

Joseph John Henry Ackerman

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- Birth:** Tulsa, Oklahoma, July 17, 1949
- Education:** B.A. Boston University, 1972
Ph.D. Colorado State University, 1977 (Physical Chemistry)
Thesis Title: "Silver-109 Nuclear Magnetic Resonance"
Thesis Advisor: Professor Gary E. Maciel
- Professional History:**
- 1998-present William Greenleaf Eliot Professor of Chemistry, Washington University, St. Louis, MO.
 - 1995-present Professor of Radiology, Washington University School of Medicine, St. Louis, MO.
 - 1992-present Research Professor of Chemistry in Medicine, Washington University School of Medicine, St. Louis, MO
 - 1988-present Chairman and Professor of Chemistry, Washington University, St. Louis, MO.
(Appointments held jointly, Chemistry appointments are primary and tenured)
 - 1986 - 1992 Research Associate Professor of Chemistry in Medicine, Washington University School of Medicine, St. Louis, MO.
 - 1985 - 1988 Associate Professor of Chemistry, Washington University, St. Louis, MO.
 - 1980 - 1986 Research Assistant Professor of Chemistry in Medicine, Washington University School of Medicine, St. Louis, MO.
 - 1979 - 1985 Assistant Professor of Chemistry, Washington University, St. Louis, MO.
 - 1978 - 1979 NIH Postdoctoral Fellow, Department of Biochemistry, University of Oxford, Oxford, England.
Fellowship Advisors: George K. Radda and Sir Rex Richards
 - 1977 - 1978 Postdoctoral Research Associate, Department of Chemistry, Colorado State University, Fort Collins, CO.
Postdoctoral Research Advisor: Professor Gary E. Maciel.

- Honors and Awards:** Member, Board of Trustees, Sigma-Aldrich Foundation
 Fellow, Academy of Sciences of St. Louis, 2003.
 Associate Editor, *Journal of Magnetic Resonance*, 1999-present.
 Fellow, International Society for Magnetic Resonance in Medicine, 1997.
 Member, Editorial Board, *In Vivo*, International Journal of *In Vivo* Research, Athens, Greece; 1994-99.
 Gold Medal Award, (International) Society of Magnetic Resonance in Medicine, 1992.
 President, Dan Broida/Sigma-Aldrich Corporation Scholarship Fund, Inc., 1989-
 William Simpson Award for Excellence in Experimental Oncology, Department of Internal Medicine, Division of Hematology and Oncology Wayne State University. Presented at the 21st Annual Detroit Cancer Symposium, April, 1989.
 Member, Editorial Board, *Concepts in Magnetic Resonance: An Educational Quarterly*, NMR Concepts, Kingston, RI; 1989-94.
 Member, Editorial Board, *NMR In Biomedicine*, Heyden and Son, London; 1987-2003.
 St. Louis Award, St. Louis Section of the American Chemical Society, 1987.
 Regular member, Biophysical Chemistry Study Section B, 1987-89
 Vice President, Dan Broida/Sigma-Aldrich Corporation Scholarship Fund Inc., 1984-89.
 National Institutes of Health Postdoctoral Fellowship (University of Oxford), 1978-79.
 NATO Graduate Student Overseas Travel Award (C.S.U.)
 Kodak Graduate Student Fellowship (C.S.U.)
 National Science Foundation Undergraduate Research Program participant (M.I.T.)
- Reviewer and Referee:**
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|--------------------------------------|---|
| American Chemical Society | National Science Foundation |
| National Institutes of Health | NMR in Biomedicine |
| Medical Research Council (CAN) | Soc. of Magnetic Resonance in Medicine |
| Veterans Administration | American Journal of Physiology |
| Analytical Biochemistry | Biochemical Pharmacology |
| Biochemistry | Biochimica et Biophysica Acta |
| Biophysical Journal | Biopolymers |
| Calcified Tissue International | Circulation |
| CRC Press, Inc. | Inorganic Chemistry |
| Journal of Biological Chemistry | J. of Free Radical Biology and Medicine |
| Journal of Magnetic Resonance | Journal of Magnetic Resonance Imaging |
| Journal of Neurochemistry | Journal of Physical Chemistry |
| J. of the American Chemical Soc. | Magnetic Resonance in Medicine |
| Magnetic Resonance Imaging | Nature |
| Nature Biotechnology | New England Journal of Medicine |
| NMR in Biomedicine | Pediatric Research |
| Proc. Natl. Acad. of Science, U.S.A. | Science |

- Advisory Committees:**
- External Advisory Committee for the Small Animal Imaging Center, Memorial Sloan Kettering Cancer Center, New York, NY, 2003-present.
 - External Advisory Committee for the Small Animal Imaging Center, Northwestern University, Evanston, IL, 2003-present.
 - External Advisory Committee for the Center for Magnetic Resonance Research at the University of Minnesota School of Medicine, 1999-present.
 - Member, External Department-Review Committee, Chemistry Department, Southern Illinois University, Carbondale, Carbondale, IL, November 28-29, 2000.
 - External Advisory Committee for the Center for Advanced Biomedical Imaging Facility at Ohio State University (past member).
 - External Advisory Committee of the National High Magnetic Field Laboratory at the University of Florida (past member).
 - External Advisory Committee of the Southwest *In Vivo* Spectroscopy Facility at the University of Texas Health Science Center at Dallas (past member).
 - External Advisory Committee of the NMR Imaging and Spectroscopy *In Vivo* Resource at the University of Florida College of Medicine (past member and chairman).
 - External Advisory Committee of the Syracuse University NIH Resource for Multi-Nuclei NMR and Data Processing (past member).
 - External Advisory Committee of the Magnetic Resonance Center at Baylor College of Medicine (past member).
 - External Advisory Committee of the NMR Center at Harper Hospital and Wayne State University (past member).
- Conference and Society Positions**
- Council Chair, Institute for Molecular Imaging Science, Academy of Molecular Imaging (2007-2010)
 - Vice Chair, In Vivo MR Gordon Conference, 2006; (Chair Elect 2008).
 - Co-Chair, Society for Molecular Imaging, Third Annual Meeting, September 12, 2004, St. Louis, MO.
 - President, Dynamic MR Spectroscopy Study Group, International Society of Magnetic Resonance in Medicine, 2001-2003.
 - Member, Initiating Organizational Committee, Gordon Conference, on "*In Vivo* Magnetic Resonance", Andover, New Hampshire, August 21-25, 2000.
 - Member, Organizational Committee, ISMRM Cancer Workshop, Geiranger, Norway, August 10-13, 2000.
 - Chair and chief organizer, National Cancer Institute Workshop "Focus Group on MRS in Clinical Oncology", sponsored by the National Institutes of Health, Bethesda, Maryland, April 22-23, 1999.
 - Chair and chief organizer, International Society for Magnetic Resonance in Medicine's workshop, "Magnetic Resonance in Experimental and Clinical Cancer Research", held in St. Louis, Missouri, November 13-15, 1998.
 - President, ISMRM, Cancer MR Study Group, 1998-1999.
 - Member, ISMRM Long Range Planning Committee, 1996-98.
 - Chair, ISMRM Young Investigator Award Committee, 1995-96.
 - Member, Executive Committee, Experimental NMR Conference (ENC), Inc, 1988-91.

Member Board of Trustees, Society of Magnetic Resonance in Medicine, 1986-89.

**University
Committees**

Member, Search Committee for Chair of Biology, 2008-2009
Member, Advisory Committee on Women Faculty, 2008-2009
Member, Radiation Science Executive Committee, 2007-
Member, Task Force on Undergraduate Education in the Life Sciences
Member, Search Committee for Chair of Biochemistry Department, 2004-2006.
Member, Arts & Sciences Academic Planning Committee (ATP), 1998-2008.
Chairman, Washington University Ad Hoc Advisory Committee on the
MetroLink Rail System, 1997-2002.
Chairman, Search Committee for Chair of the Biology Department, 1996-98.
Member, Executive Council Division of Natural Sciences & Mathematics,
1995-
Member, Executive Council, Division of Biology & Biomedical Sciences, 1992-.

**Professional
Societies:**

American Chemical Society
International Society of Magnetic Resonance in Medicine
Society for Molecular Imaging
Academy of Molecular Imaging

**Research
Interests:**

Our work is concerned primarily with the development and application of magnetic resonance spectroscopic and imaging techniques for the study of evolving physiologic events and the biophysics underlying such events in intact biological systems. Such systems range from isolated cell preparations, to whole animals including man. Advantages of magnetic resonance for physiologic analysis include its inherently noninvasive and nondestructive nature and its ability to provide a simultaneous multicomponent metabolic analysis with chemical identity defined *via* the chemical shift. Variations of magnetic resonance imaging pulse sequences allow tissue characterization and dynamic phenomena to be explored.

Current research emphasis can be divided conceptually between the development of new technical and instrumental strategies and applications to problems of both a basic and clinical nature. The former include: (i) intracellular and extracellular compartment resolution, (ii) magnetic field gradient and radiofrequency coil structures, (iii) ^1H NMR diffusion imaging, and (v) Bayesian probability analysis of time domain NMR signals. The latter encompass a range of physiologic studies, for example: (i) determination of the biophysical basis for the marked development of diffusion weighted image contrast immediately following brain injury, (ii) determination of the evolving neurologic deficits in transgenic mouse models of human neurodegenerative disease, (iii) detection of cancer and monitoring of treatment in small animal models, (iv) elucidation of the biophysical underpinnings of the magnetic resonance properties of the human brain.

PUBLICATIONS

Joseph J.H. Ackerman

1. "Improved Broad Band NMR Spectrometer Scheme", J.J.H. Ackerman and G.E Maciel, *J. Magn. Reson.*, **23**, 67-69 (1976).
2. "Effects of Complexation of Zinc(II) on Zinc-67 Chemical Shifts", G.E Maciel, L. Simeral and J.J.H. Ackerman, *J. Phys. Chem.*, **81**, 263-267 (1977).
3. "Complexation of Silver (I) with Thiourea and Tetramethylthiourea in Dimethyl-sulfoxide Solution as Studied by ^{13}C and ^{109}Ag Nuclear Magnetic Resonance Spectroscopy", P.M. Henrichs, J.J.H. Ackerman and G.E Maciel, *J. Am. Chem. Soc.*, **99**, 2544-2548 (1977).
4. "Stereochemistry of Metalation and Alkylation of Chiral Oxazolines. A ^{13}C -Nuclear Magnetic Resonance Study of Lithio Oxazolines", A.I. Meyers, E.S. Synder and J.J.H. Ackerman, *J. Am. Chem. Soc.*, **100**, 8166-8189 (1978).
5. "Effects of Halide Complexation of Cadmium(II) on Cd-113 Chemical Shifts", J.J.H. Ackerman, T.V. Orr, V.J. Bartuska and G.E Maciel, *J. Am. Chem. Soc.*, **101**, 341-347 (1979).
6. "Structural Studies of Organic Silver Complexes in DMSO by ^{13}C and ^{109}Ag NMR", P.M. Henrichs, S. Sheard, J.J.H. Ackerman and G.E. Maciel, *J. Am. Chem. Soc.*, **101**, 3222-3228 (1979).
7. "Transition Metal Catalyzed Asymmetric Organic Synthesis *via* Polymer Attached Optically Active Phosphine Ligands IV. Asymmetric Hydroformylation", S.J. Fritschel, J.J.H. Ackerman, T. Keyser and J.K Stille, *J. Org. Chem.*, **44**, 3152-3157 (1979).
8. "Analysis of Rat Heart *in Vivo* by Phosphorus Nuclear Magnetic Resonance", T.H. Grove, J.J.H. Ackerman, G.K. Radda and P.J. Bore, *Proc. Natl. Acad. Sci. USA*, **77**, 299-302 (1980).
9. "Mapping of Metabolites in Whole Animals by ^{31}P NMR Using Surface Coils", J.J.H. Ackerman, T.H. Grove, G.G. Wong, D.G. Gadian and G.K Radda, *Nature*, **283**, 167-170 (1980).
10. "NMR Studies of Metabolism in Perfused Organs", J.J.H. Ackerman, P.J. Bore, D.G. Gadian, T.H. Grove and G.K. Radda, *Phil. Trans. R. Soc. Lond. B*, **289**, 425 (1980).
11. " ^{31}P NMR Studies on Kidney Intracellular pH in Acute Renal Acidosis", G.K. Radda, J.J.H. Ackerman, P. Bore, P. Sehr, G.G. Wong, B.D. Ross, Y. Green, S. Bartlett and M. Lowery, *Int. J. Biochem.*, **12**, 277-281 (1980).
12. "Cd-113 NMR of Supercooled Aqueous Solutions", M.J.B. Ackerman and J.J.H. Ackerman, *J. Phys. Chem.*, **84**, 3151-3153 (1980).

