

# Curriculum Vitae, Nils G. Walter, Dr. Ing. (Chemistry)

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## PROFESSIONAL EXPERIENCE

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### FACULTY

- 2018 Sabbatical Visitor, Chan Zuckerberg Biohub, San Francisco
- 2017-present Francis S. Collins Collegiate Professor of Chemistry, Biophysics, and Biological Chemistry, College of Literature, Science and the Arts
- 2016-present Founding Co-Director, Center for RNA Biomedicine, U. of Michigan; awarded a 5-year \$10.2M Biosciences Initiative Award in 2018 to further build this grassroots, 150-faculty member effort
- 2016-present Professor of Biological Chemistry
- 2015-present Co-Director, Microfluidics in Biomedical Sciences Training Program
- 2015-present Associate Director, Michigan Post-baccalaureate Research Education Program (PREP)
- 2010-present Founding Director, Single Molecule Analysis in Real-Time (SMART) Center, U. 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

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- 1992-1995 Graduate Research Assistant with Nobel laureate **Prof. Manfred Eigen**, Max-Planck-Institute for Biophysical Chemistry, Göttingen; Dr. Ing. 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 Ing. Thesis with **Prof. Hans-Günther Gassen**, Institute of Biochemistry, Technical University of Darmstadt; Subject: *Physicochemical and Enzymological Characterization of a NAD<sup>+</sup>-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**

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**FELLOWSHIPS AND HONORS**

- 2018 Visiting Sabbatical Scholar, Chan-Zuckerberg Biohub, San Francisco (hosted by Stephen Quake)
- 2018 Prasanta Datta Memorial Scholarship from the Department of Biological Chemistry, University of Michigan, for sabbatical travel
- 2017 Francis S. Collins Collegiate Professor of Chemistry, Biophysics, and Biological Chemistry, College of Literature, Science and the Arts
- 2017 RNA Society Mid-Career Award 2017
- 2015 Jean Dreyfus Boissevain Lecturer 2015, Trinity University, San Antonio, TX
- 2015 Harold R. Johnson Diversity Service Award, University of Michigan
- 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 Sabbatical Scholar, Harvard University (Sunney Xie group)
- 2006 Alumnus of the Year Award, Sherbrooke RiboClub
- 2006 JILA Distinguished Visitor Fellowship (David Nesbitt group)
- 2004-2009 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**

- 1/1/01-12/31/19: NIH 2R01 GM062357 (PI: Walter); total cost over 4 years: \$1,512,054; *Riboswitch mechanism unraveled at the single molecule level*; current year direct cost to Walter lab: \$250,000; provides full indirect costs
- 1/1/16-12/31/19: NIH 3-R01-GM062357-14-A1-S1 (PI: Walter); total direct cost: \$248,778; *Administrative supplement for instrumentation: Riboswitch mechanism unraveled at the single molecule level*; provides full indirect costs
- 9/23/16-8/31/20: NIH R01 GM118524 (Walter); total cost to Walter lab over 4 years: \$1,215,224; Co-

- transcriptional folding of single riboswitches*; current year direct cost to Walter lab: \$197,500; provides full indirect costs
- 5/01/17-4/30/21: NIH R01 R01 GM122803 (Walter); total cost to Walter lab over 4 years: \$1,069,510; *Timing and coordination of the conformational rearrangements mediating splicing*; current year direct cost to Walter lab: \$190,000; provides full indirect costs
- 3/3/17-2/28/20: NIH R21 CA204560 (Walter); total cost to Walter lab over 3 years: \$413,333; *Single-molecule counting of cancer biomarker miRNAs in human biofluids*; current year direct cost to Walter lab: \$100,000; provides full indirect costs
- 9/1/18-8/31/21: NIH R33 CA229023 (Tewari, Walter); total cost to Walter lab over 3 years: \$582,556; *Optimization and Validation of Single-Molecule Kinetic Fingerprinting Technology for Rapid, Ultra-Specific Detection of Cancer Mutations*; current year direct cost to Walter lab: \$124,500; provides full indirect costs
- 6/1/16-3/31/20: NIH R01 GM115857 (Nikonowicz); total cost to Walter lab over 4 years: \$447,500; *Resolving structure and Mechanism of tRNA-actuated riboswitches*; current year direct cost to Walter lab: \$85,621; provides full indirect costs
- 9/1/16-8/31/19: NSF DMR-1607854 (Yan); total cost to Walter lab over 3 years: \$150,000; *Collaborative Research: A biomimetic dynamic self-assembly system programmed using DNA nanostructures*; current year direct cost to Walter lab: \$30,703; provides full indirect costs
- 2/12/18-2/11/19: Bio-Rad/Alight Science LLC (Walter); total cost to Walter lab over 1 year: \$246,336; *Proof-of-concept study on protein detection with SiMREPS assay*; current year direct cost to Walter lab: \$246,336; provides only partial 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 2<sup>1</sup>/<sub>4</sub> 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-<sup>2</sup>/<sub>3</sub> 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
- 1/1/13-12/31/14: University of Michigan MCubed grant (co-PI with PI Yiorgo Skiniotis and co-PI Roger Sunahara); 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
- 9/1/14-11/30/15: NIH 1R01 GM098023-S1 (PI: Walter); total cost over 1-<sup>1</sup>/<sub>4</sub> 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
- 1/1/11-12/31/15: 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

- 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; renewal pending
- 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
- 6/1/11-8/31/16: University of Michigan Rackham Graduate School (PI with co-PIs John Wolfe, Anna Mapp, Bart Bartlett, Eitan Geva); *Enhancing Diversity in Graduate Education Grant award to Chemistry department*; Total cost over 5 years: \$175,500; *Student Diversity in Chemistry*; provides no indirect costs
- 7/1/15-12/31/16: University of Michigan Mi-TRAC Kickstart grant (co-PI with Muneesh Tewari); total cost over 1 year: \$30,000; *A New Technology for Single Molecule Counting of Nucleic Acid Biomarker*; current year direct cost to Walter lab: \$30,000; provides no indirect costs
- 3/1/16-2/28/17: University of Michigan Comprehensive Cancer Center Research Grant (co-PI with Muneesh Tewari); total cost over 1 year: \$50,000; *A Novel Single Molecule Counting Technology Enabling Non-Invasive Detection and Monitoring of Cancer via Trans-Renal Circulating Tumor DNA in Urine*; current year direct cost to Walter lab: \$25,000; provides no indirect costs
- 4/1/16-3/31/17: University of Michigan MCubed 2.0 grant (PI with co-PIs Muneesh Tewari, Arul Chinnaiyan, Shuichi Takayama); total cost over 2 years: \$60,000; *Single-molecule counting of cancer biomarker RNAs in human biofluids*; current year direct cost to Walter lab: \$60,000; provides no indirect costs
- 4/1/16-3/31/17: University of Michigan Fast Forward GI Innovation Fund grant (co-PI with Muneesh Tewari); total cost over 1 year: \$50,000; *A New Technology for Single Molecule Counting of Stool Mutant DNA Biomarkers for Colorectal Cancer*; current year direct cost to Walter lab: \$25,000; provides no indirect costs
- 8/1/12-8/31/17: 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
- 6/1/16-5/31/18: University of Michigan Comprehensive Cancer Center/Biointerfaces Institute Research Grant (co-PI with Sunitha Nagrath and Nithya Ramnath); total cost over 1 year: \$100,000; *Pilot Project-Single Molecule Characterization of Circulating Tumor Cells in Lung Cancer*; current year direct cost to Walter lab: \$40,000; provides no indirect costs
- 02/01/17-04/30/18 MiTRAC Grant University of Michigan & State of MI (co-PIs Walter, Tewari); total direct cost over 2 years: \$200,000; *A high-specificity, direct single molecule counting technology to enable cell-free DNA-based liquid biopsy for oncology*; current year direct cost to Walter lab: \$100,000; provides 15% indirect costs
- 7/1/17-6/30/18 NIH R01 GM094450 (PI: Chen); total cost: \$1,313,468; *Molecular mechanism of telomerase actions*; current year direct cost to Walter lab: \$45,000 for one year only; provides full indirect costs

**GRANTS, PENDING**

MANY

### **FELLOWSHIPS OF CURRENT STUDENTS**

Mr. Ameya Jalihal	Cellular & Molecular Biology Training Grant Fellowship
Dr. Julia Widom	Ruth L. Kirschstein National Research Service Postdoctoral Fellowship; NIGMS K99/R00 Path to Independence Award

### **PROFESSIONAL ORGANIZATIONS**

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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**

