and Nanotechnology”, May 18&19th, 2006, University of Michigan, Ann Arbor, MI, USA (raised \$50,000 for this purpose from intramural sources)
- Directing the UM Single Molecule Analysis in Real-Time (SMART) Center and chairing its Steering Committee, 2010-ongoing
- Co-organized the annual Pfizer-Chemistry symposium 2007, in conjunction with the departmental 150th birthday celebration
- Co-organized the MI RNA Society Meetings 2002 and 2007, as well as the PECRUM (Perspectives on Chemistry research at the University of Michigan) Symposium 2003
- Elected into the Executive Committee of the Optical Physics Interdisciplinary Laboratory (OPIL) at UM, 2003-2006
- Grant Reviewer for the NSF, both REU program (fall 2005) as well as numerous individual investigator grants
- Grant Reviewer for the University of Missouri-Kansas City Research Board, 1999
- Grant Reviewer for the Human Frontier Science Program, 2006
- Grant Reviewer for Research Corporation for Science Advancement, 2009
- External Honors examiner for three undergraduate theses at Oberlin College, 2014
- Grant Reviewer for the King Abdullah University of Science and Technology (KAUST), 2014

TEACHING

Department of Chemistry, University of Michigan, MI, USA

Chem 260: Chemical Principles for Undergraduate Students (W01, F01, F03, F04)

Department of Chemistry, University of Michigan, MI, USA

Chem 451: Biochemistry I for Undergraduate Students (F02, F09, F10, F11, W13, W14)

Department of Chemistry, University of Michigan, MI, USA

Chem 454: Biophysical Chemistry II for Undergraduate Students (W05, W06, W07, W08, W09)

Department of Chemistry, University of Michigan, MI, USA

Chem 480: Instrumental Analysis Lab for Undergraduate Students (F07)

Department of Chemistry, University of Michigan, MI, USA

Chem 495: Professional Development in the Chemical Sciences (W10, W11)

Chemical Biology Interdepartmental Graduate Program, University of Michigan, MI, USA

Chem 501: Chemical Biology I (F08, F09, F10, F12)

Cellular Biotechnology Training Program, University of Michigan, MI, USA
Biotech 504: Cellular Biotechnology (W02, W03)

Department of Chemistry, University of Michigan, MI, USA
Chem 455/505: Nucleic Acid Biochemistry (F09, F13, F14)

Department of Chemistry, University of Michigan, MI, USA
Chem 525: Chemical Biology I for Graduate Students (F00, F01, F02, F03)

Department of Chemistry, University of Michigan, MI, USA
Chem 526: Chemical Biology II for Graduate Students (W00, W01, W03)

Biophysics Graduate Program, University of Michigan, MI, USA
Biophys/Chem 521: Biophysical Chemistry II (W08, W09, W10)

Chemical Biology Interdepartmental Graduate Program, University of Michigan, MI, USA
Chem 601: Critical Reading (F05, F07, F08)

Chemical Biology Interdepartmental Graduate Program, University of Michigan, MI, USA
Chem 602: Critical Reading (W06)

Department of Chemistry, Technical University of Darmstadt, Darmstadt, Germany
Teaching Assistant in Physical Chemistry for Physics Undergraduates

POSTERS

1. **Walter, N.G.** "A strategy for the generation of a partly mutagenised library of sequences by random recombination and deletion/insertion within a sequence", presented at the EMBO Workshop on Molecular Repertoires and Methods of Selection, September 26th - October 1st 1993, in Gubbio, Italy.
2. **Walter, N.G.** and Steiner, C. "Fast quantification of chemiluminescent dot blot membranes using a filter adapter in a microplate luminometer: Application to polymerase activity assays", presented at the 8th Symposium on Bioluminescence and Chemiluminescence, September 5th - 8th 1994, in Cambridge, UK; abstract published in *J. Biolum. Chemilum.* **9** (1994) 302.
3. **Walter, N.G.** and Burke, J.M. "Fluorescence assays to study hairpin ribozyme kinetics", presented at RNA '96, the 1st annual meeting of The RNA Society, May 28th - June 2nd 1996, in Madison, WI, USA.
4. **Walter, N.G.** and Burke, J.M. "Tertiary structure formation in the hairpin ribozyme monitored by fluorescence resonance energy transfer (FRET)", presented at the RNA Structure Meeting, June 25th - June 29th 1997, in Santa Cruz, CA, USA.
5. **Walter, N.G.**, Bond, J.J., Hampel, K.J., Yang, N. and Burke, J.M. "The role and binding sites of metal ions in the hairpin ribozyme", presented at RNA '98, the 3rd annual meeting of The RNA Society, May 26th - June 1st 1998, in Madison, WI, USA.
6. **Walter, N.G.**, Millar D.P. and Burke, J.M. "Stability of hairpin ribozyme tertiary structure monitored by tr-FRET", presented at the Gordon Research Conference "Nucleic Acids" '98, June 21 - 26th 1998, in Newport, RI, USA.
7. **Walter, N.G.**, Chan, P.A., Hampel, K.J., Millar D.P. and Burke, J.M. "A native-like kinetic folding trap in the hairpin ribozyme", presented at RNA '99, the 4th annual meeting of The RNA Society, June 23th - 27th 1999, in Edinburgh, UK.
8. **Walter, N.G.**, Chan, P.A., Hampel, K.J., Millar D.P. and Burke, J.M. "A native-like kinetic folding trap in the hairpin ribozyme", presented at the Gordon Research Conference "Nucleic Acids" '99, July 4th - 9th 1999,