13. "Comparative Study of Whole Seed Protein and Starch Content *via* Cross Polarization-Magic Angle Spinning C-13 NMR Spectroscopy", D.J. O'Donnell, J.J.H. Ackerman and G.E. Maciel, *J. Agri. Food Chem.*, **29**, 514-518 (1981).
14. "Observation of H-1 NMR Signals with Receiver Coils Tuned for Other Nuclides", J.J.H. Ackerman, D.G. Gadian, G.K Radda and G.G. Wong, *J. Magn. Reson.*, **42**, 498-500 (1981).
15. "A C-13 NMR Study of Four Lignins in the Solid and Solution States", G.E. Maciel, D.J. O'Donnell, J.J.H. Ackerman, B.H. Hawkins and V.J. Bartuska, *Makromol. Chem.*, **182**, 2297-2304 (1981).
16. "The Role of Intrarenal pH in Regulation of Ammoniogenesis: P-31 NMR Studies of the Isolated Perfused Rat Kidney", J.J.H. Ackerman, M. Lowery, G.K. Radda, B. Ross and G.G. Wong, *J. Physiol. (London)*, **319**, 65-79 (1981).
17. "A P-31 NMR External Reference for Intact Biological Systems", J.K Gard and J.J.H. Ackerman, *J. Magn. Reson.*, **51**, 124-127 (1983).
18. "NMR T₁ Measurements in Inhomogeneous B₁ with Surface Coils", J.L Evelhoch and J.J.H. Ackerman, *J. Magn. Reson.*, **53**, 52-64 (1983).
19. "Measurement of Sodium Association of Bicarbonate and Human Albumin By Direct Potentiometry and Na-23 Nuclear Magnetic Resonance", S.W. Graves, R.P. Compton, J.J.H. Ackerman, C.H. Smith, M.L. Landt, and J.H. Ladenson, in "*Proc. of the (N.B.S.) Workshop on Direct Potentiometric Measurements in Blood*", W.F. Koch, (Ed.), Special Publications NBS, Government Print Ofc., pgs. 117-126 (1983).
20. "Absolute Molar Concentrations By NMR in Inhomogeneous B₁: A Scheme for Analysis of *in Vivo* Metabolites", K.R. Thulborn and J.J.H. Ackerman, *J. Magn. Reson.*, **55**, 357-371 (1983).
21. "Signal-to-Noise Optimization and Observed Volume Localization with Circular Surface Coils", J.L. Evelhoch, M.G. Crowley and J.J.H. Ackerman, *J. Magn. Reson.*, **56**, 110-124 (1984).
22. "Selective Suppression of the Cranial Bone Resonance From P-31 NMR Experiments with *in Vivo* Rat Brain", J.J.H. Ackerman, J.L. Evelhoch, B.A. Berkowitz, G.M. Kichura, R.K Deuel, and K.S. Lown, *J. Magn. Reson.*, **56**, 318-322 (1984).
23. "Phosphorus-31 NMR of Rat Brain *in Vivo* with Bloodless Perfluorocarbon Perfused Rat", J.J.H. Ackerman, B.A. Berkowitz and R.K Deuel, *Biochem. Biophys. Res. Comm.*, **119**, 913-919 (1984).
24. "High Field (8.5 Tesla) C-13 NMR Spectroscopy of Tissue *in Vivo*: A Double Resonance Surface Coil Probe", N.V. Reo, C.S. Ewy, B.A. Siegfried, and J.J.H. Ackerman, *J. Magn. Reson.*, **58**, 76-84 (1984).

25. "In Vivo Metabolic Effects of Hyperglycemia In Murine Radiation Induced Fibrosarcoma: A P-31 NMR Investigation", J.L. Evelhoch, S.A. Sapareto, D.E.L Jick, and J.J.H. Ackerman, *Proc. Natl. Acad. Sci. USA*, **81**, 6496-6500 (1984).
26. "Direct Observation of Glycogenesis and Glucagon-Stimulated Glycogenolysis in the Rat Liver *in Vivo* by High Field Carbon-13 Surface Coil NMR", N.V. Reo, B.A. Siegfried, and J.J.H. Ackerman, *J. Biol. Chem.*, **259**, 13664-13667 (1984).
27. "Determination of Intact Tissue Glycerophosphorylcholine Levels by Quantitative ³¹P Nuclear Magnetic Resonance Spectroscopy and Correlation with Spectrophotometric Quantification", J.J. Billadello, J.K. Gard, J.J.H. Ackerman, and R.W. Gross, *Anal. Biochem.*, **144**, 269-274 (1985).
28. "Evidence from C-13 NMR for Polarization of the Carbonyl of Oxaloacetate in the Active Site of Citrate Synthase", L.C. Kurz, J.J.H. Ackerman, and G.R. Drysdale, *Biochem.*, **24**, 452-457 (1985).
29. "Monitoring the Time Course of Cerebral Deoxyglucose Metabolism with ³¹P NMR Spectroscopy", R.K. Deuel, W.R. Sherman, G.M. Yue, D.M. Schickner, and J.J.H. Ackerman, *Science*, **228**, 1329-1331 (1985).
30. "³¹P Spin-Lattice Relaxation Times and Resonance Linewidths of *in Vivo* Rat Tissue. Dependence Upon the Static Magnetic Field Strength", J.L. Evelhoch, C.S. Ewy, B.A. Siegfried, J.J.H. Ackerman, and R.W. Briggs, *Magn. Reson. Medicine*, **2**, 410-417 (1985).
31. "The Surface Coil NMR Receiver in the Presence of Homogeneous B₁ Excitation", M.G. Crowley, J.L. Evelhoch, and J.J.H. Ackerman, *J. Magn. Reson.*, **64**, 20-31 (1985).
32. "¹¹³Cd Chemical Shifts of Cadmium-Iodide Complexes in Supercooled Aqueous Solution", M.J.B. Ackerman and J.J.H. Ackerman, *J. Am. Chem. Soc.*, **107**, 6413-6414 (1985).
33. "Quantitative ³¹P NMR Analysis of Metabolite Concentrations in Langendorff-Perfused Rabbit Hearts", J.K. Gard, G.M. Kichura, J.J.H. Ackerman, J.D. Eisenberg, J.J. Billadello, B.E. Sobel, and R.W. Gross, *Biophys. Journal*, **48**, 803-813 (1985).
34. "Enhanced Surfaced Coil Spatial Localization with an Inhomogeneous Surface Gradient", M.G. Crowley and J.J.H. Ackerman, *J. Magn. Reson.*, **65**, 522-525 (1985).
35. "Effects of Hormone and Glucose Administration on Hepatic Glucose and Glycogen Metabolism *in Vivo*: A ¹³C NMR Study", B.A. Siegfried, N.V. Reo, C.S. Ewy, R.A. Shalwitz, J.J.H. Ackerman, and J.M. McDonald, *J. Biol. Chem.*, **260**, 16137-16142 (1985).
36. "Correlations Between ³¹P NMR Spectroscopy and ¹⁵O Perfusion Measurements in the Radiation Induced Fibrosarcoma Murine Tumor *in Vivo*", J.L. Evelhoch, S.A. Sapareto, G.H. Nussbaum, and J.J.H. Ackerman, *Radiation Research*, **106**, 122-131 (1986).

37. "Deuterium Nuclear Magnetic Resonance Spin-Imaging of D₂O: A Potential Exogenous MRI Label", C.S. Ewy, E.E. Babcock and J.J.H. Ackerman, *Magn. Reson. Imaging.*, **4**, 407-411 (1986).
38. "Proton Decoupled Fluorine NMR Spectroscopy *In Situ*", B.A. Berkowitz and J.J.H. Ackerman, *Biophys. J.*, **151**, 681-685 (1987).
39. "Deuterium Nuclear Magnetic Resonance Measurements of Hepatic Blood Flow and Tissue Perfusion Employing 2H₂O as a Freely Diffusible Tracer", J.J.H. Ackerman, C.S. Ewy, N.N. Becker and R.A. Shalwitz, *Proc. Natl. Acad. Sci. USA*, **84**, 4099-4102 (1987).
40. "Deuterium Magnetic Resonance *in Vivo*: The Measurement of Blood Flow and Tissue Perfusion", J.J.H. Ackerman, C.S. Ewy, S.-G. Kim and R.A. Shalwitz, *Ann. N.Y. Acad. Sci.*, (proceedings of the N.Y. Acad. Sci. Conf. on *Physiological NMR Spectroscopy: From Isolated Cells to Man*, September 24-26, 1986, New York, N.Y.); **508**, 89-98 (1987).
41. "Visibility of Mammalian Hepatic Glycogen to the NMR Experiment *in Vivo*", R.A. Shalwitz, N.V. Reo, N.N. Becker and J.J.H. Ackerman, *Magn. Reson. Med.*, **5**, 462-465 (1987).
42. "Quantitative Determination of Tumor Blood Flow and Perfusion *via* Deuterium NMR", S.-G. Kim and J.J.H. Ackerman, *Cancer Research*, **48**, 3449-3453 (1988).
43. "Deuterium NMR Cerebral Imaging *In Situ*", C.S. Ewy, J.J.H. Ackerman and R.S. Balaban, *Magn. Reson. Med.*, **8**, 35-44 (1988).
44. "Bayesian Analysis of Time Domain Magnetic Resonance Signals", G.L. Bretthorst, C.-C. Hung, D.A. d'Avignon and J.J.H. Ackerman, *J. Magn. Reson.*, **79**, 369-376 (1988).
45. "Multicompartment Analysis of Blood Flow and Tissue Perfusion Employing D₂O as a Freely Diffusible Tracer: A Deuterium NMR Study", S.-G. Kim and J.J.H. Ackerman, *Magn. Reson. Med.*, **8**, 410-426 (1988).
46. "Basic Concepts of High Resolution Nuclear Magnetic Resonance Spectroscopy", J.J.H. Ackerman and D.A. d'Avignon in *Medical Magnetic Resonance: A Primer-1988*, T.F. Budinger and A.R. Margulis, eds., Society of Magnetic Resonance in Medicine, Berkeley, CA (1988).
47. "³¹P NMR Bayesian Spectrum Analysis of Rat Brain *in Vivo*", G.L. Bretthorst, J.J. Kotyk and J.J.H. Ackerman, *Magn. Reson. Med.*, **9**, 282-287 (1989).
48. "Hepatic Glycogen Synthesis from Duodenal Glucose and Alanine: An *in Situ* ¹³C NMR Study", R.A. Shalwitz, N.V. Reo, N.N. Becker, C.S. Ewy, and J.J.H. Ackerman, *J. Biol. Chem.*, **264**, 3930-3934 (1989).
49. "Surface Coil Spin-Echo Localization *in Vivo via* Inhomogeneous Surface Spoiling Magnetic Gradient", W. Chen and J.J.H. Ackerman, *J. Magn. Reson.*, **82**, 655-658 (1989).

