ALEXANDER B. BARNES
curriculum vitae

Assistant Professor
Department of Chemistry, Washington University in St. Louis
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Professional Positions

July, 2013-	Assistant Professor, Department of Chemistry, Washington University in St. Louis
2011-2013	Post-doctoral Research Scientist, Department of Chemistry, Stanford University Advisor: Lynette Cegelski
2011	Post-doctoral Research Scientist, Plasma Science and Fusion Center and Department of Chemistry, Massachusetts Institute of Technology. Advisors: Richard J. Temkin and Robert G. Griffin
2004-2011	Graduate Research and Teaching Assistant, Department of Chemistry, Massachusetts Institute of Technology. Advisor: Robert G. Griffin
2004	Post-baccalaureate Research Assistant, Institute for Physical Chemistry, Muenster University, Germany. Advisor: Hellmut Eckert
2002-2003	Undergraduate Research Assistant, Department of Chemistry, Washington University in St. Louis. Advisor: Sophia E. Hayes

Education

2011	Massachusetts Institute of Technology, PhD Physical Chemistry. Thesis Title: "*High-Resolution High-Frequency Dynamic Nuclear Polarization for Biomolecular Solid State NMR*"
2003	Whitman College, B.A. Chemistry with Honors

Awards and Honors

Camille Dreyfus Teacher Scholar Award, 2018
NSF CAREER Award, 2016
NIH Director's New Innovator Award, 2015
Postdoctoral Fellowship, Center for Molecular Analysis and Design at Stanford University, 2011
NSF Graduate Research Fellowship, 2005

Research Interests

- Developing dynamic nuclear polarization (DNP), including pulsed DNP, to increase nuclear magnetic resonance (NMR) sensitivity by multiple orders of magnitude;
- Establishing and improving electron decoupling to attenuate deleterious hyperfine interactions in DNP experiments;
- Implementation of spherical rotors for magic angle spinning (MAS), whereas current technology is exclusively cylindrical rotors;
- Development of room temperature MAS-DNP;
- Designing and implementing frequency-agile gyrotrons to implement chirped microwave pulses in DNP, electron decoupling, and electron paramagnetic resonance (EPR) MAS experiments, whereas other technology relies on fixed frequency sources;
- Dielectric resonators and dielectric lenses to improve electron spin control in DNP- and EPR-MAS experiments;
- Developing cryogenic MAS technology to increase thermal spin polarization by multiple orders of magnitude and to improve electronic and nuclear spin control;
- Determining the structural ensembles and molecular dynamics of protein kinase C (PKC) modulation within membranes using DNP-enhanced NMR;

- Activation of latent viral reservoirs to cure HIV/AIDS;
- High-resolution structural biology in a cellular context (with intact cells).

Publications

After independent faculty appointment:

- **3 papers in preparation**
- **14 papers published, with 12 papers as lead (corresponding) author**