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Associate Editor, *Methods* (since 2015; Editorial Advisory Board member since 2013)  
 Editorial Board Member, *Journal of Biological Chemistry* (since 2017)  
 Co-Editor-in-Chief, *Wiley Interdisciplinary Reviews (WIREs): Nanomedicine and Nanobiotechnology* (since 2018; Associate Editor 2010-2016)  
 Associate Editor, *Biopolymers* (2007-2016)  
 Advisory Board, NIH Chemistry-Biology Interface T32 Training Grant (since 2019)  
 Editorial Advisory Board member of Versita Open Access Books program in Chemistry (since 2012)  
 Organizer, Principles of Single Molecule Techniques Course 2014, October 13<sup>th</sup> – 14<sup>th</sup>, 2014, Ann Arbor, MI, USA  
 Co-Organizer, 2<sup>nd</sup> Midwest Single Molecule Workshop, July 26<sup>th</sup> – 27<sup>th</sup>, 2012, Ann Arbor, MI, USA  
 Lead Co-Organizer, 17<sup>th</sup> RNA Society meeting, May 29<sup>th</sup> – June 3<sup>rd</sup>, 2012, Ann Arbor, MI, USA  
 Co-Organizer, 16<sup>th</sup> International Conference on Luminescence, June 26<sup>th</sup> – July 1<sup>st</sup>, 2011, Ann Arbor, MI, USA  
 Lead Organizer, Single Molecule Symposium, May 18<sup>th</sup> – 19<sup>th</sup>, 2006, Ann Arbor, MI, USA  
 Organizer, MI RNA Society meeting 2002, Ann Arbor, MI, USA  
 Guest editor of two volumes of *Chemical Reviews* on *Single molecule imaging and mechanics: seeing and touching molecules one at a time* (2014) and *RNA: From Single Molecules to Medicine* (2017)  
 Guest editor of two issues of *Methods* on *RNA dynamics* (2009) and *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)  
 Scientific Advisory Board, Onconetics, Inc. (San Francisco, since 2017)  
 Chartered Member, NIH MSFB Study Section, Oct 2009-June 2013; Ad-hoc Member of numerous other NIH study sections  
 Co-Founder, Alight Sciences LLC (Ann Arbor, May 2017)

## PUBLICATIONS (CURRENTLY OVER 160, IN CHRONOLOGICAL ORDER)

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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<sup>-</sup>* 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 $\beta$  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.
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126. **Walter, N.G.\*** and Bustamante C.J. (2014) Introduction to single molecule imaging and mechanics: seeing and touching molecules one at a time. *Chem. Rev.* **114**, 3069-3071. PMCID in progress.
127. Pitchiaya, S., Custer, T.C., Heinicke, L.A. and **Walter, N.G.\*** (2014) Single molecule fluorescence approaches shed light on intracellular RNAs. *Chem. Rev.* **114**, 3224-3265. PMCID: PMC3968247.
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129. Johnson-Buck, A. and **Walter, N.G.\*** (2014) Discovering anomalous hybridization kinetics on DNA nanostructures using single-molecule fluorescence microscopy. *Methods* **67**, 177-184. PMCID in progress.
130. Sripathi, K.N., Tay, W., Banáš, P., Otyepka, M., Šponer, J. and **Walter, N.G.\*** (2014) Disparate HDV ribozyme crystal structures represent intermediates on a rugged folding free energy landscape. *RNA* **20**, 1112-1128. PMCID: PMC4114689.
131. Johnson-Buck, A., Jiang, S., Yan, H. and **Walter, N.G.\*** (2014) DNA-cholesterol barges as programmable membrane-exploring agents. *ACS Nano* **8**, 5641-5649. PMCID in progress.
132. Fu, J.\* , Yang, Y., Johnson-Buck, A., Liu, M., Liu, Y., **Walter, N.G.**, Woodbury, N.W. and Yan, H.\*

- (2014) Multi-enzyme complexes on DNA scaffolds capable of substrate channeling with an artificial swinging arm. *Nat. Nanotechnol.* **9**, 531-536. PMID in progress.
133. Pitchiaya, S., Androsavich, J.R. and **Walter, N.G.\*** (2014) Breaking Abbe's law: Super-accuracy and super-resolution fluorescence microscopy based on single molecule detection. Chapter 9, pp. 228-258, in *Biophysical Cell Biology: Imaging Life across the Scales* (Howard, G.C., Brown, W.E. and Auer, M., Eds.) Oxford University Press. PMID in progress.
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136. Rinaldi, A.J., Suddala, K.C. and **Walter, N.G.\*** (2015) Native purification and labeling of RNA for single molecule fluorescence studies. *Methods Mol. Biol.* **1240**, 63-95. PMID: PMC4254587.
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139. Sripathi, K.N., Banas, P., Reblova, K., Šponer, J. and **Walter, N.G.\*** (2015) Wobble pairs of the HDV ribozyme play specific roles in stabilization of active site dynamics. *Phys. Chem. Chem. Phys.* **17**, 5887-5900. PMID: PMC4324322.
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156. Fu, J.\*, Yang, Y.R., Dhakal, S., Zhao, Z., Liu, M., Zhang, T., **Walter, N.G.** and Yan, H. (2016) DNA nanostructure-scaffolded assembly of multi-enzyme complexes. *Nat. Protoc.* **11**, 2243-2273. PMID in progress.
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162. Mieritz, D., Li, X., Volosin, A., Liu, M., Yan, H., **Walter, N.G.\*** and Seo, D.-K.\* (2017) Tracking Single DNA Nanodevices in Hierarchically Meso-Macroporous Antimony-Doped Tin Oxide Demonstrates Finite Confinement. *Langmuir* **33**, 6410-6418.
163. Daher, M., Morriss-Andrews, A., Mustoe, A.M., Brooks III, C.L.\* and **Walter, N.G.\*** (2017) Tuning RNA folding and function through rational design of junction topology. *Nucleic Acids Res.* **45**, 9706-9715.
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165. Daher, M., Widom, J.R., Tay, W. and **Walter, N.G.\*** (2018) Soft interactions with model crowders and non-canonical interactions with cellular proteins stabilize RNA folding. *J. Mol. Biol.* **430**, 509-523.
166. **Walter, N.G.\*** and Maquat, L.E.\* (2018) Introduction to "RNA: From Single Molecules to Medicine". *Chem. Rev.* **118**, 4117-4119.
167. Ray, S., Widom, J.R. and **Walter, N.G.\*** (2018) Life under the microscope: Single-molecule fluorescence highlights the RNA World. *Chem. Rev.* **118**, 4120-4155.
168. Sponer, J.\* , Bussi, G.\* , Krepl, M., Banáš, P., Bottaro, S., Cunha, R.A., Gil-Ley, A., Pinamonti, G., Poblete, S., Jurecka, P., **Walter, N.G.** and Otyepka, M. (2018) RNA structural dynamics as captured by molecular simulations: a comprehensive overview. *Chem. Rev.* **118**, 4177-4338.
169. Michelini, F., Jalihal, A., Francia, S., Meers, C., Neeb, Z. T., Rossiello, F., Gioia, U., Aguado, J., Luke, B., Biamonti, G., Nowacki, M., Storici, F., Carninci, P., **Walter, N.G.** and d'Adda di Fagagna, F.\* (2018) From "cellular" RNA to "smart" RNA: multiple roles of RNA in genome stability. *Chem. Rev.* **118**, 4365-4403.
170. Suddala, K.C., Cabello-Villegas, J., Michnicka, M., Nikonowicz, E.P.\* and **Walter, N.G.\*** (2018) Hierarchical mechanism of amino acid sensing by the T-box riboswitch. *Nat. Commun.* **9**, 1896.
171. Valero, J., Pal, N., Dhakal, S., **Walter, N.G.** and Famulok, M.\* (2018) A bio-hybrid DNA rotor/stator nanoengine that moves along predefined tracks. *Nat. Nanotechnol.* **13**, 496-503.
172. Yang, G., Liu, C., Chen, S.-H., Kassab, M., Hoff, J.D., **Walter, N.G.** and Yu, X.\* (2018) Super-resolution imaging identifies PARP1 and the Ku complex acting as DNA double-strand break sensors. *Nucleic Acids Res.* **46**, 3446-3457.
173. Li, J., Johnson-Buck, A., Yang, Y.R., Shih, W.M., Yan, H. and **Walter, N.G.\*** (2018) Exploring the speed limit of toehold exchange with a cartwheeling DNA acrobat. *Nat. Nanotechnol.* **13**, 723-729.
174. Hayward, S.L., Lund, P.E., Kang, Q., Johnson-Buck, A.\* , Tewari, T.\* and **Walter, N.G.\*** (2018) Ultra-specific and amplification-free quantification of mutant DNA by single-molecule kinetic fingerprinting. *J. Am. Chem. Soc.* **140**, 11755-11762.