50. "Surface Coil Single-Pulse Localization *in Vivo* via Inhomogeneous Surface Spoiling Magnetic Gradient", W. Chen and J.J.H. Ackerman, *NMR in Biomedicine*, **1**, 205-207 (1989).
51. "Simultaneous *in Vivo* Monitoring of Cerebral Deoxyglucose and Deoxyglucose-6-phosphate by $^{13}\text{C}\{-^1\text{H}\}$ Nuclear Magnetic Resonance Spectroscopy", J.J. Kotyk, R.S. Rust, J.J.H. Ackerman, and R.K. Deuel, *J. Neurochem.*, **53**, 1620-1628 (1989).
52. "Non-Invasive Detection of Protein Catabolism *in Vivo* via Nuclear Magnetic Resonance Spectroscopy: Application of A Novel ^{19}F -containing Residualizing Label", A. Daugherty, N.N. Becker, L. Scherrer, B.E. Sobel, J.J.H. Ackerman, J.W. Baynes, and S.R. Thorpe, *Biochem. J.*, **264**, 829-835 (1989).
53. "Surface (Local) Coils as NMR Receivers", J.J.H. Ackerman, *Concepts in Magnetic Resonance*, **2**, 33-42 (1990).
54. "Sepsis Does Not Alter Red Blood Cell Glucose Metabolism or Intracellular Na^+ Concentration", R.S. Hotchkiss, S.-K. Song, C.S. Ling, J.J.H. Ackerman and I.E. Karl, *Am. J. Physiol.*, (Regulatory Integrative Comp. Physiol. 27), **258**, R21-R31 (1990).
55. "Measurement of Tumor Blood Flow by Deuterium Nuclear Magnetic Resonance Spectroscopy: Application to Murine RIF-1 Tumor", S.-G. Kim, Y.C. Hwang and J.J.H. Ackerman, in *Magnetic Resonance in Experimental and Clinical Oncology*, Chapter 3, pgs. 59-94, J.L. Evelhoch, W.G. Negendank, F.A. Valeriote and L.H. Baker Eds., Kluwer Academic Pub., Nowell, MA, (presented at the 21st Annual Cancer Symposium, Wayne State University., Detroit, MI, April 13-14, 1989).
56. "Quantification of Regional Blood Flow by Monitoring of Exogenous Tracer *via* Nuclear Magnetic Resonance Spectroscopy", S.-G. Kim and J.J.H. Ackerman, *Magn. Reson. Med.*, **14**, 266-282 (1990) (presented as part of the SMRM Sponsored Workshop on MR Imaging of Blood Flow, March 13-14, 1989; Philadelphia, PA).
57. "Localized $^{13}\text{C}\{-^1\text{H}\}$ NMR of Rat Liver *in Vivo* Using Surface-Spoiling Gradients", W. Chen and J.J.H. Ackerman, *NMR in Biomed.*, **2**, 267-266 (1989) [presented at the Topical Workshop on *Localized NMR Spectroscopy in Vivo: Problems Strategies and Applications*, Max-Planck Institute Für biophysikalische chemie, Göttingen, FRG, June 29-30, 1989].
58. "Spatially-Localized NMR Spectroscopy Employing an Inhomogeneous Surface-Spoiling Magnetic Field Gradient 1: Phase Coherence Spoiling Theory and Gradient Coil Design", W. Chen and J.J.H. Ackerman, *NMR in Biomedicine*, **3**, 147-157 (1990).
59. "Spatially Localized NMR Spectroscopy Employing an Inhomogeneous Surface-Spoiling Magnetic Field Gradient 2: Surface-Coil Experiments with Multicompartment Phantom and Rat *in Vivo*", W. Chen and J.J.H. Ackerman, *NMR in Biomedicine*, **3**, 158-165 (1990).

60. ^1H and ^2H NMR Studies of Water in Work-Free Wheat Flour Doughs, D.A. d'Avignon, C.-C. Hung, M.T.L. Pagel, B. Hart, G.L. Bretthorst, and J.J.H. Ackerman, in *NMR Applications in Biopolymers*, pgs. 391-414, John Finley, Ed., Plenum Press, New York (1990).
61. "Sepsis Does Not Impair the Tricarboxylic Acid Cycle in the Heart", R.S. Hotchkiss, S.-K. Song, J.J. Neil, R.D. Chen, J.K. Manchester, I.E. Karl, O.L. Lowry, and J.J.H. Ackerman, *Am. J. Physiol.*, **260** (Cell Physiol. 29), C50-C57 (1991).
62. "Modulation of Murine Radiation-induced Fibrosarcoma-1 Tumor Metabolism and Blood Flow *in Situ* via Glucose and Mannitol Administration Monitored by ^{31}P and ^2H Nuclear Magnetic Resonance Spectroscopy", Y.C. Hwang, S.G. Kim, J.L. Evelhoch, M. Seyedsadr and J.J.H. Ackerman, *Cancer Research*, **51**, 3108-3118 (1991).
63. "Magnetic Resonance RF Probe with Electromagnetically Isolated Transmitter and Receiver Coils", W. Chen and J.J.H. Ackerman, U.S. Patent No. 4,966,481 (2/26/1991).
64. "Studies of Evolving Carbohydrate Metabolism *in Vivo* by ^{13}C Surface-Coil NMR Spectroscopy", N.N. Becker and J.J.H. Ackerman, in *NMR Applications in Biopolymers*, pgs. 317-328, Eds., J.W. Finley, S.J. Schmidt and A.S. Serianni, Plenum Press, (Basic Life Sciences, Vol. 56), New York (1991).
65. "Methods Employing Deuterium for Enhancing Magnetic Resonance Imaging and Spectroscopy", J.J.H. Ackerman, U.S. Patent Application, U.S. Patent No. 5,042,488 (8/27/91).
66. ^1H and ^2H NMR Studies of Water in Work-Free Wheat Flour Doughs", D.A. d'Avignon, C.C. Hung, M.T.L. Pagel, B. Hart, G.L. Bretthorst and J.J.H. Ackerman, in *Water Relations in Foods: Advances in the 1980's and Trends for the 1990's*, Eds. H. Levine and L. Slade, Plenum Press, New York, 1991; *Adv. Exp. Med. Biol.*, **302**, 485-508 (1991).
67. "An Approach to Solving the Dynamic Range Problem in Measurement of the Pseudodiffusion Coefficient *in Vivo* with Spin Echoes", J.J. Neil, L.A. Sherrer and J.J.H. Ackerman, *J. Magn. Reson.* **95**, 607-614 (1991).
68. "Non-Glycolytic Acidification of Murine RIF-1 Tumor *via* 3-O-Methyl-D-Glucose Monitored by ^1H , ^2H , ^{13}C and ^{31}P NMR Spectroscopy", Y.C. Hwang, S.-G. Kim, J.L. Evelhoch and J.J.H. Ackerman, *Cancer Research*, **52**, 1259-1266 (1992).
69. "Detection of Pseudodiffusion in Rat Brain Following Blood Substitution with Perfluorocarbon", J.J. Neil and J.J.H. Ackerman, *J. Magn. Reson.*, **97**, 194-201 (1992).
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 141. "High Dynamic Range MRS Time-Domain Signal Analysis", G. L. Bretthorst, W. C. Hutton, J. R. Garbow, and J. J. H. Ackerman: *J. Magn. Reson.*, in revision (2009).

Lectures, Seminars and Poster Presentations

Joseph J.H. Ackerman

[* indicates invited presentation]

- *1. "P-31 NMR of Intact Tissue"; Colorado State University, Ft. Collins, CO; and Coors Container Company, Golden, CO; and Colorado College, Colorado Springs, CO; November 1979.
- *2. "High Resolution NMR Using Surface Coils. The Mapping of Metabolites in Whole Animals"; 21st Experimental NMR Conference, Tallahassee, FL; March 1980.
- *3. "High Resolution NMR of *In Vivo* Tissue"; U.C. Davis Symposium on Biological and Medical NMR Spectroscopy, Davis, CA; March 1980.
- *4. "High Resolution NMR of *In Vivo* Tissue"; University of Missouri at St. Louis, St. Louis, MO; April 1980.
5. "NMR of Supercooled Aqueous Solutions, An Approach to Model Biopolymer Systems"; Symposia on NMR of Macromolecules 22nd Rocky Mountain Conference on Analytical Chemistry, Denver, CO; August 1980.
- *6. "Metal Nuclide NMR: Chemical Shifts and Chemical Exchange"; Petrolite Corporation, St. Louis, MO; October 1980.
- *7. "High Resolution NMR of *In Vivo* Tissue"; Iowa State University, Ames, IA, December 1980.
- *8. "NMR of Intact Tissue: An Approach to *In Vivo* Biochemistry"; St. Louis University Medical Center, St. Louis, MO; March 1981.
- *9. "NMR in Supercooled Solutions: The Imposition of the Slow Exchange Regime"; 22nd Experimental NMR Conference, Asilomar, CA; April 1981.
- *10. "Intact Tissue NMR: Biochemistry of *In Vivo* and *In Vivo* Tissue"; Pathology Research Seminar, Washington University Medical School, St. Louis, MO; May 1981.
- *11. "Application of NMR to Studies of Whole Cells. An Overview"; Mini Symposium, 72nd Annual Meeting, Am. Soc. Biol. Chem., St. Louis, MO; June 1981.
- *12. "P-31 NMR *In Vitro* and *In Vivo* Using Surface Coils"; Bruker NMR Users Conference, Billerica, MA; October 1981.
- *13. "Chemical Application of Nuclear Magnetic Resonance: From Test Tube to Intact Tissue"; The Proctor and Gamble Company, Cincinnati, OH; January 1982.