30. Alaniva N., Saliba E.P., Sesti E.L., Judge P.T., **Barnes A.B.* (2018)** Electron decoupling with dynamic nuclear polarization enables fast magnetization recovery between nuclear magnetic resonance experiments. *Manuscript in preparation for Nature Communications.*
29. Chen P.W., Gao C., Alaniva N., Saliba E.P., Sesti E.L., **Barnes A.B.* (2018)** Dielectric lenses focus microwave power into cylindrical and spherical rotors for magic angle spinning dynamic nuclear polarization. *Manuscript in preparation for Journal of Magnetic Resonance.*
28. Judge P.T., Saliba E.P., Alaniva N., Sesti E.L., Halbritter T., Sigurdsson S.T., **Barnes A.B.* (2018)** Characterization of biradicals for dynamic nuclear polarization below 6 K. *Submitted to Physical Chemistry Chemical Physics.*
27. Scott F.J., Alaniva N., Sesti E.L., Golota N.C., Albert B.J., Price L., Chen P.W., Gao C., Saliba E.P., O'Connor R.D., **Barnes A.B.*** (**2018**) A versatile cryostat for dynamic nuclear polarization NMR supports multiple cryogenic magic angle spinning transmission line probes. *Journal of Magnetic Resonance. 297,23-32.*
26. Chen P.W., Albert B.J., Gao C., Alaniva N., Price L., Scott F. J., Saliba E.P., Sesti E.L., Fisher E.W., **Barnes A.B.*** (**2018**). Magic angle spinning spheres. *Science Advances*. *4(9). 1-7.* DOI: 10.1126/sciadv.aau1540
25. Saliba E.P., Golota N.C., Sesti E.L., Alaniva N., Scott F.J., Albert B.J., Chen P.W., **Barnes A.B.*** (**2018**) Pulsed electron decoupling and time domain dynamic nuclear polarization with chirped microwave pulses. *Journal of Physical Chemistry Letters. (selected for ACS Editor's Choice) 9 (18) 5539-5547.* DOI: 10.1021/acs.jpclett.8b01695
24. Sesti E.L., Saliba E.P., Alaniva N., Albert B.J., Scott F.J., **Barnes A.B.*** (**2018**) Electron decoupling with cross polarization and dynamic nuclear polarization <6 K. Journal of Magnetic Resonance. ***Cover article.*** *Accepted, in press.* DOI: 10.1016/j.jmr.2018.07.016
23. Albert B.J., Gao C., Sesti E.L., Saliba E.P., Alaniva N., Scott F.J., Sigurdsson S., **Barnes A.B.*** (**2018**) Dynamic nuclear polarization NMR in human cells using fluorescent polarizing agents. Biochemistry. *57, 13, 4741-4746.* DOI: 10.1021/acs.biochem.8b00257
22. Scott F.J., Sesti E.L., Choi E.J., Laut A.J., Sirigiri J.R., **Barnes A.B.*** (**2018**) Magic angles spinning NMR with metallized rotors as cylindrical microwave resonators. Magnetic Resonance Chemistry. (January) 1-5. DOI: 10.1002/mrc.4744
21. Scott F.J., Saliba E.P., Albert B.J., Alaniva N., Sesti E.L., Gao C., Golota N.C., Choi E.J., Jagtap A.P., Wittmann J., Eckardt M., Harneit W., Corzilius B., Sigurdsson S., **Barnes A.B.*** (**2018**) Frequency-agile gyrotron for electron decoupling and pulsed dynamic nuclear polarization. Journal of Magnetic Resonance. 289, 45-54.
20. Yang H., Staveness D., Ryckbosch S.M., Axtman A.D., Loy B.A., **Barnes A.B.**, Pande V.S., Schaefer J., Wender P.A., Cegelski L. (**2018**) REDOR NMR Reveals Multiple Conformers for a Protein Kinase C Ligand in a Membrane Environment. ACS Central Science, 4, 89-96.
19. Sesti E.L., Alaniva N., Rand P.W., Choi E.J., Albert B.J., Saliba E.P., Scott F.J., **Barnes A.B.*** (**2018**) Magic angle spinning NMR below 6 K with a computational fluid dynamics analysis of fluid flow and temperature gradients. Journal of Magnetic Resonance, 286, 1-9.
18. Albert B., Pahng S., Alaniva N., Rand P.W., Sesti E.L., Saliba E.P., Scott F., Choi E.J., **Barnes A.B.*** (**2017**) Instrumentation for cryogenic magic angle spinning dynamic nuclear polarization using 90 L of liquid nitrogen per day. Journal of Magnetic Resonance, 283, 71-78.
17. Albert B., Niu A., Ramini R., Marshall G., Wender P.A., Williams R.M., Ratner L., **Barnes A.B.***, Kyei G.B.* (**2017**) Combinations of isoform-targeted histone deacetylase inhibitors and bryostatin analogs

display remarkable potency to activate latent HIV without global T-cell activation. Scientific Reports, 7, 7456. DOI: 10.1038/s41598-017-07814-4. PMCID: PMC5547048

16. Saliba E.P., Sesti E.L, Scott F.J., Albert B.J., Choi E.J., Alaniva N., Gao C., **Barnes A.B.*** (**2017**) Electron decoupling with dynamic nuclear polarization in rotating solids. Journal of the American Chemical Society, 139(18), 6310-6313. DOI: 10.1021/jacs.7b02714
15. Ni Q.Z, Markhasin E, Can T.V, Corzilius B, Tan KO, **Barnes A.B**, Daviso E, Griffin R.G. (**2017**) Peptide and protein dynamics and low-temperature/DNP magic angle spinning NMR. The Journal of Physical Chemistry B, 121 (19), 4997-5006.
14. Hoff D.E., Albert B.J., Saliba E.P., Scott F.J., Choi, E.J., Mardini M., **Barnes A.B.*** (**2015**) Frequency swept microwaves for hyperfine decoupling and time domain dynamic nuclear polarization. Solid State Nuclear Magnetic Resonance, 72, 79-89. DOI: 10.1016/j.ssnmr.2015.10.001. PMCID: PMC4762658