175. Widom, J.R., Nedialkov, Y.A., Rai, V., Hayes, R.L., Brooks, C.L., Artsimovitch, I. and **Walter, N.G.\*** (2018) Ligand-modulated cross-coupling between riboswitch folding and transcriptional pausing. *Mol. Cell* **72**, 541-552.
176. Jalihal, A.P., Lund, P.E. and **Walter, N.G.\*** (2019) Coming together: RNAs and proteins assemble under the single molecule fluorescence microscope. In *The RNA Worlds: New Tools for Deep Exploration*, pp. 451-470 (Ed. T.R. Cech, J.A. Steitz & J.F. Atkins), Cold Spring Harbor Laboratory Press.
177. **Walter, N.G.\*** (2019) Convergence of science and technology: fluorescent resolution of single RNA molecules. *Methods* **153**, 1-2.
178. Johnson-Buck, A., Li, J., Tewari, M. and **Walter, N.G.\*** (2019) A guide to nucleic acid detection by single-molecule kinetic fingerprinting. *Methods* **153**, 3-12.
179. Ray, S., Chauvier, A. and **Walter, N.G.\*** (2019) Kinetics coming into focus: Single-molecule microscopy of riboswitch dynamics. *RNA Biol.*, in press.
180. Weng, R., Lou, S., Li, L., Zhang, Y., Qiu, J., Su, X.\*, Qian, Y.\* and **Walter, N.G.\*** (2019) Single-molecule kinetic fingerprinting for the ultrasensitive detection of small molecules with aptasensors. *Anal. Chem.*, in press.
181. Prakash, V., Tsekouras, K., Venkatachalapathy, M., Heinicke, L.A., Pressé, S., **Walter, N.G.** and Krishnan, Y. (2018) Quantitative maps of endosomal DNA processing by single molecule counting. *Angew. Chem. Int Ed.*, in press.
182. Pitchiaya, S., Mourao, M.D.A., Jalihal, J., Xiao, L., Jiang, X., Chinnaiyan, A.M., Schnell, S. and **Walter, N.G.\*** (2018) Dynamic recruitment of single RNAs to processing bodies depends on RNA functionality. *Mol. Cell*, in press.
183. Suddala, K.C., Price, I.R., Janeček, M., Kührová, P., Dandpat, S., Šponer, J., Banáš, P., Ke A. and **Walter, N.G.\*** (2018) Local-to-global signal transduction at the core of the manganese-sensing riboswitch. *Nat. Chem. Biol.*, under review.
184. **Walter, N.G.\*** (2019) Refining Biological Specificity in the Cell – Why Diversity Matters. *BioEssays*, under review.
185. Hecker, N., Kahlscheuer, M.L., Kerpedjiev, P., Stadler, P.F., Gorodkin, J., Hofacker, I.L., **Walter, N.G.\*** and Qin, J.\* (2019) FRETtranslator: translating FRET traces into RNA structural pathways. *PLOS Comp. Biol.*, under revision.

Several additional publications are currently in review or preparation.

\* denotes corresponding author.

## PATENTS AND DISCLOSURES OF INVENTION

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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*, US Patent 9,223,064.
3. **Nils G. Walter**, Alexander Johnson-Buck, Mario Blanco and Arlie Rinaldi (2015) **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.

4. **Nils G. Walter**, Muneesh Tewari and Alexander Johnson-Buck (2018) U.S. Pat. App. Ser. No. 14/589,467 (UM 6250/6472; CJUM-33976/US-3/ORD) issued: *Detection of nucleic acids*. Additional related disclosures of invention and new technology were filed through the University of Michigan's Office of Technology Transfer and are being pursued as patents: Refs # 6948, 7340, 7413, 7622, 7623, 7638, 7735, 7737, 7818

## INVITED SPEAKING ENGAGEMENTS

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1. Seminar, April, 3<sup>rd</sup>, 1994, Department of Microbiology and Molecular Genetics, University of Vermont, Burlington, VT, USA.
2. Seminar, April, 4<sup>th</sup>, 1994, Department of Molecular Biology, Massachusetts General Hospital, Boston, MA, USA.
3. Seminar, April, 6<sup>th</sup>, 1994, Department of Molecular Biology and Biochemistry, Rockefeller University, New York, NY, USA.
4. Seminar, April, 12<sup>th</sup>, 1997, Department of Molecular Biophysics and Biochemistry, Yale University, New Haven, CT, USA.
5. Seminar, October 3<sup>rd</sup>, 1997, Department of Molecular Biology, Scripps Research Institute, La Jolla, CA, USA.
6. Seminar, January 13<sup>th</sup>, 1999, Department of Chemistry, University of Michigan, Ann Arbor, MI, USA.
7. Seminar, January 22<sup>nd</sup>, 1999, Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University, Ames, IA, USA.
8. Seminar, April 8<sup>th</sup>, 1999, Biophysics Research Division, University of Michigan, Ann Arbor, MI, USA.
9. Seminar, April 21<sup>st</sup>, 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 25<sup>th</sup>, 1999, Ann Arbor, MI, USA.
11. Platform talk at the Rust Belt RNA Meeting, November 4<sup>th</sup> – 5<sup>th</sup>, 1999, Mt. Sterling, OH, USA.
12. Seminar, March 24<sup>th</sup>, 2000, Biology Department, University of Michigan, Flint, MI, USA.
13. Seminar, April 6<sup>th</sup>, 2000, Physics Department, Applied Physics Program, University of Michigan, Ann Arbor, MI, USA.
14. Seminar, April 11<sup>th</sup>, 2000, Biophysics Research Division, University of Michigan, Ann Arbor, MI, USA.
15. Seminar, July 12<sup>th</sup>, 2000, Chemistry Department, Stanford University, Stanford, CA, USA.
16. Seminar, October 26<sup>th</sup>, 2000, Department of Chemistry and Biochemistry, Middlebury College, Middlebury, VT, USA.
17. Seminar, October 27<sup>th</sup>, 2000, Department of Chemistry, College of the Holy Cross, Worcester, MA, USA.
18. Seminar, November 15<sup>th</sup>, 2000, Chemistry Department & Center for Photochemical Sciences, Bowling Green State University, Bowling Green, OH, USA.
19. Seminar, February 21<sup>st</sup>, 2001, Chemistry Department, Oakland University, Rochester, MI, USA.
20. Seminar, February 26<sup>th</sup>, 2001, Chemistry Department, Peking University, Beijing, China.
21. Invited talk at the RNA Society Meeting, May 29<sup>th</sup> - June 3<sup>rd</sup>, 2001, Banff, Alberta, Canada.
22. Invited talk at the Michigan RNA Society Meeting, September 29<sup>th</sup>, 2001, Wayne State University, Detroit, MI, USA.

23. Seminar, December 17<sup>th</sup>, 2001, Department of Biochemistry and Molecular Biophysics, Columbia University, New York City, NY, USA.
24. Seminar, April 5<sup>th</sup>, 2002, Department of Chemistry, Michigan Technological University, Houghton, MI, USA.
25. Seminar, May 2<sup>nd</sup>, 2002, Alumni Advisory Council Department of Chemistry, University Michigan, Ann Arbor, MI, USA.
26. Invited talk at the RNA Society Meeting, May 28<sup>th</sup> - June 2<sup>nd</sup>, 2002, Madison, WI, USA.
27. Seminar, July 11<sup>th</sup>, 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 23<sup>rd</sup> – 27<sup>th</sup>, 2002, Dundee, Scotland, UK.
29. Seminar, February 4<sup>th</sup>, 2003, Departments of Microbiology & Molecular Genetics and Biochemistry, Michigan State University, Lansing, MI, USA.
30. Seminar, May 19<sup>th</sup>, 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 1<sup>st</sup> - 6<sup>th</sup>, 2003, in Newport, RI, USA.
32. Seminar, June 10<sup>th</sup>, 2003, Department of Biochemistry and Molecular Biology, University of Chicago, Chicago, IL, USA.
33. Invited talk at “Albany 2003, The 13<sup>th</sup> Conversation” 2003, June 17<sup>th</sup> – 21<sup>st</sup>, 2003, in Albany, NY, USA.
34. Invited talk at the RNA Society Meeting, July 1<sup>st</sup> - July 6<sup>th</sup>, 2003, Vienna, Austria.
35. Seminar, July 14<sup>th</sup>, 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, 226<sup>th</sup> ACS National Meeting, September 7<sup>th</sup> - 11<sup>th</sup>, 2003, New York City, NY, USA.
37. Seminar, September 10<sup>th</sup>, 2003, Department of Chemistry and Biochemistry, University of Colorado at Boulder, Boulder, CO, USA.
38. Seminar, September 30<sup>th</sup>, 2003, Dow Corning Corporation, Midland, MI, USA.
39. Seminar, October 10<sup>th</sup>, 2003, Biophysics Research Division and Department of Chemistry, University of Michigan, Ann Arbor, MI, USA
40. Seminar, February 9<sup>th</sup>, 2004, Beckman Institute for Advanced Science and Technology, University of Illinois Urbana-Champaign, Urbana-Champaign, IL, USA.
41. Seminar, March 5<sup>th</sup>, 2004, Department of Chemistry, University of Indiana at Bloomington, Bloomington, IN, USA.
42. Seminar, April 9<sup>th</sup>, 2004, Department of Chemistry and Biochemistry, University of California San Diego, San Diego, CA, USA.
43. Lunch seminar, April 14<sup>th</sup>, 2004, Biophysics Research Division, University of Michigan, Ann Arbor, MI, USA.
44. Seminar, April 23<sup>rd</sup>, 2004, Department of Biochemistry, Duke University, Durham, NC, USA.
45. Invited talk at the RNA Society Meeting, June 1<sup>st</sup> – 6<sup>th</sup>, 2004, Madison, Wisconsin, USA.