14. "Nuclear Magnetic Resonance: The Chemistry of Intact Tissue"; Symposium on Non-Invasive Evaluations of Brain Function at the 13th Annual Meeting of the American Society for Neurochemistry, Grossinger, NY; March 1982.
- *15. "A New Approach to Biochemistry in Living Subjects: Nuclear Magnetic Resonance Spectroscopy of Intact Biological Systems"; Sigma Ki Lecture, Carbondale, IL; April 1982.
- *16. "High Resolution Nuclear Magnetic Resonance Spectroscopy of Intact Tissue: A novel approach to *In Vivo* Biochemistry"; Southern Illinois University at Carbondale, Carbondale, IL; April 1982.
- *17. "NMR Investigations of Cardiac Tissue"; Annual Scientific Meeting Specialized Centers of Research of Ischemic Heart Disease, Bethesda, MD; May 1982.
- *18. "Nuclear Magnetic Resonance Studies of Rabbit Myocardium"; Symposium on the Use of NMR Spectroscopy in the Study of Myocardial Physiology Annual Meeting, International Society for Heart Research - American Section, New Orleans, LA; May 1982.
- *19. "High Resolution NMR of Intact Biological Systems: The Biochemistry of *In Vivo* Tissue"; St. Jude Children's Research Hospital, Memphis, TN; June 1982.
- *20. "High Resolution NMR of Intact Biological Systems: The Biochemistry of *In Vivo* Tissue"; Baxter-Travenol Laboratories Inc., Chicago, IL; December 1982.
- *21. "High Resolution NMR of Intact Biological Systems: The Biochemistry of *In Vivo* Tissue"; Baylor School of Medicine, Houston, TX; March 1983.
- *22. "Principles of Nuclear Magnetic Resonance"; Milis Research Meeting, Division of Cardiology, Washington University School of Medicine; March 1983.
- *23. "High Resolution NMR of Intact Biological Systems: The *In Vivo* Biochemistry of Tissue"; St. Louis Soc. of Neurochemistry, St. Louis, MO; March 1983.
- *24. "High-Resolution NMR Studies of *In Vivo* and *In Vitro* Tissue Systems"; McNeil Pharmaceutical, Spring House, PA; July 1983.
- *25. "The Effect of Surface Coil B₁ Inhomogeneity on Spatial Localization and T₁ Measurements" (presented by J.L. Evelhoch); Second Annual Meeting, Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1983.
26. "*In Vivo* Metabolic Effects of Hyperglycemia in Murine RIF-1 Tumor: A P-31 NMR investigation" (presented by J.L. Evelhoch); Second Annual Meeting, Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1983.
- *27. "*In Vivo* Biochemistry Observed by Nuclear Magnetic Resonance"; The University of Texas Health Science Center at Dallas; Dallas, TX; March 1984.

28. "A High Field (8.5 Tesla) Surface Coil C-13 NMR Probe for Monitoring Cellular Metabolism of Tissue *In Vivo*" (presented by N.V. Reo); 187th National ACS Meeting, St. Louis, MO; April 1984.
29. "Absolute Quantitation of Phosphorus Metabolites in Langendorff-Perfused Rabbit Hearts by P-31 NMR" (presented by J.K. Gard); 187th National ACS Meeting St. Louis, MO; April 1984.
- *30. "Principles of Nuclear Magnetic Resonance in Cardiology"; Milis Research Meeting, Division of Cardiology, Washington University School of Medicine; April 1984.
- *31. "Investigation of the Effects (*In Vivo*) of Hyperglycemia and Hyperthermia on Tumor Biology"; The Organ Systems Program of the National Cancer Institute, Research and Clinical Applications of NMR in Cancer; New Orleans, LA; June 1984.
- *32. "Surface Coils"; Medical Applications of Magnetic Resonance, Interlaken, Switzerland; June 1984.
33. "³¹P NMR Spectroscopy of Murine RIF-1 Tumor *In Vivo*: The Effect of Tumor Composition on the Observed Spectrum" (presented by J.L. Evelhoch); Third Annual Meeting, Society of Magnetic Resonance in Medicine, New York, NY; August 1984.
34. "Composite Pulse and Homogeneous (B₁) Excitation: The Surface Coil Antenna" (presented by M.G. Crowley); Third Annual Meeting, Society of Magnetic Resonance in Medicine, New York, NY; August 1984.
35. "Monitoring Glucose and Glycogen Metabolism *In Vivo*: A High Field (8.5 Tesla) Surface Coil Carbon-13 NMR Probe" (presented by N.V. Reo); Third Annual Meeting, Society of Magnetic Resonance in Medicine, New York, NY; August 1984.
36. "2-Deoxyglucose Metabolism in the Awake Rat Brain *In Vivo*: A ³¹P NMR Investigation" (presented by G.M. Yue); Third Annual Meeting, Society of Magnetic Resonance in Medicine, New York, NY; August 1984.
- *37. "NMR In the Study of Biology *In Vivo*"; Department of Biology, Washington University, St. Louis, MO; September 1984.
- *38. "NMR Spectroscopy, Phase Shift, Imaging and Specialized Pulsing Sequences, T₁ Measurement"; Course No. 84-VJ, Workshop on Nuclear Magnetic Resonance Imaging, Veterans Administration Medical Center, St. Louis, MO; September 1984.
- *39. "NMR Spectroscopy of Evolving Metabolism"; Los Alamos National Laboratory and University of New Mexico and (NMR)² Meeting; Albuquerque, NM; November 1984.
- *40. "Application and Developments of Surface Coil Spectroscopy"; National Institutes of Health, Bethesda, MD; December 1984.

- *41. "NMR Spectroscopy of Evolving Metabolism"; Department of Physiology, University of Pennsylvania, Philadelphia, PA; January 1985.
- *42. "NMR Spectroscopy in Inhomogeneous RF Fields: Applications of Surface Coils to Biological Systems"; Department of Chemistry, Colorado State University, Ft. Collins, CO; March 1985.
- 43. "High Field ^{13}C , ^{19}F , and ^{31}P Surface Coil NMR Studies of Evolving Metabolism"; Current Status and Future of Magnetic Resonance: Medical Applications and Technologic Development, University of Tennessee, Knoxville, TN; March 1985.
- *44. "NMR Spectroscopy of Evolving Metabolism"; Upjohn Company, Kalamazoo, MI; March 1985.
- 45. "Cadmium-113 NMR of Supercooled Aqueous Solutions" (poster presented by M.J.B. Ackerman); 26th Exp. NMR Conference, Asilomar, CA; April 1985.
- 46. "Correlations Between ^{31}P NMR Spectroscopy and Tumor Perfusion in Murine RIF-1 Tumors" (presented by J. Evelhoch); 33rd Annual Meeting of the Radiation Res. and N. Am. Hyperthermia Group Soc., Los Angeles, CA; May 1985.
- 47. "2-Fluoro-2-deoxy-D-glucose (2FDG) Metabolism *In Vivo*: A ^{19}F - $\{^1\text{H}\}$ NMR Study" (poster); 4th Annual Meeting of the Soc. of Magn. Reson. in Med., London, England; August 1985.
- 48. "Surface Homo-Spoil Gradients for Elimination of Signal from Surface Tissues in the *In Vivo* NMR Experiment" (poster presented by M.G. Crowley); 4th Annual Meeting of the Soc. of Magn. Reson. in Med., London, England; August 1985.
- *49. "Multinuclear Magnetic Resonance Studies of Physiology *In Vivo*"; Department of Pharmacology, Washington University School of Medicine, St. Louis, MO; January 1986.
- *50. "Multinuclear Magnetic Resonance of Chemistry *In Vivo*"; 7th Annual NMR Symposium, Department of Chemistry, University of Delaware, Delaware, MD; June 1986.
- *51. " ^2H , ^{13}C and ^{19}F Surface Coil NMR Spectroscopy of Evolving Metabolism"; 29th Annual Meeting of the Canadian Federation of Biological Societies, Inc., Guelph, Canada; June 1986.
- *52. "Multinuclear NMR Spectroscopy of Living Systems"; Combined National Meetings of the American Association for Clinical Chemistry and the Canadian Society for Clinical Chemistry, Chicago, IL; July 1986.
- *53. "Multinuclear Magnetic Resonance Studies of Physiology *In Vivo*"; Gordon Research Conference, Magnetic Resonance in Biology and Medicine; August 1986.

54. "Hepatic Glycogen Synthesis from Duodenal Glucose and Alanine: An *In Situ* ^{13}C NMR Study" (presented by R.A. Shalwitz); 5th Ann. Meeting of the Society of Magnetic Resonance in Medicine, Montreal, Canada; August, 1986.
55. "Deuterium NMR Measurements of Blood Flow in Normal and Tumor Tissue" (presented by C.S. Ewy); 5th Ann. Meeting of the Society of Magnetic Resonance in Medicine, Montreal, Canada, August; 1986.
56. "2-Fluoro-2-deoxy-glucose Metabolism in Cerebral Tissue *In Vivo*: A ^{19}F , ^{31}P NMR Investigation" (presented by B.A. Berkowitz); 5th Ann. Meeting of the Society of Magnetic Resonance in Medicine, Montreal, Canada; August, 1986.
57. "An Indirect Proof, *In Situ* and *In Vivo*, of Uniform Hepatic Glycogen Visibility to the ^{13}C , NMR Experiment" (presented by N.V. Reo); 5th Ann. Meeting of the Society of Magnetic Resonance in Medicine, Montreal, Canada; August, 1986.
- *58. "Deuterium: An *In Vivo* Magnetic Resonance Probe"; XII International Conference on Magnetic Resonance in Biological Systems, Todtmoos, (Black Forest) Germany; September 1986.
- *59. "NMR Chemical Shift Studies of Evolving Metabolism in Small Laboratory Animals"; New York Academy of Sciences, Physiological NMR Spectroscopy: From Isolated Cells to Man, New York, NY; September 1986.
- *60. "Quantification of *In Situ* Chemistry In Living Systems"; Annual meeting of the Federation of Analytical Chemistry and Spectroscopy, Analytical NMR (Symposium), St. Louis, MO; October 1986.
- *61. "Multinuclear Magnetic Resonance of Evolving Metabolism *In Situ*"; Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy, Biophysical Applications of NMR (Symposium), St. Louis, MO; October 1986.
- *62. "Metabolism and Blood Flow: Concomitant Quantification by *In Vivo* NMR Spectroscopy"; Eastern Analytical Symposium, New York, NY; October 1986.
- *63. "NMR Spectroscopy", Continental Baking Co. Technical Affairs Management Meeting, Lake of the Ozarks, MO; October 1986.
- *64. "*In Vivo* NMR Spectroscopy", ACS North Jersey Section NMR Topical Group, East Hanover, NJ; November 1986.
- *65. "NMR Spectroscopy of *In Vivo* Metabolism", Sandoz Research Institute, East Hanover, NJ; November 1986.
- *66. "NMR Spectroscopy of *In Vivo* Metabolism", Berlex Laboratories, Inc., Cedar Knolls, NJ; November 1986.