in Newport, RI, USA.

9. Fay, M.J., **Walter, N.G.** and Burke, J.M. "Direct visualization of docking of the hairpin ribozyme-substrate by atomic force microscopy", presented at the NARI'2K Conference "Novel Approaches in RNA Informatics" May 18th - 19th 2000, in Montreal, Quebec, Canada.
10. Pereira, M.J., Harris, D.A. and **Walter, N.G.** "Folding and function of synthetic hepatitis delta virus ribozymes", presented at RNA 2000, the 5th annual meeting of The RNA Society, May 30th – June 4th 2000, in Madison, WI, USA.
11. Zhuang, X., Chu, S. and **Walter, N.G.** "Folding of single hairpin ribozymes", presented at RNA 2000, the 5th annual meeting of The RNA Society, May 30th – June 4th 2000, in Madison, WI, USA.
12. Pereira, M.J., Harris, D.A., Hannemann, D.E. and **Walter, N.G.** "Folding and function of synthetic hepatitis delta virus ribozymes", presented at RNA Structure, July 12th – 16th 2000, in Santa Cruz, CA, USA.
13. Zhuang, X., Chu, S. and **Walter, N.G.** "Folding of single hairpin ribozymes", presented at RNA Structure, July 12th – 16th 2000, in Santa Cruz, CA, USA.
14. **Walter, N.G.**, Pereira, M.B., Zhuang, X., Chu, S. "Folding of single hairpin ribozymes", presented at RNA 2001, the 6th annual meeting of The RNA Society, May 29th – June 3th 2001, in Banff, Alberta, Canada.
15. **Walter, N.G.**, Pereira, M.B., Zhuang, X., Chu, S. "Folding of single hairpin ribozymes", presented at the Gordon Research Conference "Nucleic Acids" '01, June 24 - 29th 2001, in Newport, RI, USA.
16. Pereira, M.B., Harris, D.A., Shi, J. and **Walter, N.G.** "The reaction pathway of the hepatitis delta virus ribozyme: a conformational change accompanies catalysis", presented at the Gordon Research Conference "Nucleic Acids" '01, June 24 - 29th 2001, in Newport, RI, USA.
17. **Walter, N.G.**, Zhuang, X., Kim, H., Pereira, M.J.B., Babcock, H.P. and Chu, S. "Correlating structural dynamics and function in single ribozyme molecules", presented at the Biophysical Society meeting 2003, March 1 - 5th 2003, in San Antonio, TX, USA.
18. **Walter, N.G.**, Rueda, D., Rhodes, M.M., Bokinsky, G., Rust, M.J. and Zhuang, X. "Modifications remote from the catalytic site interfere with both folding and catalysis in single ribozymes: Evidence for coupled molecular motions in RNA", presented at the Biophysical Society meeting 2004, February 14 - 18th 2004, in Baltimore, MD, USA.
19. Uhler, S.A., Cai, D., Hoerter, J., Lambert, M., Predenkiewicz, A., Rawlings, R. and **Walter, N.G.** "Small Interfering (si)RNAs — Degradation in Cell Extracts and Binding by Proteins: Real-Time Monitoring by Fluorescence Resonance Energy Transfer (FRET)", presented at the 10th annual meeting of The RNA Society, May 24th – 29th 2005, in Banff, Alberta, Canada.

Posters presented by my coworkers (although highly valued of course) are not listed.