46. Invited talk at the Gordon Research Conference “Nucleic Acids” 2004, June 6<sup>th</sup> - 11<sup>th</sup>, 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, 228<sup>th</sup> ACS National Meeting, August 22<sup>nd</sup> - 26<sup>th</sup>, 2004, Philadelphia, PA, USA.
48. Seminar, September 10<sup>th</sup>, 2004, Department of Chemistry, Pennsylvania State University, University Park, PA, USA.
49. Seminar, September 13<sup>th</sup>, 2004, Department of Biophysics, Johns Hopkins University, Baltimore, MD, USA.
50. Invited talk at the “Aptamers in Analysis” Symposium at the FACSS Meeting, October 3<sup>rd</sup> - 7<sup>th</sup>, 2004, Portland, OR, USA.
51. Seminar, October 25<sup>th</sup>, 2004, Department of Chemistry, University of Rochester, Rochester, NY, USA.
52. Seminar, November 30<sup>th</sup>, 2004, Department of Chemistry, University of California Davis, Davis, CA, USA.
53. Seminar, December 3<sup>rd</sup>, 2004, Department of Chemistry, University of Zürich, Switzerland, USA.
54. Seminar, January 19<sup>th</sup>, 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 6<sup>th</sup> - 11<sup>th</sup>, 2005, in Ventura, CA, USA.
56. Seminar, March 2<sup>nd</sup>, 2005, Department of Chemistry, University of Minnesota, Minneapolis, MN, USA.
57. Seminar, March 23<sup>rd</sup>, 2005, Department of Chemistry, Bowling Green State University, Bowling Green, OH, USA.
58. Seminar, April 5<sup>th</sup>, 2005, Department of Chemistry, Allegheny College, PA, USA.
59. Invited talk at “Albany 2005, The 14<sup>th</sup> Conversation” 2005, June 14<sup>th</sup> – 18<sup>th</sup>, 2005, in Albany, NY, USA.
60. Seminar, October 20<sup>th</sup>, 2005, Department of Chemistry, Andrews University, MI, USA.
61. Seminar, October 25<sup>th</sup>, 2005, Department of Biochemistry, University of Colorado Health Sciences Center, CO, USA.
62. Invited talk at the Biophysical Society meeting 2006, February 18<sup>th</sup> – 22<sup>nd</sup>, 2006, in Salt Lake City, UT, USA.
63. Seminar, February 22<sup>nd</sup>, 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&19<sup>th</sup>, 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 15<sup>th</sup>, 2006, JILA/University of Colorado, Boulder, CO, USA.
67. Seminar, September 15<sup>th</sup>, 2006, Department of Biochemistry, Biophysics discussion series, Brandeis University, MA, USA.
68. Seminar, September 21<sup>st</sup>, 2006, Department of Physics, Northeastern University, MA, USA.
69. Seminar, September 22<sup>nd</sup>, 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 30<sup>th</sup>, 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 5<sup>th</sup>, 2006, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA, USA.
74. Seminar, December 18<sup>th</sup>, 2006, Ambion Inc./Applied Biosystems, Austin, TX, USA.
75. Seminar, February 8<sup>th</sup>, 2007, Biology Student Club, University of Michigan, Ann Arbor, MI, USA.
76. Seminar, March 23<sup>th</sup>, 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, 234<sup>th</sup> ACS National Meeting, August 19<sup>th</sup> - 23<sup>rd</sup>, 2007, Boston, MA, USA.
78. Invited talk at the 27<sup>th</sup> Midwest Enzyme Chemistry Conference (MECC), Sept 29<sup>th</sup>, 2007, Chicago, IL, USA.
79. Seminar, January 24<sup>th</sup>, 2008, Society of Biology Students, University of Michigan, Ann Arbor, MI, USA.
80. Seminar, February 12<sup>th</sup>, 2008, Department of Chemistry, SUNY Albany, Albany, NY, USA.
81. Seminar, February 13<sup>th</sup>, 2008, Applied Physics Program, University of Michigan, Ann Arbor, MI, USA.
82. Seminar, February 25<sup>th</sup>, 2008, Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany.
83. Seminar, February 28<sup>th</sup>, 2008, Department of Chemistry Johann Wolfgang Goethe University Frankfurt, Frankfurt, Germany.
84. Seminar, March 11<sup>th</sup>, 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 5<sup>th</sup> - 8<sup>th</sup>, 2008, San Diego, CA, USA.
86. Seminar, April 23<sup>rd</sup>, 2008, Chemistry department staff, University of Michigan, Ann Arbor, MI, USA.
87. Seminar, October 1<sup>st</sup>, 2008, Chemistry Department, Bowling Green State University, Bowling Green, OH, USA.
88. Seminar, October 10<sup>th</sup>, 2008, Department of Chemistry, University of Michigan, Ann Arbor, MI, USA.
89. Seminar, October 23<sup>rd</sup>, 2008, Department of Chemistry and Biochemistry, UT Austin, Austin, TX, USA.
90. Seminar, December 5<sup>th</sup>, 2008, Department of Chemistry, Purdue University, West Lafayette, IN, USA.
91. Invited talk at the Telluride workshop on “RNA Dynamics”, July 27<sup>th</sup>-31<sup>st</sup>, 2009, Telluride, CO, USA.
92. Invited talk at the Gen-AU project cluster workshop, September 24<sup>th</sup>-25<sup>th</sup>, 2009, Innsbruck/Seefeld, Austria.
93. Seminar, October 21<sup>st</sup>, 2009, Department of Chemistry, Oakland University, Rochester, MI, USA.
94. Invited talk at the Symposium on Watching Biomolecules in Action (WBMA’09), December 15<sup>th</sup>-17<sup>th</sup>, Osaka, Japan.

95. Seminar, February 19<sup>th</sup>, 2010, Department of Chemistry, Albion College, Albion, MI, USA.
96. Seminar, February 22<sup>nd</sup>, 2010, Nanobiology Certificate seminar series, University of Michigan, Ann Arbor, MI, USA.
97. Seminar, March 9<sup>th</sup>, 2010, Department of Biological Sciences, Western Michigan University, Kalamazoo, MI, USA.
98. Seminar, April 21<sup>nd</sup>, 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 14<sup>th</sup>-18<sup>th</sup>, 2010, Telluride, CO, USA.
100. Invited talk at the Midwest Single Molecule Workshop, July 26<sup>th</sup>-27<sup>th</sup>, 2010, St. Louis, MO, USA.
101. Seminar, September 3<sup>rd</sup>, 2010, Department of Chemistry, Jackson State University, Jackson, MS, USA.
102. Seminar, October 18<sup>th</sup>, 2010, BioMolecular Markers seminar, Department of Chemistry, University of Cincinnati, Cincinnati, OH, USA.
103. Seminar, November 5<sup>th</sup>, 2010, Department of Chemistry, Saint Louis University, Saint Louis, MI, USA.
104. Seminar, March 11<sup>th</sup>, 2011, Chemistry-Biology Interface Training Grant Symposium, University of Michigan, Ann Arbor, MI, USA.
105. Buchanan lecture, April 19<sup>th</sup> & 20<sup>th</sup>, 2011, Departments of Biology, Chemistry and Physiology, Bowling Green State University, Bowling Green, OH, USA.
106. Invited talk at the RNA Society Meeting, June 14<sup>th</sup> – 19<sup>th</sup>, 2011, Kyoto, Japan.
107. Seminar, June 20<sup>th</sup>, 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”, 242<sup>nd</sup> ACS Meeting, Aug 28<sup>th</sup> – Sept 1<sup>st</sup>, 2011, Denver, CO, USA.
109. Seminar, September 2<sup>nd</sup>, 2011, Department of Biochemistry, University of Missouri Medical School, Columbia, MO, USA.
110. Seminar, November 2<sup>nd</sup>, 2011, Department of Biochemistry, University of Rochester Medical School, Rochester, NY, USA.
111. Seminar, January 24<sup>th</sup>, 2012, Department of Molecular & Cell Biology, University of California Berkeley, Berkeley, CA, USA.
112. Seminar, January 25<sup>th</sup>, 2012, Bay Area RNA Club, held at University of California San Francisco, California, CA, USA.
113. Seminar, February 20<sup>th</sup>, 2012, Department of Molecular Biology and Biochemistry, Simon Fraser University, British Columbia, Canada.
114. Seminar, March 2<sup>nd</sup>, 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 2<sup>nd</sup>, 2012, Department of Chemistry, Rice University, Houston, TX, USA.
116. Seminar, May 8<sup>th</sup>, 2012, Department of Biology, University of North Carolina, Chapel Hill, NC, USA.
117. Seminar, June 15<sup>th</sup>, 2012, Department of Chemistry and Biochemistry, Lise-Meitner Kolloquium, Free University of Berlin, Berlin, Germany.