- *67. "NMR: Theory and Selected Applications", Annual Meeting of the American Heart Association, Dallas, TX; November 1986.
- *68. "*In Vivo* NMR Studies of Metabolism and Blood-Flow", Grand Rounds, Department of Neurology, Henry Ford Hospital, Detroit, MI; December 1986.
- *69. "Magnetic Resonance Spectroscopy with Surface Coils: Neurochemistry Moves from Test-Tube to Working Brain", Twentieth Annual Winter Conference on Brain Research, Vail, CO; January 1987.
- *70. "Application of Magnetic Resonance to the Chemistry of Living Systems, Department of Chemistry, Colorado State University, Fort Collins, CO; January 1987.
- *71. "Noninvasive Analysis of the Chemistry of Living Systems by Nuclear Magnetic Resonance Spectroscopy", St. Louis Award (St. Louis Section, Am. Chem. Soc.) address, St. Louis, MO; March 1987.
- 72. "Deuterium NMR Imaging and Blood Flow Measurements", Mallinckrodt, Inc., St. Louis, MO; April 1987.
- 73. "2-Fluoro-2-Deoxy-D-Glucose Cerebral Metabolism at Low NMR Dose (20 Mg/Kg) in the Conscious Rat *In Situ*", (presented by B.A. Berkowitz); 6th Ann. Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August, 1987.
- 74. "Monitoring the Time Course of Cerebral Deoxyglucose Metabolism by Nuclear Magnetic Resonance Spectroscopy", (presented by J.J. Kotyk); 6th Ann. Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August, 1987.
- 75. "Deuterium NMR Imaging of Cat Brain *In Situ*", (presented by R.S. Balaban); 6th Ann. Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August, 1987.
- 76. "Quantification of Tumor Blood Flow and Perfusion by Deuterium NMR *via* Two and Three Compartment Modeling of HOD (Tracer) Washout", (presented by S.-G. Kim); 6th Ann. Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August, 1987.
- *77. "Magnetic Resonance Spectroscopic Studies of Metabolism and Blood Flow", Mayo Clinic, Department of Biochemistry, Rochester, MN; September 1987.
- *78. "Multinuclear (^2H , ^{13}C , ^{19}F , ^{31}P) Magnetic Resonance Spectroscopy of Brain Physiology *In Vivo*", 19th Annual Southeast Magnetic Resonance Conference, National Institutes of Environmental Health Sciences, Research Triangle Park, NC; October 1987.
- *79. "Application of NMR to Intact Biological Systems", Am. Assoc. Cereal Chemists, Nashville, TN; November 1987.

- *80. "Metabolic Studies by NMR *In Vivo*: Cancer and Other Issues", Abbot Laboratories, Abbot, IL; November 1987.
- *81. "Metabolic Pathways and Blood Flow by NMR *In Situ*", Midwest NMR Discussion Group, Abbot Laboratories, Abbot, IL; November 1987.
- *82. "Metabolic Pathways and Blood Flow by NMR *In Situ*", Department of Biochemistry and Biophysics, University of Rochester, Rochester, NY; November 1987.
- *83. "Cerebral Deoxyglucose Metabolism *via* ^{31}P , ^{19}F , ^{13}C NMR *In Situ*", Winter Brain Conference, Steamboat, CO; February 1988.
- *84. " ^{13}C , ^{19}F and ^{31}P NMR Studies *In Situ* of Cerebral Deoxyglucose Chemistry: Is There a Conflict with Radiotracer Results", NMR88: Australian NMR Conference, Thredbo, Australia; February 1988.
- *85. "Magnetic Resonance Spectroscopy *In Vivo*: Approaches to Quantification of Metabolism and Blood Flow", Department of Biochemistry, Wright State University, Dayton, OH; March 1988.
- 86. "Magnetic Resonance Spectroscopy *In Situ*", Grand Rounds, Department of Pediatrics, Washington University School of Medicine, St. Louis, MO; March 1988.
- *87. "Quantification of Blood Flow and Tissue Perfusion *via* Deuterium NMR: The Novel Use of D_2O as a Freely Diffusible Tracer", 29th Experimental NMR Spectroscopy Conference, Rochester, NY; April 1988.
- *88. "Quantification of Carbohydrate Metabolism *In Situ via* NMR", National ACS Meeting, Toronto, Canada; June 1988.
- *89. "Metabolism and Blood Flow by NMR *In Situ*", Gordon Conference on Magnetic Resonance in Biology and Medicine, Tilton School, Tilton, NH; July 1988.
- 90. "NMR Detection of Protein Catabolism in Rat Liver *In Vivo* with a ^{19}F Containing Residualizing Label" (presented by N.N. Becker); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.
- 91. "Localization of ^{31}P NMR *In Vivo* by Combining Surface Coil and Surface Gradient" (presented by W. Chen); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.
- 92. "Glucose and Glucose Analog Induction of Tumor Acidification and Blood Flow Modulation *In Situ*: A Phosphorus and Deuterium NMR Investigation" (presented by Y. Hwang); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.

93. "Quantification of Muscle Blood Flow and Perfusion *In Situ* by Deuterium NMR" (presented by S.-G. Kim); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.
94. "Comparison of Cerebral 2-Deoxyglucose Metabolism at High and Low Levels. A ^{13}C NMR and ^{14}C Radiography Study" (presented by J. Kotyk); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.
95. "The Effect of Sepsis on Skeletal Muscle Glucose Metabolism. A ^{13}C NMR Investigation" (presented by J. Kotyk); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.
96. "The Effect of Sepsis on Red Blood Cell Metabolism and Na^+ Concentration - A ^2H , ^{31}P and ^{23}Na NMR Study" (presented by S.-K Song); 7th Ann. Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1988.
- *97. "Proton and Deuterium NMR Studies of Water in Work-Free Dough Systems" (presented by D.A. d'Avignon); Ann. Meeting A.C.S., symposium entitled "The Applications of NMR in Food and Agricultural Chemistry", Los Angeles, CA; September 1988.
- *98. "*In Vivo* Chemistry, Blood Flow and Localization via Multi-Nuclear NMR Spectroscopy", Physical Sciences Center, Monsanto, St. Louis, MO; September 1988.
- *99. "Flow Measurement, Metabolic Analysis and Volume Selection via *In Vivo* NMR", Natl. Research Council, Div. Biological Sciences, Ottawa, Canada; October 1988.
- *100. "Metabolism, Blood Flow and Volume Localization *In Vivo* via Multinuclear NMR", Smith, Kline and French Laboratories, King of Prussia, PA; October 1988.
- *101. "Non-Invasive Chemical Analysis of Living Systems via Multinuclear NMR Spectroscopy", University of South Carolina, Columbia, SC; October 1988.
- *102. "Water Binding in Dough Systems", Seymour G. Gilbert Mini-Symposium on Water Relations, Rutgers: State University of New Jersey, New Brunswick, NJ; October 1988.
- *103. "Blood Flow, Chemistry, and Localization *In Vivo* by NMR", 2nd Ann. Missouri Magnetic Resonance Symposium, University of Missouri-St. Louis, St. Louis, MO; October 1988.
104. "Localization of P-31 NMR *In Vivo* by Combining Surface Coil and Surface Coil" (presented by W. Chen); 2nd Ann. Missouri Magnetic Resonance Symposium, University of Missouri-St. Louis, St. Louis, MO; October 1988.
105. "NMR Detection of Protein Catabolism in Rat Liver *In Vivo* with a F-19 Containing Residualizing Label" (presented by N.N. Becker); 2nd Ann. Missouri Magnetic Resonance Symposium, University of Missouri-St. Louis, St. Louis, MO; October 1988.

106. "Comparison of Cerebral 2DG Metabolism at High and Low Dose Levels: A C-13 NMR and C-14 Radiography Study" (presented by J.J. Kotyk); *2nd Ann. Missouri Magnetic Resonance Symposium*, University of Missouri-St. Louis, St. Louis, MO; October 1988.
107. "Quantification of Muscle Blood Flow by H-2 NMR" (presented by S.-G. Kim); *2nd Ann. Missouri Magnetic Resonance Symposium*, University of Missouri-St. Louis, St. Louis, MO; October 1988.
108. "Tumor Acidification and Blood Flow Modulation *In Situ via* Glucose and Mannitol Administration: a P-31 and H-2 NMR Investigation" (presented by Y.C. Hwang); *2nd Ann. Missouri Magnetic Resonance Symposium*, University of Missouri-St. Louis, St. Louis, MO; October 1988.
109. "The Effect of Sepsis on Red Blood Cells - A H-2, Na-23 NMR Study" (presented by S.-K. Song); *2nd Ann. Missouri Magnetic Resonance Symposium*, University of Missouri-St. Louis, St. Louis, MO; October 1988.
- *110. "Metabolic Blood Flow and Volume Localization *via* NMR *In Vivo*", Molecular Biology and Biophysics Department, Yale University, New Haven, CT; December 1988.
- *111. "NMR Spectroscopy of Living Systems: Metabolism, Blood Flow and Volume Localization", Squibb Institute for Medical Research, Princeton, NJ; February 1989.
- *112. "Multinuclear NMR Studies of the Chemistry of Living Systems", Department of Chemistry, University of Winnipeg, Winnipeg, Canada; March 1989.
113. "NMR Spectroscopic Studies of Brain Function", Health Science Centre, Faculty of Medicine, Neurosciences Rounds, University of Manitoba, Winnipeg, Canada; March 1989.
114. "Quantification of Regional Blood Flow by Monitoring of Exogenous Tracer *via* Nuclear Magnetic Resonance Spectroscopy", Society of Magnetic Resonance in Medicine Sponsored Workshop on Magnetic Resonance Imaging of Blood Flow, Philadelphia, PA; March 1989.
115. "Inhomogeneous Surface-Spoiling Magnetic Field Gradients: The Enhancement of Surface-Coil NMR Spatial Localization" (presented by W. Chen), *30th Experimental NMR Conference*, Pacific Grove (Asilomar Conference Center), CA; April 1989.
116. "Measurement of Tumor Blood Flow by Deuterium Nuclear Magnetic Resonance Spectroscopy," Twenty-First Annual Cancer Symposium: Magnetic Resonance in Experimental and Clinical Oncology, Wayne State University School of Medicine, Detroit, MI; April 1989.
- *117. "NMR Spectroscopy *In Vivo*. The Chemistry of Intact Biological Systems", *11th Graduate Student Symposium*, Department of Chemistry, University of Rhode Island, Kingston, RI; April 1989.

- *118. "NMR Spectroscopic Studies of the Chemistry of Living Systems", Department of Chemistry, University of Notre Dame, Notre Dame, IN; May 1989.
- *119. "Nuclear Magnetic Resonance", 8th Grade Science Class Lecture, Brittany Woods Junior High School, St. Louis, MO; May 1989.
- *120. "NMR Spectroscopy for Chemical Analysis *In Vivo*", St. Louis Research Council, St. Louis, MO; June 1989.
- *121. "A Multinuclear Approach to NMR Studies of Brain Energetics", 36th Annual Meeting of the Society of Nuclear Medicine, St. Louis, MO; June 1989.
- *122. "Strategies for Enhanced Spatial Localization *via* Inhomogeneous Surface-Spoiling Magnetic Field Gradients", Topical Workshop on Localized NMR Spectroscopy *In Vivo*: Problems, Strategies, and Applications, Max-Planck-Institute für biophysikalische Chemie, Göttingen, FRG; June 1989.
- *123. "Strategies Toward NMR of Intact Biological Systems", St. Louis Section, American Chemical Society NMR Topical Group, St. Louis, MO; June 1989.
- *124. "Cerebral Deoxyglucose Metabolism: ¹³C, ¹⁸F and ³¹P Surface-Coil NMR Spectroscopy of Rat Brain *In Vivo*", J.J.H. Ackerman, 8th Annual Meeting of the Society of Magnetic Resonance in Medicine, Amsterdam, the Netherlands; August 1989.
- 125. "Natural-Abundance ¹³C NMR Surface-Spoiling Localization of Rat Liver *In Vivo*", (presented by W. Chen), 8th Annual Meeting of the Society of Magnetic Resonance in Medicine, Amsterdam, the Netherlands; August 1989.
- 126. "*In Vivo* ¹³C{¹H} NMR Spectroscopic Monitoring Reveals Formation of Brain [1-¹³C]2DG Glycogen in Anesthetized Rats", (presented by R.K. Deuel), Annual Meeting Society of Neuroscience, Phoenix, AZ; October 1989.
- 127. "Characterization of Hepatic Metabolism of Cholesterol Ester-Rich VLDL Non-invasively by NMR Spectroscopy", (presented by A. Daugherty), 62nd Annual Meeting of the American Heart Association, New Orleans, LA; November 1989.
- *128. "Antisense Coils, Surface Magnetic Field Gradients, and the Question of Tumor pH: Approaches to *In Vivo* NMR Experimentation", Department of Biological Sciences, Carnegie Mellon University, Pittsburgh, PA; January 1990.
- 129. "*De Novo* Assessment of Absolute Metabolite Concentration *via* ²H/³¹P NMR *In Vivo*: An Accurate, Robust Method to Account for Sample Electrical Coupling", (presented by S.-K. Song), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.
- 130. "Validation of the Deuterium NMR Washout Method for Measuring Organ Perfusion", (presented by J.J. Neil), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.