Published prior to appointment at Washington University:

13. Jawla S., Ni Q.Z., **Barnes A.B.**, Guss W., Daviso E., Herzfeld J., Griffin R.G., Temkin R.J. (2013) Continuously tunable 250 GHz gyrotron with a double disk window for DNP-NMR spectroscopy. Journal of Infrared, Millimeter and Terahertz Waves, 34, 42-52. PMCID: PMC3607393
12. **Barnes A.B.**, Markasin E., Daviso E., Michaelis V.K., Mena E., DeRocher, R., Thakkar A., Nanni E.A., Jawla S., Woskov P., Herzfeld J., Temkin R.J., Griffin R.G. (2012) Dynamic nuclear polarization at 700 MHz/460GHz. Journal of Magnetic Resonance, 224, 1-7. **(Cover Article)** PMCID: PMC3965575
11. **Barnes A.B.**, Nanni A. N, Herzfeld, J., Griffin R.G., Temkin R.J. (2012) A 250 GHz gyrotron with a 3 GHz tuning bandwidth for dynamic nuclear polarization. Journal of Magnetic Resonance, 221, 147-153. PMCID: PMC3405196
10. Smith A.A., Corzilius B., **Barnes A.B.**, Maly T., Griffin R.G. (2012) Solid effect dynamic nuclear polarization and polarization pathways. Journal Chemical Physics, 136, 015101. PMCID: PMC3265031
9. Corzilius B., Smith A.A., **Barnes A.B.**, Luchinat C., Bertini I., Griffin R.G. (2011) High field dynamic nuclear polarization with high-spin transition netal ions. Journal American Chemical Society, 133, 5648-5651. PMCID: PMC3086350
8. Nanni E.A., **Barnes A.B.**, Matsuki Y., Woskov P., Corzilius B., Griffin R.G., Temkin R.J. (2011) Microwave field distribution in a magic angle spinning dynamic nuclear polarization probe. Journal of Magnetic Resonance, 210, 16-23. PMCID: PMC308142
7. Nanni E.A., **Barnes A.B.**, Griffin R.G., Temkin R.J. *(2011)* THz dynamic nuclear polarization NMR. IEEE Transactions on Terahertz Science and Technology, 1, 145-163.
6. Debelouchina G., Bayro M., van der Wel P., Caporini M., **Barnes A.B.**, Rosay M., Maas W., Griffin R.G. (2010) Dynamic nuclear polarization-enhanced solid-state NMR spectroscopy of GNNQQNY nanocrystals and amyloid fibrils. Physical Chemistry Chemical Physics, 12, 5911-5919. PMCID: PMC4440577
5. Torrezan A.C., Han S-T., Mastovsky I., Shapiro M.A., Sirigiri J.R., Temkin R.J., **Barnes A.B.**, Griffin R.G. (2010) Continuous-wave operation of a frequency-tunable 460-GHz second-harmonic gyrotron for enhanced nuclear magnetic resonance. IEEE Transactions on Plasma Science, 38, 1150-1159.
4. **Barnes A.B.**, Andreas L.B., Huber M., Ramachandran R., van der Wel P.C.A., Veshtort M., Griffin R.G., Mehta M.A. (2009) High-resolution solid-state NMR structure of alanyl-prolyl-glycine. Journal of Magnetic Resonance, 200(1), 95-100. PMCID: PMC4133121
3. **Barnes A.B.**, Mak-Jurkauskas M.L., Matsuki Y., Bajaj V.S., van der Wel P.C.A., DeRocher R., Bryant J., Sirigiri J.R., Temkin R.J., Lugtenburg J., Herzfeld J., Griffin R.G. (2009) Cryogenic sample exchange NMR probe for magic angle spinning dynamic nuclear polarization. Journal of Magnetic Resonance, 198(2), 261-270. **(Cover Article)** PMCID: PMC2957365
2. Bertmer M., Nieuwendaal R.C., **Barnes A.B.**, Hayes S.E. (2006) Solid-state photodimerization kinetics of alpha-trans-cinnamic acid to alpha-truxillic acid studied via solid-state NMR. Journal of Physical Chemistry B, 110 (12), 6270-6273.
1. Calhoun A., Nicholson P., **Barnes A.B.** (2006) The use of inverse gas chromatography to study surface thermal oxidation of polypropylene. Polymer Degradation and Stability, 91(9), 1964-1971.