118. Seminar, June 18<sup>th</sup>, 2012, Department of Chemistry, Heinrich-Heine University Düsseldorf, Düsseldorf, Germany.
119. Seminar, June 22<sup>nd</sup>, 2012, Max-Planck-Institute for Biophysical Chemistry, Göttingen, Germany.
120. Seminar, June 25<sup>th</sup>, 2012, Rudolph-Boehm-Institute for Pharmacology and Toxicology, University of Leipzig, Leipzig, Germany.
121. Seminar, June 26<sup>th</sup>, 2012, Medical Faculty, Graduiertenkolleg GRK1591, Martin-Luther-University Halle-Wittenberg, Halle, Germany.
122. Seminar, June 28<sup>th</sup>, 2012, Department of Biology, Technical University of Darmstadt, Darmstadt, Germany.
123. Seminar, July 3<sup>rd</sup>, 2012, Department of Chemistry, University of Konstanz, Konstanz, Germany.
124. Seminar, July 5<sup>th</sup>, 2012, Institute for Biochemistry, Genetics and Microbiology, Sonderforschungsbereich 960 "Ribosome Formation", University of Regensburg, Regensburg, Germany.
125. Seminar, July 9<sup>th</sup>, 2012, Department of Chemistry, GDCh-Kolloquium, Technical University of Dortmund, Dortmund, Germany.
126. Seminar, July 11<sup>th</sup>, 2012, LIMES-Institute, Life and Medical Sciences Bonn, Rheinische Friedrich-Wilhelms University Bonn, Bonn, Germany.
127. Seminar, July 12<sup>th</sup>, 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 13<sup>th</sup>, 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 27<sup>th</sup> & 29<sup>th</sup>, 2012, "From Ensemble to Single Molecule Fluorescence: Conformational Changes and Super-resolved Movement", Biocenter, Johann Wolfgang Goethe University Frankfurt, Frankfurt, Germany.
130. Seminar, Oct 12<sup>th</sup>, 2012, Department of Chemistry, University of Missouri, Columbia, MO, USA.
131. Seminar, Oct 17<sup>th</sup>, 2012, The Exposure Series-PechaKucha, University of Michigan, MI, USA.
132. Seminar, Oct 24<sup>th</sup>, 2012, Department of Chemistry, Louisiana State University, Baton Rouge, LA, USA.
133. Seminar, Oct 25<sup>th</sup>, 2012, Department of Chemistry, Xavier University, New Orleans, LA, USA.
134. Seminar, Jan 30<sup>th</sup>, 2013, Applied Physics seminar, University of Michigan, MI, USA.
135. Seminar, Mar 5<sup>th</sup>, 2013, Department of Chemistry and Biochemistry, Biophysics program, University of Maryland, College Park, MD, USA.
136. Seminar, May 23<sup>rd</sup>, 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 2<sup>nd</sup>-7<sup>th</sup>, 2013, University of New England, Biddeford, Maine, USA.
138. Seminar, Jun 10<sup>th</sup>, 2013, SEMMinar program, iFOM-IEO, Milan, Italy.
139. Invited talk at the RNA Society Meeting, June 11<sup>th</sup> – 16<sup>th</sup>, 2013, Davos, Switzerland.
140. Invited talk at the 1<sup>st</sup> Korea Symposium on "Current Trends in Biophysics", Aug 11<sup>th</sup>-14<sup>th</sup>, 2013, Korea Institute for Advanced Study, Seoul, South Korea.

141. Seminar, Oct 11<sup>th</sup>, 2013, Department of Chemistry and Biochemistry, University of Notre Dame, South Bend, IN, USA.
142. Seminar, Oct 18<sup>th</sup>, 2013, Department of Physics, Center for the Physics of Living Cells, University of Illinois at Urbana-Champaign, Urbana, IL, USA.
143. Seminar, Nov 6<sup>th</sup>, 2013, Department of Pharmaceutical Sciences, University of Michigan, Ann Arbor, MI, USA.
144. Seminar, Nov 8<sup>th</sup>, 2013, Department of Chemistry and Biochemistry, Arizona State University, Tempe, AZ, USA.
145. Seminar, Jan 23<sup>rd</sup>, 2014, Seminar to the Biology Student Alliance, University of Michigan, MI, USA.
146. Seminar, Feb 22<sup>nd</sup>, 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 2<sup>nd</sup>-6<sup>th</sup>, 2014, Chicago, IL, USA.
148. Seminar, Mar 5<sup>th</sup>, 2014, Department of Biochemistry and Molecular Biology, University of Chicago, Chicago, IL, USA.
149. Seminar, Mar 18<sup>th</sup>, 2014, Seminar at the Rackham Chairs and Directors Meeting, University of Michigan, MI, USA.
150. Seminar, Mar 22<sup>nd</sup>, 2014, Department of Physics – Saturday Morning Physics, University of Michigan, Ann Arbor, MI, USA.
151. Seminar, Mar 31<sup>st</sup>, 2014, Department of Physics, Michigan State University, East Lansing, MI, USA.
152. Seminar, Apr 4<sup>th</sup>, 2014, Department of Chemistry and Biochemistry, UC Santa Cruz, Santa Cruz, CA, USA.
153. Seminar, Jul 14<sup>th</sup>, 2014, Regional Centre of Advanced Technologies and Materials, Palacký University, Olomouc, Czech Republic.
154. Seminar, Oct 3<sup>rd</sup>, 2014, Department of Chemistry, Penn State University, College Park, PA, USA.
155. Seminar, Mar 6<sup>th</sup>, 2015, Department of Chemistry, Truman State University, Kirksville, MO, USA.
156. Seminar, Apr 9<sup>th</sup>, 2015, Department of Physics, Kent State University, Kent, OH, USA.
157. Seminar, Apr 20<sup>th</sup>, 2015, Department of Biophysics, Johns Hopkins University, Baltimore, MD, USA.
158. Jean Dreyfus Boissevain Lectures, Jul 7<sup>th</sup> and 8<sup>th</sup>, 2015, Department of Chemistry, Trinity University, San Antonio, TX, USA.
159. Invited talk at the Telluride workshop on “RNA Dynamics”, July 20<sup>th</sup>-24<sup>th</sup>, 2015, Telluride, CO, USA.
160. Seminar, Sep 14<sup>th</sup>, 2015, Department of Chemistry and Biochemistry, San Francisco State University, San Francisco, CA.
161. Seminar, Oct 15<sup>th</sup>, 2015, NCIBI Tools and Technology seminar series, University of Michigan, Ann Arbor, MI.
162. Invited talk at Pacificchem 2015’s symposium “Single-molecule Fluorescence Imaging”, Dec 15<sup>th</sup> – 20<sup>th</sup>, 2015, Honolulu, HI, USA.
163. Invited talk at the MBI workshop “Modeling and Inference from Single Molecules to Cells”, Feb 8<sup>th</sup> – 12<sup>th</sup>, 2016, The Ohio State University, Columbus, OH, USA.

164. Seminar, Feb 26<sup>th</sup>, 2016, Department of Biological Chemistry, University of Michigan, Ann Arbor, MI, USA.
165. Seminar, Mar 15<sup>th</sup>, 2016, Genomics Institute of the Novartis Research Foundation, San Diego, CA, USA.
166. Invited talk at the Division of Biological Chemistry's symposium "RNA Structure and Function: Perspectives from inside the cell and out", 251<sup>st</sup> ACS Meeting, Mar 13<sup>th</sup> – 17<sup>th</sup>, 2016, San Diego, CA, USA.
167. Seminar, Mar 28<sup>th</sup>, 2016, as part of the FAPESP Week 2016 for outreach to Brazil, University of Michigan, Ann Arbor, MI, USA.
168. Seminar, Mar 29<sup>th</sup>, 2016, Department of Chemistry, Oregon State University, Corvallis, OR, USA.
169. Invited talk at the Fields Institute's "Workshop on Mathematical Oncology VI", Apr 11<sup>th</sup> – 13<sup>th</sup>, 2016, The Fields Institute, Toronto, Canada.
170. Seminar, Apr 21<sup>st</sup>, 2016, in the RNA Innovation Seminar series of the Center for RNA Biomedicine, University of Michigan, Ann Arbor, MI, USA.
171. Seminar, May 7<sup>th</sup>, 2016, Biointerfaces Institute/Comprehensive Cancer Center Challenge workshop, University of Michigan, Ann Arbor, MI, USA.
172. Invited talk at the Telluride "Single Molecule Workshop: Theory Meets Experiment", Jul 12<sup>th</sup>-16<sup>th</sup>, 2016, Telluride, CO, USA.
173. Seminar, Sep 19<sup>th</sup>, 2016, School of Molecular Sciences, Arizona State University, Tempe, AZ, USA.
174. Invited talk at Elsevier's Berlin Translational Dialogue "RNA-Medicine: from RNA Discoveries to Future Therapies", Nov 8<sup>th</sup>, 2016, Berlin, Germany.
175. Seminar, Nov 10<sup>th</sup>, 2016, Institute for Physical Chemistry, University of Freiburg, Freiburg, Germany.
176. Invited talk at the Gordon Research Conference "RNA Nanotechnology" 2017, Jan 22<sup>nd</sup>-27<sup>th</sup>, 2017, Ventura, CA, USA.
177. Invited talk at the Molecular Biophysics Subgroup Symposium at the Biophysical Society's 61<sup>st</sup> Annual Meeting, Feb 11<sup>th</sup>, 2017, New Orleans, LA, USA.
178. Seminar, Mar 9<sup>th</sup>, 2017, Life Sciences division, Bio-Rad headquarters, Hercules, CA, USA.
179. Seminar, Apr 17<sup>th</sup>, 2017, at the Biophysics Symposium, University of Michigan, Ann Arbor, MI, USA.
180. Seminar, Jun 6<sup>th</sup>, 2017, Department of Medicine, Imperial College London, London, UK.
181. Seminar, Jun 15<sup>th</sup>, 2017, Featured Speaker at Chemistry-Biology Interface Retreat, University of Rochester, Rochester, NY.
182. Invited talk at the Telluride workshop on "The Complexity of Dynamics and Kinetics from Single Molecules to Cells", Jun 20<sup>th</sup>-24<sup>th</sup>, 2017, Telluride, CO, USA.
183. Seminar, Jun 27<sup>th</sup>, 2017, RNA Institute, University at Albany, Albany, NY.
184. Invited talk at the "First Conference on Biomotors, Virus Assembly, and Nanobiotechnology Applications", August 16<sup>th</sup>-19<sup>th</sup>, 2017, Columbus, OH, USA.
185. Seminar, Sep 6<sup>th</sup>, 2017, Biophysics Program, Massachusetts Institute of Technology, Cambridge, MA, USA.
186. Seminar, Sep 18<sup>th</sup>, 2017, Department of Biochemistry and Molecular Biology, Pennsylvania State University, University Park, PA, USA.