131. "Murine RIF-1 Tumor Acidification *via* 3-O-Methyl-D-glucose (A *Metabolically Inert Glucose Analog!*): A $^{13}\text{C}/^1\text{H}$ NMR Study", (presented by Y.C. Hwang), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.
132. "Concurrent *In Vivo* $^2\text{H}/^{31}\text{P}$ NMR Determination of Alteration of Metabolism and Blood Flow in Rat Leg Muscle during Sepsis", (presented by R.S. Hotchkiss), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.
133. "Physiologic Correlation Studies in RIF-1 Tumors by *In Vivo* and High Resolution NMR Spectroscopy", (presented by T. Bezabeh), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.
134. "Intracellular Degradation of Lipoproteins Determined in Intact Tissue by NMR Spectroscopy Using a ^{19}F Residualizing Label", (presented by L.A. Scherrer), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.
135. "Analysis of Surface-Spoiling Gradient NMR Localization Employing a Surface-Coil NMR Probe", (presented by W. Chen), 9th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1990.
- *136. "Monitoring Chemistry in Living Systems: NMR Spectroscopy", Department of Chemistry, Eastern Illinois University, Charleston, IL; October 1990.
- *137. "Multinuclear Magnetic Resonance Studies of Cerebral Deoxyglucose Metabolism", Physical Techniques to Image Metabolism: a joint symposium of the Division of Chemical Physics and the Division of Biological Physics, Meeting of the American Physical Society, Cincinnati, OH; March 1991.
- *138. "Modulation of Tumor Biology *via* Glucose and its Analogs Mannitol and 3-O-Methylglucose: A ^1H , ^{13}C , and ^{31}P NMR Study", Annual Meeting of the American Society for Biochemistry and Molecular Biology, Atlanta, GA; April 1991.
- *139. "Basic Principles", Tutorial on *In Vivo* Magnetic Resonance Spectroscopy -- *In Vivo* Magnetic Resonance Spectroscopy IV, St. Louis; April 1991.
140. "Comparison of Fourier and Bayesian Analysis of NMR Signals. The Signal Frequency Case", (presented by G.L. Bretthorst), 32nd Annual Meeting of the Experimental NMR Conference, St. Louis, MO; April 1991.
- *141. "Biochemistry *in Situ*: NMR Studies of Living Systems", Florida State University, Tallahassee, FL; May 1991.
- *142. "Biochemistry *in Situ*: NMR Studies of Living Systems", Robert Wood Johnson Pharmaceutical Research Institute, Spring House, PA; May 1991.

- *143. "A Multinuclear NMR Approach to the Chemistry of Living Systems", *Xth* International Meeting on NMR Spectroscopy by the Royal Society of Chemistry, St. Andrews, Scotland; July 1991.
- 144. "Tumor Intracellular pH Measurements with 2-Deoxyglucose-6-Phosphate", (presented by Z. Zhu), *10th* Annual Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1991.
- 145. "Magnetization Transfer: An Alternative for Dissociation Constant Determination of Ca-¹⁹F-BAPTA", (presented by S.-K. Song), *10th* Annual Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1991.
- 146. "Adaptation of the Isolated Perfused Rat Hind Limb Preparation for the NMR Study of Muscle Metabolism", (presented by S.-K. Song), *10th* Annual Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1991.
- 147. "Development of an 'In-Magnet' Tumor Hyperthermia/NMR Probe", (presented by T. Bezabeh), *10th* Annual Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1991.
- 148. "An Approach to Solving the Dynamic Range Problem in Measurement of the Pseudodiffusion Coefficient with Spin Echoes", (presented by J.J. Neil), *10th* Annual Meeting of the Society of Magnetic Resonance in Medicine, San Francisco, CA; August 1991.
- *149. "Deuterium Magnetic Resonance Imaging", Applications of Stable Isotopes in Magnetic Resonance Imaging: a symposium at the meeting of the International Isotope Society, Toronto, Canada; September 1991.
- *150. "*In Vivo* Deuterium NMR", International Conference on NMR Microscopy, Heidelberg, Germany; September 1991.
- *151. "Approaches to Chemistry and Physiologic Function in Living Systems *via* NMR Spectroscopy and Imaging", Teaching Session of the International Conference on NMR Microscopy, Heidelberg, Germany; September 1991.
- *152. "Simple (?) Experiments with Expensive Equipment: Surface Spoiling Gradients, Antisense Coaxial Coils, and Water Suppressed (!) Blood Flow Measurements", Symposium of the Dutch National *in Vivo* NMR Facility, Bijvoet Center for Biomolecular Research, University of Utrecht, Utrecht, the Netherlands; September 1991.
- *153. "NMR Spectroscopy *in Vivo*: Monitoring the Chemistry and Physiology of Intact Biological Systems", Sandoz Research Institute, Sandoz Pharmaceuticals Corp., East Hanover, New Jersey; September 1991.
- *154. "NMR *in Vivo*. The Chemistry and Physiology of Living Systems", Department of Chemistry, Grinnell College, Grinnell, IA; October 1991.

- *155. "Two NMR Approaches for Measuring Blood Flow *in Vivo*: D₂O as a Freely Diffusible Tracer and the Water Suppressed Pulsed Field Gradient Experiment", Department of Chemistry, University of Illinois, Champaign-Urbana, IL; October 1991.
- *156. "Probability Theory and NMR", (presented by G. Larry Bretthorst), 33rd Experimental NMR Conference, Asilomar, California; March, 1992.
- *157. "Novel Magnetic Resonance Approaches to Metabolism and Physiology *in Vivo*", the Royal College of Surgeons of England, London, England; May 1992.
- 158. "The Use of Slice-selective Inversion to Improve the Dynamic Range for Measurement of Pseudodiffusion Coefficient", (presented by J.J. Neil), 11th Annual Meeting of the Society of Magnetic Resonance in Medicine, Berlin, Germany; August 1992.
- 159. "Detection of Pseudodiffusion in Rat Brain Following Blood Substitution with Perfluorocarbon", (presented by J.J. Neil), 11th Annual Meeting of the Society of Magnetic Resonance in Medicine, Berlin, Germany; August 1992.
- 160. "Assessment of Murine Tumor pH and Phosphorus Metabolite Response During Hyperthermia: An *In Vivo* ³¹P NMR Study", (presented by T. Bezabeth) 11th Annual Meeting of the Society of Magnetic Resonance in Medicine, Berlin, Germany; August 1992.
- 161. "Evaluation of the Effect of Sepsis on Tricarboxylic Acid Cycle Flux and Glucose Metabolism in Skeletal Muscle Using ¹³C NMR Spectroscopy", (presented by X. Yang) 11th Annual Meeting of the Society of Magnetic Resonance in Medicine, Berlin, Germany; August 1992.
- *162. "New Approaches to Magnetic Resonance *in Vivo*", XV International Conference on Magnetic Resonance in Biological Systems", Jerusalem, Israel; August 1992.
- *163. "Monitoring and Modulating Tumor Physiologic Status (pH, Blood Flow, ATP) Concurrent with Hyperthermia: An NMR Approach Using the Murine RIF-1 System", Mallinckrodt Institute of Radiology, Section of Cancer Biology, Radiation Oncology Center, Washington University, St. Louis, MO; October 1992.
- *164. "The Intravoxel Incoherent Motion (IVIM) Method for Detection of Blood Movement", (presented by J.J. Neil) Functional MRI of the Brain Workshop, Arlington, VA; June 1993.
- 165. "Evaluation of the Effect of Sepsis on Tricarboxylic Acid Cycle Flux and Glucose Metabolism in Rat Heart by ¹³C NMR Spectroscopy", (presented by Xiaoqing Yang) 12th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1993.

166. "Increased Intracellular Ca^{2+} : A Critical Link in the Pathophysiology of Sepsis?", (presented by Victor Song) 12th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1993.
167. "*In Vivo* ^{31}P NMR Spectroscopic Studies of the Effects of i.p. Glucose Injections on RIF-1 pH: Influence of Anesthesia and Tumor Implantation Site", (presented by Jeffrey Evelhoch) 12th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1993.
168. "Measurement of the NMR Visibility of ^{133}Cs in BSA Protein Gels and Perfused Hearts", (presented by Paul Schornack) 12th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1993.
169. "Observation of ^{133}Cs in *in vivo*: A Preliminary Study", (presented by Yi Li) 12th Annual Meeting of the Society of Magnetic Resonance in Medicine, New York, NY; August 1993.
- *170. "Novel Engineering Approaches to Biomedical Magnetic Resonance", Biomedical Engineering Society, 1993 Annual Fall Meeting, Memphis, TN; October 1993.
- *171. "Novel Magnetic Resonance Approaches to Biological Systems: Bayesian Probability Theory, Fast Field Switched ESR and Pseudodiffusion", Albert Einstein College of Medicine of Yeshiva University, Bronx, NY; February, 10, 1994.
- *172. " ^{13}C MR Monitoring of Evolving and Steady State Metabolism: Applications to Brain, Heart and Tumors", Advanced Clinical MRI/MRS and ^{13}C MR Spectroscopy Symposium, The University of Texas Southwestern Medical Center, Dallas, TX; March 10, 1994.
- *173. "Novel Magnetic Resonance Approaches to Biological Systems: Bayesian Probability Theory, Fast Field Switched ESR and Pseudodiffusion", School of Biological Sciences, Division of Cell Biology and Biophysics, University of Missouri at Kansas City, Kansas City, MO; March 31, 1994.
- *174. "Lost in the Land of (Biomedical)-Oz: A Physical Chemist's Search for the Way Out. Personal Recollections C Some of Which are True", *In Vivo* Magnetic Resonance Spectroscopy Symposium, Monterey, CA; April 9, 1994.
- *175. "The ^{31}P NMR pH Measurement Revisited: Does P_i Reflect Tumor *Intracellular* pH?", 77th Canadian Society for Chemistry Conference and Exhibition", Winnipeg, Canada; May 29-June 2 1994.
- *176. "Novel Approaches to Magnetic Resonance *in vivo*: Bayesian probability analysis, fast field switching, and pseudodiffusion" at the University of Alberta, Edmonton, Alberta, Canada, July 20, 1994.