Patents

1. **Barnes A.B.** Spinning spheres for magnetic resonance. US Provisional Patents (62/703,278 and 62/672,840)
2. **Barnes A.B.** Integrated EPR NMR with frequency agile gyrotron. Pub. Number #US10113984B2
3. **Barnes A.B.**, Kyei G., Albert B. US Patent. Combinations of isoform targeted histone deacetylase inhibitors and analogs of protein kinase C modulators for HIV latency

Oral Presentations and Speaker Invitations ***since starting independent academic position*** **(40 total)**

External:

1. **Washington, DC Regional NMR Meeting.** "Magic Angle Spinning Spheres, Electron Decoupling with CPMAS below 6 K, and DNP in Human Cells with Fluorescent Polarizing Agents". Invited keynote oral presentation. November 9th, 2018.
2. **American Chemical Society** Midwest Regional Meeting. "Magic Angle Spinning Spheres, Electron Decoupling with CPMAS below 6 K, and DNP in Human Cells with Fluorescent Polarizing Agents". Invited oral presentation. October 22nd, 2018.
3. **Stanford University**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for In-cell Structural Biology". October 16th, 2018.
4. **Stanford University**, Stanford Linear Accelerator (SLAC). "Minding the (THz) gap: Microwave, cryogenic, and pneumatic instrumentation development for magnetic resonance". October 15th, 2018.
5. **University of Illinois-Urbana-Champaign**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for In-cell Structural Biology". October 10th, 2018.
6. **Purdue University**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for In-cell Structural Biology". October 2nd, 2018.
7. **Yale University**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for In-cell Structural Biology". September 25th, 2018.
8. **Massachusetts Institute of Technology,** Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for In-cell Structural Biology". September 18th, 2018.
9. **Massachusetts Institute of Technology,** Plasma Science and Fusion Center. "Minding the (THz) gap: Microwave, cryogenic, and pneumatic instrumentation development for magnetic resonance". September 17th, 2018.
10. **International Council on Magnetic Resonance in Biological Systems** (ICMRBS). Selected oral presentation. "Magic Angle Spinning Spheres, Electron Decoupling with CPMAS below 6 K, and DNP in Human Cells with Fluorescent Polarizing Agents". August 23rd, 2018.
11. **Rocky Mountain Conference** on Magnetic Resonance. Selected oral presentation. "Magic Angle Spinning Spheres, Electron Decoupling with CPMAS below 6 K, and DNP in Human Cells with Fluorescent Polarizing Agents". July 25th, 2018.
12. **National High-field Magnet Laboratory**, Florida State University. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for High Resolution NMR". March 13th, 2018.
13. **University of Florida** at Gainsville, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for High Resolution NMR". March 12th, 2018.
14. **University of California-Davis**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves for High Resolution NMR". December 4th, 2017.
15. **Eastern Analytical Society Conference**, Solid State NMR Session. Invited Speaker. "Electron Decoupling with Dynamic Nuclear Polarization in Rotating Solids". November 14th, 2017.
16. **University of Wisconsin-Madison**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Frequency-Swept Microwaves for High-Resolution NMR". November 9th, 2017.
17. **Chicago Area NMR Discussion Group. "**Electron Decoupling and Pulsed DNP in Rotating Solids at 7 Tesla and 4.2 Kelvin". November 4th, 2017.
18. **Leibniz Research Institute for Molecular Pharmacology**, Berlin, Germany. "Electron Decoupling and Pulsed DNP in Rotating Solids at 7 Tesla and 4.2 Kelvin". October 27th, 2017.