187. Seminar, Nov 7<sup>th</sup>, 2017, Undergraduate Research Opportunities Program, University of Michigan, Ann Arbor, MI, USA.
188. Seminar, Nov 27<sup>th</sup>, 2017, Department of Chemistry, Brigham Young University, Provo, UT, USA.
189. Seminar, Feb 12<sup>th</sup>, 2018, Department of Chemistry and Biophysics Program, Boston University, Boston, MA, USA.
190. Seminar, Mar 2<sup>nd</sup>, 2018, Department of Chemistry, Western Washington University, Bellingham, WA, USA.
191. Seminar, May 11<sup>th</sup>, 2018, Department of Biological Chemistry, University of Michigan, Ann Arbor, MI, USA.
192. Seminar, Jun 19<sup>th</sup>, 2018, College of Life Science and Technology, Beijing University of Chemical Technology, Beijing, China.
193. Seminar, June 20<sup>th</sup>, 2018, Department of Chemistry, Peking University, Beijing, China.
194. Seminar, Jun 21<sup>st</sup>, 2018, Department of Chemistry, Nankai University, Tianjin, China.
195. Invited talk at the Telluride “Single Molecule Workshop: Theory Meets Experiment”, Jun 26<sup>th</sup>-30<sup>th</sup>, 2018, Telluride, CO, USA.
196. Seminar, Jul 12<sup>th</sup>, 2018, Investigators meeting, Chan Zuckerberg Biohub, San Francisco, CA, USA.
197. Seminar, Jul 20<sup>th</sup>, 2018, Chan Zuckerberg Biohub, San Francisco, CA, USA.
198. Seminar, Jul 25<sup>th</sup>, 2018, Exobiology group, NASA Ames Research Center, Moffett Field, CA, USA.
199. Seminar, Aug 8<sup>th</sup>, 2018, Department of Microbiology and Molecular Genetics, UC Davis, Davis, CA, USA.
200. Seminar, Aug 16<sup>th</sup>, 2018, Department of Cellular Molecular Pharmacology, UC San Francisco, San Francisco, CA, USA.
201. Seminar, Aug 30<sup>th</sup>, 2018, Sonderforschungsbereich (SFB) 902 symposium, “Understanding RNA-based Regulation in Cells”, Johann Wolfgang Goethe University Frankfurt, Frankfurt, Germany.
202. Seminar, Oct 5<sup>th</sup>, 2018, Department of Chemistry, Columbia University, New York City, NY, USA.
203. Invited talk at the 6<sup>th</sup> annual Wayne State University American Chemical Society Symposium, Oct 13<sup>th</sup>, 2018, Detroit, MI, USA.
204. Seminar, Nov 5<sup>th</sup>, 2018, Frontier Institute for Biomolecular Engineering Research (FIBER), Konan University, Kobe, Japan.
205. Invited talk at the 45<sup>th</sup> International Symposium on Nucleic Acids Chemistry (ISNAC 2018), Nov 7<sup>th</sup> – 9<sup>th</sup>, 2018, Kyoto, Japan.
206. Seminar, Nov 26<sup>th</sup>, 2018, Alberta RNA Research and Training Institute (ARRTI), University of Lethbridge, Lethbridge, Alberta, Canada.
207. Invited talk at the Gordon Research Conference “RNA Nanotechnology” 2019, Jan 13<sup>th</sup>-18<sup>th</sup>, 2019, Ventura, CA, USA.
208. Seminar, Jan 18<sup>th</sup>, 2019, California NanoSystems Institute, UC Los Angeles, Los Angeles, CA, USA.
209. Invited talk at the 6<sup>th</sup> Fusion Nucleic Acids Conference, Feb 13<sup>th</sup> – 16<sup>th</sup>, 2019, Nassau, Bahamas.
210. Seminar, Mar 21<sup>st</sup>, 2019, Taubman Institute Tech Talk, University of Michigan, Ann Arbor, MI, USA.
211. Seminar, Mar 27<sup>th</sup>, 2019, UROP Brown Bag Speaker Series, University of Michigan, Ann Arbor, MI, USA.

## RESEARCH GROUP

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### *Current Graduate Students (\* denotes member of a traditionally underrepresented group)*

Mr. Shiba Dandpat	from 5/1/16 (Chemistry student from 9/15)
Mr. Ameya Jalihal	from 5/1/16 (CMB student from 9/15)
Mr. Kunal Khanna	from 5/1/17 (Chemistry student from 9/16)
Ms. Karen Montoya *	from 5/1/18 (Chemistry student from 9/17)

### *Former Graduate Students*

Dr. John Androsavich	9/1/07 – 8/31/12	Chemical Biology student, now scientist at Regulus Therapeutics, San Diego; now Senior Scientist at RaNA Therapeutics, Boston
Mr. Berhane(gebriel) Assefa *	9/1/11 – 8/31/12	PIBS/CMB student, soccer coach
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
Ms. Elizabeth Cameron	5/1/14 – 4/30/17	Chemistry student
Dr. Erika Cline	9/1/08 – 5/30/13	PIBS/CMB student, now postdoctoral fellow with William L. Klein at Northwestern University
Dr. Corey Custer	5/1/12 – 9/15/16	Chembio IDP student, now Scientific Lab Manager at Eurofins Bioanalytical Services
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., then Laboratory of Molecular Biophysics at the NIH, now Assistant Professor of Chemistry at Howard University
Ms. Charity Haynes *	5/1/10 – 12/31/11	PIBS/Biophysics student, then School of Public Health
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, then postdoctoral fellow at Harvard Medical School
Dr. Matthew Kahlscheuer	5/1/10 – 04/30/15	Chemistry student, now Research Scientist with Apeel Sciences
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

Dr. Jieming Li	9/1/13	with Masters now Global Clinical and Analytical Scientist at GOJO Industries, Akron, OH
Dr. Paul Lund	9/1/10 – 08/31/15	Chemistry student, now Research Scientist with Bristol-Myers Squibb
Dr. Matthew Marek	9/1/07 – 08/31/14	Chembio IDP student, now continuing as postdoctoral fellow
Dr. Sarah (Liz) McDowell	9/1/07 – 08/31/14	PIBS/CMB student, now Research Scientist, Freelance
Dr. Nicole Michelotti	5/1/03 – 08/31/08	Biophysics student, now Director of the Science Learning Center at UM-Dearborn
Dr. Miguel Pereira	5/1/08 – 04/30/13	Physics student, now Postdoctoral Research Fellow w/ Timothy McKay/UM Physics
Dr. Sethu(ramasundaram) Pitchiaya	9/1/03 – 05/1/09	Chemistry student, now Postdoctoral Fellow, University of Utah School of Medicine.
Dr. Sethu(ramasundaram) Pitchiaya	5/1/07 – 12/31/11	Chemistry student, now postdoctoral fellow w/ Arul Chinnaiyan at the University of Michigan Medical School
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, then NSF liaison with White House Office of Science and Technology, now co-Executive Director of the South Big Data Innovation Hub at Georgia Tech
Dr. Maria Rhodes	1/1/01 – 06/30/06	Chemistry student, graduated
Dr. Arlie Rinaldi	6/1/10 – 04/30/13	Chemistry student, now 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, Post-Doctoral Researcher at Michigan State University Automated Analysis of Constructed Responses Group
Dr. Xin Su	9/1/13 – 09/30/14	visiting from Peking University as part his PhD, now Assistant Professor, China
Dr. Krishna Suddala	7/1/09 – 04/30/14	PIBS/Biophysics student, now Postdoctoral fellow at the NIH
Dr. Wendy Tay	7/1/10 – 04/30/14	Program in Chemical Biology student, now Program Manager at Maluuba (a Microsoft company)
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 Freelance Editor with proof-reading-service.com
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. T. Corey Custer -- Fluorescent labeling, co-tracking, and quantification of RNA *in cellulo*
- Dr. Chamaree de Silva-- Single molecule fluorescence imaging of biosensors, ribozymes and molecular spiders
- 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. Matthew Kahlscheuer-- Characterization of pre-mRNA dynamics and structure throughout spliceosome assembly and catalysis
- 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. Jieming Li-- Engineering Dynamic Behavior into Nucleic Acids Guided by Single Molecule Fluorescence Microscopy
- Dr. Paul Lund-- Interactions between the Translation Machinery and a Translational preQ<sub>1</sub> Riboswitch
- 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 cctivity *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 Master's student*