- *177. "Non-Traditional Approaches with Magnetic Resonance *In Vivo*", XVIth International Conference on Magnetic Resonance in Biological Systems, Veldhoven, the Netherlands; August 14-19, 1994.
- *178. "William D. Phillips: A Memorial", XVIth International Conference on Magnetic Resonance in Biological Systems, Veldhoven, the Netherlands; August 14-19, 1994.
- 179. "Tumor ³¹P NMR pH Measurements: A Comparison of Inorganic Phosphate and *Intracellular* 2-Deoxyglucose-6-Phosphate as pH Indicators *in vivo*", (presented by Jeffrey Evelhoch), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 180. "A General Analysis of the Error in NMR pH Measurements", (presented by Jeffrey Evelhoch), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 181. "Characterization of ¹³³Cs as an Intracellular Probe *in Vivo*", (presented by Yi Li), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 182. "An Evaluation of the Sensitivity of the IVIM Method of Blood Flow Detection to Changes in Cerebral Blood Flow", (presented by Jeffrey Neil), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 183. "Evaluation of Blood Flow 'Coherence' in Rat Brain *via* ¹⁹F NMR Following Blood Substitution with Perfluorocarbon", (presented by Jeffrey Neil), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 184. "Na⁺-K⁺ ATPase Pump Activity is Depressed in Septic Shock: A ¹³³Cs MRS Study", (presented by Paul Schornack), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 185. "Is ⁸⁷Rb⁺ a Better Analog of K⁺ than ¹³³Cs⁺", (presented by Paul Schornack), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- 186. "*In Vivo* Determination of [Ca²⁺]_i using ¹⁹F NMR" (presented by S.-K. Song), at the 2nd Society of Magnetic Resonance Meeting and Exhibition, San Francisco, CA; August 6-12, 1994.
- *187. "Magnetic Resonance Approaches to Biophysics in Living Systems", Molecular Biophysical Program, Washington University, St. Louis, MO; September 12, 1994.
- *188. "Noninvasive Bioanalysis: Bayesian Probability Theory (Applied to Metabolite Quantification) and Pseudodiffusion (Is it Real?)", 21st annual conference of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), St. Louis, MO; October 2-7, 1994.

- *189. "Indirect Monitoring of Intracellular Ca^{2+} Concentration and K^+ Transport with Intact Biological Systems *via* ^{19}F , ^{87}Rb , and ^{133}Cs NMR", Workshop on Advances in Physiological Chemistry by *In Vivo* NMR, Woods Hole, MA, March 22-24, 1995.
- 190. "Evaluation of Intracellular Diffusion in Rat Brain via Cesium-133 NMR", (presented by Jeffrey Neil) at the Symposium on In Vivo Magnetic Resonance Spectroscopy VIII, North Falmouth, MA, March 25-26, 1995.
- *191. "Unusual Approaches to Magnetic Resonance: A Spectrometer Without RF Transmitter, Exponential Analysis Without Least-Squares, Intracellular Diffusion Without $^1\text{H}_2\text{O}$ NMR", Massachusetts General Hospital, Charlestown, MA; June 16, 1995.
- 192. "Evaluation of Intracellular Diffusion in Rat Brain via Cesium-133 NMR", (presented by Jeffrey Neil) at the Annual Meeting of the Society of Magnetic Resonance, Nice, France; August 1995.
- *193. "Magnetic Resonance of Living Organisms: Probing Complex Systems", Keynote Speaker at the Howard Hughes Symposium, hosted by the Department of Biology, Washington University, St. Louis, MO; September 9, 1995.
- *194. "The NMR pH Measurement Revisited: The Question of Tumor pH", Institute of Biodiagnostics, National Research Council of Canada, Winnipeg, Manitoba, September 28, 1995.
- *195. "Three Unusual Approaches to Magnetic Resonance in Living Systems", Betts Symposium, Winnipeg, Manitoba, September 28, 1995.
- *196. " K^+ Transport and Ca^{2+} Regulation in Intact Biological Systems Monitored by ^{133}Cs and ^{19}F NMR", Betts Symposium, Winnipeg, Manitoba, September 29, 1995.
- 197. "Transient Magnetic Resonance without RF Pulses: Fast Field Switching", 37th ENC Conference, Pacific Grove, CA, March 17-22, 1996.
- 198. "Magnetic Resonance Imaging Using Probability as Logic", (presented by Chung-Yi Hong), 37th Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA, March 17-22, 1996.
- 199. "A Comparison of $^{87}\text{Rb}^+$ and $^{133}\text{Cs}^+$ Transport in Perfused Rat Heart", (presented by Paul A. Schornack) at the Society of Magnetic Resonance 4th Scientific Meeting and Exhibition, New York, NY, April 27-May 3, 1996.
- 200. "Magnetic Resonance Imaging Using Probability Theory as Logic", (presented by Chung-Yi Hong) at the Society of Magnetic Resonance 4th Scientific Meeting and Exhibition, New York, NY, April 27-May 3, 1996.
- *201. "Simple NMR Experiments on Complex Systems", 38th Rocky Mountain Conference on Analytical Chemistry, Denver, CO, July 21-26, 1996.

202. "³¹P NMR Studies of RIF-1 Tumor Metabolism During Localized Hyperthermia with an In-Magnet Hyperthermia/NMR Probe", (presented by Bill Spees) at the International Society for Magnetic Resonance in Medicine Workshop on MR of Cancer: Physiology and Metabolism, Baltimore, MD, August 8-9, 1996.
- *203. "Intra- and Extracellular Compartmental Resolution by NMR: Ions in Complex Living Systems", XVII ICMRBS, Keystone, CO, August 18-23, 1996.
204. "Magnetic Resonance Imaging Using Probability Theory as Logic", (presented by Chung-Yi Hong) at the 38th Experimental Nuclear Magnetic Conference (ENC), Orlando, FL, March 23-27, 1997.
205. "Cerebral Sodium Accumulation in Transient Focal Ischemia in Rat: A ²³Na MRI Study", (presented by Timothy Q. Duong) at the 5th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM) in Vancouver, British Columbia, April 12-18, 1997.
206. "Characterization of Normal Myocardial Function in the Mouse with MR Tagging at 4.7 Tesla", (presented by Robert E. Henson) at the 5th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM) in Vancouver, British Columbia, April 12-18, 1997.
207. "Diffusion Tensor Imaging of the Lithium/Pilocarpine Model of Status Epilepticus", (presented by James S. Park) at the 5th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM) in Vancouver, British Columbia, April 12-18, 1997.
208. "Maintenance of Sodium Homeostasis in Perfused Rat Muscle During Sepsis", (presented by Sheng-Kwei Song) at the 5th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM) in Vancouver, British Columbia, April 12-18, 1997.
- *209. "(Simple ?) Magnetic Resonance Approaches to Compartmental Resolution", Brookhaven National Laboratory, Long Island, NY, May 21, 1997.
- *210. "Magnetic Resonance Biological Approches to Compartmental Resolution", Northwestern University, Evanston, IL, October 6, 1997.
- *211. "Magnetic Resonance Biological Approches to Compartmental Resolution", Washington University Medical School, Biomedical Engineering in Cardiology Seminar, St. Louis, MO, October 27, 1997.
- *212. "Magnetic Resonance Biological Approches to Compartmental Resolution", ACS Regional Meeting, Lake of the Ozarks, MO, October 31, 1997.
- *213. "Biophysics of Water Displacement in the CNS: Towards an Understanding of the Decrease in Magnetic Resonance Apparent Diffusion Constant (ADC) in Cell Injury", University of Pennsylvania, Philadelphia, PA, February 12, 1998.

- *214. "Central Nervous System Cell Injury and Water Motion: The Biophysics of the Magnetic Resonance Apparent Diffusion Constant Visualization of Stroke", University of Arizona, Tucson, AZ, February 20, 1998.
- *215. "Evaluation of Extra- and Intracellular Diffusion in Normal and Globally-Ischemic Rat Brain *via* ^{19}F NMR", (presented by Timothy Q. Duong), 6th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Sydney, Australia, April 18-24, 1998.
- *216. "Extracellular and Intracellular Apparent Diffusion in Normal and Focally-Ischemic Rat Brain *via* ^1H MRS", (presented by Timothy Q. Duong), 6th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Sydney, Australia, April 18-24, 1998.
- *217. "Evaluation of Compartment-Specific Motion in Normal and Globally-Ischemic Rat Brain *via* ^1H MRS", (poster presented by Timothy Q. Duong), 6th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Sydney, Australia, April 18-24, 1998.
- *218. "Evaluation of Equilibrium Transcytolemmal Water Exchange in Intact Rat Brain", (presented by Jeffrey J. Neil), 6th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Sydney, Australia, April 18-24, 1998.
- *219. "Physiologic Manipulation of RIF-1 Tumor Enhances Sensitivity to Localized Hyperthermia *In Vivo*: A ^{31}P NMR Study", (presented by William Spees), 6th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Sydney, Australia, April 18-24, 1998.
- *220. "Spatial Interference Effects in Volume Localized Spectroscopy of J-Coupled Nuclei", (poster presented by Dmitriy Yablonskiy), 6th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Sydney, Australia, April 18-24, 1998.
- 221. "Defining the pH_i -Hyperthermia Sensitivity Relationship for the RIF-1 Tumor *In Vivo*: A ^{31}P Study", (presented by William Spees), 2nd Biannual Workshop of the ISMRM Cancer Study Group "Magnetic Resonance in Experimental and Clinical Cancer Research", St. Louis, November 13-15, 1998.
- *222. "Focus Group on MRS in Clinical Oncology", Workshop Coordinator and Chair, National Cancer Institute, National Institutes of Health, Bethesda, MD, April 22-23, 1999.
- *223. "Visualizing Tissue Damage: Magnetic Resonance Imaging of Cell Injury", Department of Anesthesia Grand Rounds, Washington University Medical School, May 12, 1999.
- 224. "Intracellular Acidification Increases Thermal Sensitivity for the RIF-1 Tumor *In Vivo*", (presented by William Spees), 7th Scientific Meeting and Exhibition for the International