19. **Technical University Munich**, Germany. "Electron Decoupling and Pulsed DNP in Rotating Solids at 7 Tesla and 4.2 Kelvin". October 26th, 2017.
20. **Leipzig University**, Germany. "Electron Decoupling and Pulsed DNP in Rotating Solids at 7 Tesla and 4.2 Kelvin". October 25th, 2017.
21. **Max Planck Institute** for Biophysical Chemistry, Gottingen, Germany. "Electron Decoupling and Pulsed DNP in Rotating Solids at 7 Tesla and 4.2 Kelvin". October 24th, 2017.
22. **Goethe-University Frankfurt**, Germany. "Electron Decoupling and Pulsed DNP in Rotating Solids at 7 Tesla and 4.2 Kelvin". October 23rd, 2017.
23. **UMSL**, University of Missouri in St. Louis, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Frequency-Swept Microwaves for High-Resolution NMR". October 16th, 2017.
24. **University of California-Irvine**, Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Frequency-Swept Microwaves for High-Resolution NMR". October 10th, 2017
25. **University of California-Riverside,** Department of Chemistry. "Dynamic Nuclear Polarization and Electron Decoupling with Frequency-Swept Microwaves for High-Resolution NMR". October 9th, 2017
26. **Iowa State University**, Department of Chemistry. Invited Seminar. "Dynamic Nuclear Polarization and Electron Decoupling with Frequency-Swept Microwaves for High-Resolution NMR". October 7th, 2017.
27. **Telluride Workshop** on Emerging Methodologies for Paramagnetic NMR and Dynamic Nuclear Polarization in Biological and Inorganic Materials. Invited speaker. "Electron Decoupling with Frequency Agile Gyrotrons". July 24th, 2017.
28. **ISMAR**; Conference of the International Society of Magnetic Resonance. Contributed oral presentation. "Electron Decoupling with Frequency Agile Gyrotrons, MAS Below 15 Kelvin, Fluorescent Biradicals, and DNP in Human Cells". July 23rd, 2017.
29. **Euromar**. Contributed oral presentation. "Electron Decoupling with Frequency Agile Gyrotrons, Fluorescent DNP Polarizing Agents, and DNP in Human Cells". July 5th, 2017.
30. **ENC**; Experimental NMR Conference. Invited Speaker. "Technology for Hyperfine Decoupling and Time Domain DNP in Rotating Solids". March, 2017.
31. **Southeastern Magnetic Resonance Conference**. Invited Speaker. "Technology for Hyperfine Decoupling and Time Domain DNP in Rotating Solids". October 9th, 2016.
32. **Rocky Mountain Conference** on Magnetic Resonance. Selected Oral Presentation. "Technology for Hyperfine Decoupling and Time Domain DNP in Rotating Solids". July 19th, 2016.
33. **Saint Louis University**. Invited Seminar. "Using Microwaves to Boost NMR Signals for Biomolecular Structure and Dynamics". February 5th, 2016.
34. **Great Plains Regional Annual Symposium on Protein and Biomolecular NMR** (GRASP). Invited oral presentation. "Dynamic Nuclear Polarization Development for Membrane Protein Ligand Structure". October 18, 2014.
35. **American Chemical Society** 69th Southwest Regional Meeting. Invited oral presentation. "Dynamic Nuclear Polarization with Frequency Tunable Gyrotrons". November 17th 2013.

Internal:

1. **Biophysical Evenings.** Dept. of Biochemistry and Molecular Biophysics, Washington University School of Medicine. Invited seminar. "TBD". September 11th, 2018.
2. **Department of Chemistry**. "Dynamic Nuclear Polarization and Electron Decoupling with Pulsed Microwaves to Characterize Protein Kinase C Regulation". February 1st, 2018.
3. **WUSTL Biochemistry Retreat**. Keynote Speaker. "Using Microwaves to Boost NMR Signals for Biomolecular Structure and Dynamics". October 23rd, 2015.
4. **ACS Award Symposium** at WUSTL for Sophia Hayes. Invited Speaker. "Frequency Swept Microwaves for Dynamic Nuclear Polarization". October 15th, 2015.
5. **Biophysical Evenings.** Dept. of Biochemistry and Molecular Biophysics, WU School of Medicine. Invited seminar. "Dynamic Nuclear Polarization NMR for Membrane Protein Ligand Structure". October 8th 2013.

Research Support ($3,492,550 total)

Current:

Camille Dreyfus Teacher-Scholar Award 05/01/18 – 05/01/23
Dreyfus Foundation **$75,000**
Magnetic Resonance Technology for In-cell NMR Structural Determination of HIV Latency Reversal Agents
This award supports our primary research directive of performing pulsed DNP and electron decoupling in a cellular context to further HIV cure research. Structural analysis of HIV latency reversal agents with in-cell MAS-DNP will be combined with molecular biology techniques to correlate pharma-molecular structures with target phenotype.

NSF 1553577 (Barnes, PI) 08/01/16 – 07/31/21
NSF **$690,578**
CAREER: Structural Biology in a Cellular Context with High-sensitivity NMR
The primary goal of this project is to implement DNP within human tissue for in-cell NMR structure determination. A boost in NMR signal strength of >10,000 will enable the study of structural biology at an atomic level in a cellular context. This will be the first demonstration of *in situ* DNP-NMR signal enhancements within eukaryotic cells, and experiments will be performed at extreme cryogenic temperatures.