Brian Hardaway 9/1/17 – ongoing Master's student in Biochemistry

*Former Master's Students*

Qian Hou 5/1/16 – 4/30/17 Advanced Degree (Master's) student in Biochemistry, now PhD student, Weill Cornell Medicine

Jonathan Kuriakose 5/1/17 – 4/30/18 Advanced Degree (Master's) student in Biochemistry

*Current Research Assistant Professor*

Dr. Alexander Johnson-Buck 9/1/16 – present Research Assistant Professor, joint with Muneesh Tewari

*Current Postdoctoral Fellows*

Dr. Javier Cabello \* 9/14/16 – present Postdoctoral fellow  
 Dr. Surajit Chatterjee 12/12/16 – present Postdoctoral fellow  
 Dr. Tanmay Chatterjee 5/1/17 – present Postdoctoral fellow  
 Dr. Adrien Chauvier 8/1/17 – present Postdoctoral fellow  
 Dr. Elizabeth Duran \* 5/1/18 – present Postdoctoral fellow  
 Dr. Damon Hoff 1/1/13 – present Postdoctoral fellow, now Lab Manager in the Single Molecule Analysis in Real-Time (SMART) Center  
 Dr. Sujay Ray 2/1/16 – present Postdoctoral fellow  
 Dr. Poorna Roy 6/10/17 – present Postdoctoral fellow  
 Dr. Robb Welty 10/1/18 – present Postdoctoral fellow  
 Dr. Rajeev Yadav 2/1/17 – present Postdoctoral fellow

*Former Postdoctoral Fellows*

Dr. John Androsavich 9/1/12 – 09/30/12 now Postdoctoral fellow Regulus Therapeutics, San Diego  
 Mr. Joel Bentley 7/15/15 – 7/14/16 former Research Scientist in the Single Molecule Analysis in Real-Time (SMART) Center  
 Dr. Mario Blanco \* 5/1/13 – 12/31/13 now Postdoctoral fellow with Mitch Guttman at Caltech  
 Dr. Soma Dhakal 2/1/13 – 8/31/16 now Assistant Professor, Virginia Commonwealth University  
 Dr. May Daher Farhat 12/1/12 – 8/15/16 now Chemistry Instructor, University of Detroit Mercy  
 Dr. Kaushik Gurunathan 9/1/12 – 08/31/13 now Director, Care Health Diagnostic Lab, Chennai  
 Dr. Laurie Heinicke 1/1/13 – 12/31/15 now writer for Medical Supply company  
 Dr. Cheng-Yen Huang 10/1/07 – 10/31/09  
 Dr. Alexander Johnson-Buck 1/1/13 – 7/31/14 now Research Assistant Professor in Internal Medicine, University of Michigan  
 Dr. Matthew Kahlscheuer 5/1/15 – 7/15/15 now Research Scientist, Apeel Sciences  
 Dr. Hui Li 9/22/16 – 9/21/17 Postdoctoral visitor from the State Key Laboratory



Dr. Xiang Li	9/1/14 – 9/15/15	of Analytical Chemistry for Life Science, Nanjing University returned to senior scientist position at Nanjing University
Dr. Paul Lund	9/1/15 – 11/30/18	now Research Scientist, Parabon NanoLabs, Inc.
Dr. Anthony Manzo	9/1/05 – 8/30/11	Postdoctoral fellow
Dr. Sarah (Liz) McDowell	9/1/08 – 8/31/09	now Research Scientist, The Aerospace Corporation in El Segundo, CA
Dr. Meredith Newby	9/1/02 – 6/30/06	then Assistant Professor of Physics, Kalamazoo College
Dr. Nibedita Pal	5/1/16 – 10/10/18	then Asst. Prof. of Physics, Clemson University
Dr. Shiamalee Perumal	8/1/07 – 5/31/08	Postdoctoral fellow, now Assistant Professor, Department of Biology, Indian Institute of Science Education and Research, Tirupati
Dr. Sethu Pitchaiya	1/1/12 – 12/31/14	now VP Customer Strategy, Tact.ai, Redwood City, California
Dr. Arlie Rinaldi	5/1/13 – 09/30/13	now postdoctoral fellow with Arul Chinnaiyan, Cancer Center, University of Michigan
Dr. David Rueda	8/1/01 – 8/31/05	now Visiting Assistant Professor of Chemistry in the Keck Science Department at Claremont McKenna College
Dr. Kamali Sripathi *	5/1/14 – 7/25/14	now Chair (Full Professor) at Imperial College London
Dr. Mohamed Sobhy	10/1/07 – 1/31/09	now postdoctoral fellow in Chemical Education at Purdue University
Dr. Krishna Suddala	5/1/14 – 9/30/16	now postdoctoral fellow at KAUST
Dr. Catherine Summers	1/1/01 – 2/28/02	postdoctoral fellow at Emory University w/ Greg Melikian, then at NIH with Jinwei Zhang
Dr. Tristan Tabouillot	9/1/10 – 12/20/12	now at Sankyo Pharma, Inc.
Dr. Gabrielle Todd	1/1/12 – 3/31/12	Senior Research Scientist of the Single Molecule Analysis in Real-Time (SMART) Center
Dr. Hannah Townsend	8/15/08 – 5/31/09	now at UM Medschool w/ Akira Ono
Dr. Julia Widom	1/10/14 – 8/2/18	now Scientist at Locus Biosciences, Inc.
		Postdoctoral fellow on NIH Path to Independence, now Assistant Professor of Chemistry at U. Oregon

*Current Sabbatical Visitor**Former Sabbatical Visitor*

Dr. Christopher Rohlman (Biochemistry, Albion College)	1/1/06 – 7/31/06 and 1/1/16 – 7/31/16
Dr. Valter Zazubovits (Physics, Concordia University, Montreal)	7/1/17 – 10/30/17

*Current Undergraduate Students*

Mr. Pujan Ajmera	from 7/1/18	Engineering student
Ms. Hailey Blinkiewicz	from 5/1/17	Biochemistry student
Ms. Jacqueline Kunesh	from 9/1/18	Biochemistry student
Ms. Alisha Spoelman	from 11/1/16	UROP student
Ms. Anna Spoto	from 9/1/17	Biochemistry student
Ms. Meike Stoldt	from 9/1/17	Biochemistry student

*Former Undergraduate Students (\* denotes member of a traditionally underrepresented group)*

Ms. Autumn Acklin *	6/1/17 – 8/1/17	SROP summer student
Ms. Maria Agostini	1/1/13 – 6/30/14	Biochemistry student; now graduate student, Vanderbilt University
Mr. Jacob Anderson	1/1/16 – 1/31/17	Cellular & Molecular Biology student
Ms. Rebecca Bartke	9/1/13 – 4/30/15	UROP student
Mr. Vivek Behera	1/1/09 – 6/1/10	Biochemistry honors thesis; then technician with Nobel laureate Carol Greider, John Hopkins; now M.D./Ph.D. student at U. Penn
Mr. Noah Chen	1/1/16 – 8/31/16	Biochemistry student
Ms. Kasia Chmielinska	6/4/03 – 11/1/03	German exchange student, FU Berlin; then graduate student TU Berlin
Mr. Solanus de la Serna	6/1/15 – 4/30/17	Biochemistry student
Mr. Williams Dixon	9/1/11 – 08/31/14	UROP student
Ms. Katelyn Doxtader	9/1/10 – 06/31/14	UROP student; now graduate student, UT Southwestern
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
Mr. Spencer Hauptert	1/1/17 – 4/30/18	Biochemistry student
Ms. Kimberly Haupt	9/1/08 – 12/31/10	UROP student
Ms. Charity Haynes *	6/1/08 – 8/1/08	SROP summer student
Ms. Qian Hou	6/1/14 – 4/30/16	Biochemistry honors thesis
Mr. Jesse Jun	9/1/07 – 5/1/09	Biochemistry honors thesis
Mr. Christopher Katanski	9/1/09 – 06/30/10	UROP student
Mr. Zaid Khatib	8/1/16 – 02/01/17	Biomedical Engineering and Engineering Physics student
Mr. Sim Choon Kiat	7/15/04 – 12/31/04	Biophysics undergraduate
Mr. Matthew Ko	1/1/14 – 05/30/14	work-study student
Mr. Jonathan Kuriakose	1/1/17 – 04/30/17	Biomolecular Science student
Mr. Liuhan Dai	7/10/17 – 1/9/18	Visiting Chemical Biology student, Nankai University
Ms. LeaAnn Love *	6/1/12 – 8/1/12	SROP summer student
Mr. Philip Ma	1/1/16 – 4/30/17	Biochemistry student
Mr. Collin Marshall *	6/1/17 – 8/1/17	SROP summer student
Mr. Mariusz Matyszewski	1/1/12 – 5/1/13	Biophysics student
Ms. Molly McNeely	5/1/17 – 4/30/18	Biochemistry 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. Jun Park	9/1/13 – 4/30/16	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. Victoria Rai	9/1/14 – 4/30/18	Biophysics student
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. David Smith	9/1/12 – 05/01/14	UROP student
Mr. Jeremy Stocks *	6/1/13 – 8/1/13	SROP summer student
Mr. Jalal Taleb	9/1/15 – 04/31/16	Neuroscience 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. Jiarui (Jerry) Wang	1/1/13 – 12/31/14	Biochemistry student
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