1DP2OD021207-01 (Barnes, PI) 09/30/15 – 06/30/20
NIH **$2,230,000**
High-Sensitivity NMR at Room Temperature for Molecular Structure and Dynamics
The goal of this project is to develop solid-state DNP to achieve NMR signal enhancements of >200 at room temperature. Developments in DNP technology and methods will be required to achieve significant DNP enhancements of MAS-NMR experiments at room temperature.
Administrative supplement for Alzheimer's disease and related dementias (ADRD): 09/30/18 – 09/29/19
NIH (supplement to DP2) **$389,494**
Detailed knowledge of the molecular interactions between bryostatin and residues within the binding pocket of PKCα and PKCε will provide a structural basis for rational design of bryostatin analogs. Such analogs of the natural product will provide an avenue to improve efficacy and reduce toxicity, widening the therapeutic window for treatments of ADRD.

Completed:

NSF 1521314 (Sirigiri, PI) 07/01/15 – 06/30/16
NSF **$89,978**
STTR Phase 1: Probe for High Field DNP at Room Temperature
The primary goal of this project was to develop a MAS rotor resonance structure with a high microwave quality factor of ~100 to increase EPR performance in high-resolution NMR. The resonance structure also separated the magnetic and electric components of the microwave field to reduce sample heating in high-loss dielectric materials.

Internal Award (Barnes/Foston, PIs) 6/1/15 – 7/30/16
SEAS Collaboration Initiation Grant **$7,500** (Barnes' award)
Novel NMR and EPR Technology for Surface Characterization of Biomass
The primary goal of this project was to demonstrate significant selective DNP-NMR enhancements on the surfaces of biomass in cryogenic MAS-NMR experiments at 90 K. The enhanced NMR sensitivity was used to determine contacts between cellulose and cellulase.

15-021M (Barnes, PI) 5/22/15 – 3/30/16
Washington University Molecular Imaging Center **$10,000**

1000-fold Sensitivity Enhancement and Organelle Contrast of In-cell NMR
The primary goal of this project was to develop technology to enable in-cell NMR characterization of biomolecules in a sensitive and organelle-selective manner.

Service, Professional Activities and Committees

External:

2018 Scientific review committee for NIH. CSR-ZRG1 CVRS-H 50 R Special Emphasis Panel
2018 Scientific reviewer for ACS Petroleum Research Fund
2017 Scientific review committee for NSF. MRI-CHE
2017 Scientific review committee for NIH. ZRG1 IMST-L (10) B Small Business: Bioanalytical Chemistry, BioPhysics and Assay Development
2013-present Reviewer for manuscripts submitted to: *Journal of the American Chemical Society, Angewante Chemie, Journal of Magnetic Resonance, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Journal of Chemical Physics, Magnetic Resonance in Chemistry, Solid State Nuclear Magnetic Resonance, Concepts in Magnetic Resonance*

Internal:

2016-present NMR and EPR facility committee, Department of Chemistry
2015-present Co-chair of St. Louis NMR discussion group (ACS-funded lecture series with national recognition)
2014-present Steering committee: Biochemistry, Biophysics and Structural Biology, WU School of Medicine
2014-present Machine shop committee (chair), Department of Chemistry
2013-present Admission committee, Department of Chemistry
2013-present Website committee, Department of Chemistry

Professional Memberships

International Society of Magnetic Resonance (ISMAR)
American Association for the Advancement of Science (AAAS)
American Chemical Society (ACS)
Institute of Electrical and Electronic Engineers (IEEE)

Teaching Responsibilities

Thermodynamics (Chemistry 402), Washington University in St. Louis, St. Louis MO
Hours Lectured: 170; Spring 2014, 2015, 2016, 2017, 2018
Student Evaluations: Teaching rated 6.1 out of 7.0 (average over 5 years)

Electron Paramagnetic Resonance and Dynamic Nuclear Polarization (Chemistry 5762), Washington University in St. Louis, St. Louis MO
Hours Lectured: 39; Fall 2016
Student Evaluations: Teaching rated 4.6 out of 5.0

Freshman Seminar in Chemical Sciences (Chemistry 181),
Washington University in St. Louis, St. Louis MO
Course instructor (2015, 2017), Hours Lectured: 5; Fall 2014, 2015, 2017
Student Evaluations: Teaching rated 6.6 out of 7.0