*Current Research Assistants*

Ms. Martina Jerant	11/21/16 – present	Lab Manager
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*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

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### *Individual Fellowships or Awards*

#### Postdoctoral Fellows

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
Dr. Julia Widom	Ruth L. Kirschstein National Research Service Postdoctoral Fellowship, Honorable Mention: UROP Outstanding Research Mentor Award, NIH K99/R00 Path to Independence Award

#### Graduate Students

Mr. John Androsavich	Cellular Biotechnology Training Program Fellowship
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. Elizabeth Cameron	Cellular Biotechnology Training Program Fellowship
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. Ameya Jalihal	Cellular & Molecular Biology Training Grant
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; Kasimir Fajans best-thesis Award of the Chemistry Department for the 2012-2013 time frame
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
Ms. Jieming Li	Travel Grant from the Biophysical Society
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 &amp; 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 <sup>st</sup> prize oral presentation in the biosciences, Emerge Workshop 2005

#### Undergraduates

Ms. Maria Agostini	Chemistry Summer Undergraduate Research Fellowship
Ms. Kasia Chmielinska	German DAAD Study Abroad Fellowship
Mr. Solanus de la Serna	Chemistry Summer Undergraduate Research 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, twice
Mr. Jesse Jun	Alumni Outstanding Award for 3 <sup>rd</sup> Year Student
Ms. Rachel Leslie	Chemistry & Biology Interface Training Grant
Mr. Philip Ma	Chemistry Summer Undergraduate Research Fellowship
Mr. Jun Park	UROP Summer Undergraduate Research Fellowship and Chemistry Summer Undergraduate Research Fellowship
Ms. Victoria Rai	Top oral presentation of UROP's Research Scholars program
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

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- 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

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### *Departmental Committees*

Computer Committee	1999 – 2000
Gomberg Lecture Committee	1999 – 2005
Chemistry Graduate Recruiting Committee	2000 – 2005; 2006 – 2008; 2012 – 2015, 2017 – 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)
Space Planning Committee	2005
Nanoscience Search Committee (joint with Physics)	2005 – 2006
Biophysics Curriculum Committee	2005 – 2007
Presidential postdoc mentoring committee, Aaron Frank	2014 – 2016
Ad hoc (tenure promotion) committees	Hashim Al-Hashimi (promoted), Kicki Hakansson (promoted), Kevin Kubarych (promoted), Katrin Karbstein (Chair 2009-2010; then she moved to Scripps Florida), Julie Biteen (Chair 2010-ongoing; promoted), Kaushik Rangunathan (Biological Chemistry; 2017-ongoing)
Chemistry Search Committee	2012 – 2013
Chemistry Admissions Committee	2001 – 2002; 2008; 2009 – 2011 (Chair); 2013 – 2015
Chemistry Long-range Planning Committee	2005 – 2008, 2015 – 2017
Chemistry Rackham Diversity Faculty Ally	2012 – ongoing
NextProf-Science Organizing Committee	2014 – ongoing
Chemistry Diversity Committee	2014 – ongoing
Research Faculty Mentoring Committee	2015 – 2016 (Chair)
Chemistry Undergraduate Advising Committee	2015 – 2016
Biological Chemistry Seminar Committee	2016 – 2017
Biological Chemistry Rackham Diversity Faculty Ally	2017 – ongoing
Biol. Chem. Diversity, Equity, Inclusion (DEI) Comm.	2016 – ongoing (co-Chair since 2017)
Biological Chemistry Chair's Elected Advisory Comm.	2017 – ongoing

### *Other Departmental Service*

- Currently spearheading a grassroots effort to establish the Center for RNA Biomedicine at the U-of-M; an inaugural symposium on March 25, 2016, brought 2 Nobel laureates and several other well-known speakers from the RNA field to campus, with introductory remarks from U-of-M President Schlissel; we are now in a pilot year and have raised \$400K for a seminar series, the annual symposium on “RNA in Precision Medicine” and pilot grants.
- Recently filed patent applications through the U-of-M on a revolutionary single molecule based biomarker detection technology that we are working to commercialize into a revolutionary diagnostics platform; to this end, we were awarded a Kickstart award from the Fast Forward Medical Innovation initiative of U-of-M MTRAC and several other pilot grants.
- 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 underrepresented student serving institutions and their research mentors to campus each fall for recruiting into our summer internship and graduate programs. This effort has transformed our graduate program from, on average ~1 underrepresented student per year to ~8. I was also a co-organizer of the NextProfScience Future Faculty Workshops in May 2015-2018, with the goal to diversify science at all levels.
- 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. 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, 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*

Account of Chemical Research  
 ACS Chemical Biology  
 Analytical Chemistry  
 Biochemistry  
 Bioessays  
 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  
 Journal of Physical Chemistry B  
 Nature  
 Nature Biotechnology  
 Nature Chemical Biology  
 Nature Communications  
 Nature Materials  
 Nature Methods  
 Nature Nanotechnology  
 Nature Structural and Molecular Biology  
 Nucleic Acids Research  
 Oligonucleotides  
 PLOS  
 Proceedings of the National Academy of Sciences of the USA  
 RNA  
 Scientific Reports (Nature)  
 Small

*University and External Service*

- Co-Director, Microfluidics in Biomedical Sciences Training Program at the University of Michigan, 2015-ongoing
- Member, Admissions Committee of the Michigan Post-baccalaureate Research Education Program (PREP), 2011-2015; Associate Director, 2015-ongoing
- Member, Aaron Goldstrohm (Biological Chemistry) mentoring committee; Jayakrishnan (JK) Nandakumar (MCDB) launch committee; Kaushik Choudhuri (Microbiology & Immunology) mentoring committee

- Co-organizer of the US U.S.-Brazil International Research Workshop “Non-Coding RNAs: A New Frontier in Biomedical Research”, organized by the CIC (US) and CAPES (Brazil) at the Ohio State University, Columbus, OH, in May 2015
- Affiliate Member, UM Global Reach Program in the Medical School
- Member of the UM Rackham Graduate School’s selection committees for Rackham Merit Fellowships (2014-2016) and Graduate Student Instructor awards (2014-ongoing)
- Elected member of the UM Rackham Graduate School’s Executive Committee (2017-ongoing)
- Local Lead Organizer, RNA Society meeting 2012 at the University of Michigan, Ann Arbor, with over 800 participants
- Co-organizer of the Midwest Single Molecule Workshop 2012 at the University of Michigan, Ann Arbor
- Member, Membership Committee of the RNA Society, 2011-2013
- Member, Nomination Committee of the RNA Society, 2015
- 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, 2017-05 ZRG1 EBIT-Z (90) S, SEP-ZRG1 CMT-F (01)Q, P01 2016-ZRG1 BCMB-S (41), NCI P01 ZCA1 RTRB-R (M1), Transformative R01 201905 ZRG1 BCMB-A (50) A
- Member, Research Policies Committee of the UM Senate Assembly (SACUA), 2009-2012
- 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&19<sup>th</sup>, 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 150<sup>th</sup> 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, 2015

- Grant Reviewer for the W.M. Keck Foundation and Stanford Synchrotron Radiation Lightsource
- Grant Reviewer for the Research Councils UK, 2013, 2015
- Grant Reviewer for the Army Research office, 2016
- Grant Reviewer for the European Research Council 2016

## TEACHING

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*Department of Chemistry, University of Michigan, MI, USA*  
Chem 352-353: Introductory Biochemistry Laboratory (W19)

*Department of Chemistry, University of Michigan, MI, USA*  
Chem 451: Biochemistry I for Undergraduate Students (F02, F09, F10, F11, W13, W14, W15, W16, W17, W18)

*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 455/505: Nucleic Acid Biochemistry (F09, F13, F14, F15, F16, F17)

*Department of Chemistry, University of Michigan, MI, USA*  
Chem 495: Professional Development in the Chemical Sciences (W10, W11)

*Department of Chemistry, University of Michigan, MI, USA*  
Chem 480: Instrumental Analysis Lab for Undergraduate Students (F07)

*Chemical Biology Interdepartmental Graduate Program, University of Michigan, MI, USA*  
Chem 501: Chemical Biology I (F08, F09, F10, F12)

*Department of Chemistry, University of Michigan, MI, USA*  
Chem 260: Chemical Principles for Undergraduate Students (W01, F01, F03, F04)

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

*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 520: Biophysical Chemistry I (F15)

*Biophysics Graduate Program, University of Michigan, MI, USA*  
Biophys/Chem 521: Biophysical Chemistry II (W08, W09, W10, W14, W15)

*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