- Society for Magnetic Resonance in Medicine (ISMRM), Philadelphia, PA, May 22-28, 1999.
225. "Longitudinal Sodium MRI Study of Focal Cerebral Ischemia", (poster presented by Shao-Pow Lin), 7th Scientific Meeting and Exhibition for the International Society for Magnetic Resonance in Medicine (ISMRM), Philadelphia, PA, May 22-28, 1999.
226. "SrPRESSed Technique for Lactate Editing in Localized Volume Spectroscopy", (poster presented by Dmitriy Yablonskiy), 7th Scientific Meeting and Exhibition for the International Society for Magnetic Resonance in Medicine (ISMRM), Philadelphia, PA, May 22-28, 1999.
227. "The Structure of BOLD Signal in Functional MRI: Linear and Nonlinear Contribution", (poster presented by Dmitriy Yablonskiy), 7th Scientific Meeting and Exhibition for the International Society for Magnetic Resonance in Medicine (ISMRM), Philadelphia, PA, May 22-28, 1999.
228. "Exponential Sampling, and Markov Chain Monte Carlo Model Selection Applied to NMR", (presented by G. Larry Bretthorst), 19th International Conference on Maximum Entropy and Bayesian Methods, Bosie, ID, August 1-6, 1999.
229. "Utilizing Magnetic Resonance and Probability Theory to Determine the Rate of Water Exchange in Rat Brains in vivo", (presented by James D. Quirk), 19th International Conference on Maximum Entropy and Bayesian Methods, Bosie, ID, August 1-6, 1999.
230. "High Resolution Sodium Magnetic Resonance Imaging of Focal Cerebral Ischemia in Rats", (poster presented by Shao-Pow Lin), High Resolution Imaging in Small Animals With PET, MR And Other Modalities Meeting, Amsterdam, the Netherlands, September 27-29, 1999.
- *231. "MR Studies of Cell Injury: The apparent diffusion constant", the Forty Years of Experimental NMR (Gary Maciel) Symposium, Fort Collins, CO, January 8-9, 2000.
232. "²³Na MRI for the Detection of Dead Tissue Following Temporary Focal Cerebral Ischemia", (poster presentation by S-P. Lin), 8th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Denver, CO, April 1-7, 2000.
233. "Correlated Changes in MR Signal Intensity and Frequency Suggest Correlated Changes in Brain Temperature and Metabolism During Functional Activation", (poster presentation by D.A. Yablonskiy), 8th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Denver, CO, April 1-7, 2000.
234. "*In Vivo* Neuronal Fiber Tract Mapping in Mouse Using Diffusion Tensor Imaging: Detection of Central Nervous System Phenotypes in Twitcher Mice", (poster

- presentation by S-K. Song), 8th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Denver, CO, April 1-7, 2000.
235. "Human Blood Exhibits Gaussian Relaxation Behavior", (poster presentation by W.M. Spees), 8th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Denver, CO, April 1-7, 2000.
236. "Diffusion Weighted MR Imaging Improves Prostate Tumor Detection in Transgenic Mice: A Comparison of T₂ and Apparent Diffusion Coefficients in Normal Prostate and Tumor", (poster presentation by S-K. Song), 8th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine (ISMRM), Denver, CO, April 1-7, 2000.
- *237. "Easy Questions but Hard Answers: Is Intracellular-Extracellular Water Exchange in Brain Fast or Slow", CRMBM-CNRS, Marseille, France, October 18, 2000.
238. "Magnetic Resonance and Positron Emission Imaging of Cancer in Small Laboratory Animals at Washington University", Developmental Therapeutics Retreat, Washington University School of Medicine Cancer Center, St. Louis, MO, December 12, 2000.
239. "Albumin-binding MR Blood Pool Agent Contrast Enhancement in Mouse Glioma", (presentation by Kofi Adzali), International Society for Magnetic Resonance in Medicine ISMRM-ESMRMB Joint Annual Meeting, Glasgow, Scotland, April 21-27, 2001.
240. "Measurement of Transmembrane Water Exchange Rate for the in situ Rat Brain", (presentation by James D. Quirk), International Society for Magnetic Resonance in Medicine ISMRM-ESMRMB Joint Annual Meeting, Glasgow, Scotland, April 21-27, 2001.
241. "Water and Lipid MR Imaging of the Xenopus oocyte", (poster presentation by Jonathan V. Sehy), International Society for Magnetic Resonance in Medicine ISMRM-ESMRMB Joint Annual Meeting, Glasgow, Scotland, April 21-27, 2001.
242. "A Comparison of ⁸⁷Rb⁺ and ¹³³Cs⁺ Transport in Perfused Rat Heart", (poster presentation by Paul A. Schornack), International Society for Magnetic Resonance in Medicine ISMRM-ESMRMB Joint Annual Meeting, Glasgow, Scotland, April 21-27, 2001.
243. "Magnetic Susceptibility of Human Blood", (poster presentation by Dmitriy Yablonskiy), International Society for Magnetic Resonance in Medicine ISMRM-ESMRMB Joint Annual Meeting, Glasgow, Scotland, April 21-27, 2001.
244. "MR Measurement of the Apparent Diffusional Water Permeability of the Xenopus Oocyte Plasma Membrane", (poster presentation by Jonathan), International Society for Magnetic Resonance in Medicine ISMRM-ESMRMB Joint Annual Meeting, Glasgow, Scotland, April 21-27, 2001.

- *245. "Water: The "Ultimate" BioMolecule -- Or Why MRI Works and is Interesting", Biophysical Evenings, Washington University, St. Louis, MO, March 19, 2002.
- *246. "The Exponential Modeling Problem: A Bayesian Solution", Varian Users' Conference 2002, Palo Alto, CA, April 12-13, 2002.
- *247. "Compartment Exchange Kinetics in Situ: How Long Does Water Remain Inside (or Outside) Cells in Mammalian Brain?", 43rd Experimental Nuclear Magnetic Conference (ENC), Pacific Grove, CA, April 14-19, 2002.
- 248. "Evidence that both "Fast" and "Slow" Water ADC Components Arise from the Intracellular Space", (presented by Jonathan Sehy), International Society for Magnetic Resonance in Medicine (ISMRM) 10th Scientific Meeting, Honolulu, HI, May 18-24, 2002.
- 249. "MR Measurement of Tetramethyl Ammonium Ion ADC in Rat Brain", (presented by Christopher Kronke), International Society for Magnetic Resonance in Medicine (ISMRM) 10th Scientific Meeting, Honolulu, HI, May 18-24, 2002.
- 250. "Intracellular Water ADC Decrease Following a Reduction in Cell ATP Levels", (poster presented by Jonathan Sehy), International Society for Magnetic Resonance in Medicine (ISMRM) 10th Scientific Meeting, Honolulu, HI, May 18-24, 2002.
- 251. "The Apparent Diffusion of Water, Ions, and Small Molecules in the *Xenopus* Oocyte is consistent with Brownian Displacement", (poster presented by Jonathan Sehy), International Society for Magnetic Resonance in Medicine (ISMRM) 10th Scientific Meeting, Honolulu, HI, May 18-24, 2002.
- 252. "On the Role of Blood Flow in Brain Temperature Regulation", (poster presented by Dmitriy A. Yablonskiy), International Society for Magnetic Resonance in Medicine (ISMRM) 10th Scientific Meeting, Honolulu, HI, May 18-24, 2002.
- 253. "MRI Characterization of Lung Lesions in a Mouse Model of Idiopathic Pulmonary Fibrosis", (poster presented by Joel Garbow), In Vivo Magnetic Resonance Gordon Conference, New London, NH, July 28-August 2, 2002.
- 254. "MR Measurement of Tetramethyl Ammonium Ion ADC in Rat Brain", (poster presented by Christopher Kronke), In Vivo Magnetic Resonance Gordon Conference, New London, NH, July 28-August 2, 2002.
- 255. "What to Do With the ¹H Resonance of Water in Vivo: Modeling an Ill-defined Large Amplitude Nuisance Resonance", In Vivo Magnetic Resonance Gordon Conference, New London, NH, July 28-August 2, 2002.
- *256. "¹H MR Discrimination of Intra- and Extracellular Compartments", Magnetic Resonance in Biological Systems Conference (ICMRB8), Toronto, Canada, August 25-30, 2002.

257. "Combining PET and MRI at the Washington University Small Animal Imaging Program", Small Animal Imaging Resource Program Centers and Mouse Models of Human Cancers Consortium (MMHCC) Imaging Working Group Meetings, Philadelphia, PA, July 8 & 9, 2003.
258. "Theory of $^1\text{H}_2\text{O}$ T_2 Relaxation in Blood" (poster presented by Dmitriy Yablonskiy), International Society for Magnetic Resonance in Medicine (ISMRM) 11th Scientific Meeting and Exhibition, Toronto, Canada, July 10-16, 2003.
259. "Bulk Sodium Diffusion in Rat Brain" (poster presented by James Goodman), International Society for Magnetic Resonance in Medicine (ISMRM) 11th Scientific Meeting and Exhibition, Toronto, Canada, July 10-16, 2003.
260. "Theory of Bi-Exponential Diffusion Attenuation in a Single Homogeneous Cell" (oral presentation by Alex Sukstanskii), International Society for Magnetic Resonance in Medicine (ISMRM) 11th Scientific Meeting and Exhibition, Toronto, Canada, July 10-16, 2003.
261. "Effect of Acute ATP Depletion on the Intracellular Water ADC of *Xenopus* Oocyte" (oral presentation by Lin Zhao), International Society for Magnetic Resonance in Medicine (ISMRM) 11th Scientific Meeting and Exhibition, Toronto, Canada, July 10-16, 2003.
262. "Bayesian Probability Theory Applied to MR Data Analysis", at the Workshop on Dynamic Spectroscopy and Measurements of Physiology, Metabolism and Function, Orlando, FL, September 6-8, 2003.
263. "*In-vivo* Measurement of Liver Lipid Levels in Mice" (presented by Joel Garbow), at the Workshop on Dynamic Spectroscopy and Measurements of Physiology, Metabolism and Function, Orlando, FL, September 6-8, 2003.
264. "Statistical Approach in the Theory of Diffusion Attenuated MR Signals in Biological Systems" (oral presentation by Dmitriy Yablonskiy), 7th International Conference on Magnetic Resonance Microscopy (7th "Heidelberg" Conference) September 21-26, 2003 Snowbird Ski and Summer Resort, Snowbird, Utah.
- *265. "The NMR "Diffusion Signal." A Road Map to SubVoxel MicroStructure or Quicksand for Model Builders?", 2003 Minnesota Workshop on High Field MR Imaging and Spectroscopy and Magnetic Resonance Imaging of Brain Function", Minneapolis, MN, October 17-20, 2003.
- *266. "Probing Macroscopic Objects at the Micron Scale by Diffusion Sensitive Magnetic Resonance", NMR Symposium and Dedication of the NMR Facility of West Virginia University, Morgantown, WV, October 30, 2003.
267. "Physical Mechanisms Behind Diffusion Attenuated MR Signal Attenuation in Biological Tissues" (oral presentation by Dmitriy A. Yablonskiy), 45th Experimental NMR Conference, Asilomar Conference Center, Pacific Grove, CA, April 18-23, 2004.

268. "Intracellular-Water Specific MR of Cultured HeLa Cells" (oral presentation by Lin Zhao), 12th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Kyoto, Japan, May 15-21, 2004.
269. "On the Nature of NAA Diffusion and the Apparent Viscosity Inside Neurons of the Central Nervous System" (poster presentation by Chris Kroenke), 12th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Kyoto, Japan, May 15-21, 2004.
270. "The Influence of Membrane Permeability on Bi-Exponential Behavior of Diffusion-Attenuated MR Signal from a Single-Cell" (oral presentation by Alex Suskstanskii), 12th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Kyoto, Japan, May 15-21, 2004.
271. "Statistical Approach in Diffusion MRI" (oral presentation by Dmitriy A. Yablonskiy), 23rd International Congress of Radiology – ICR, Montreal, Canada, June 25-29, 2004.
272. "Theoretical Model of Brain Temperature Distribution and Changes During Functional Activation" (oral presentation by Dmitriy A. Yablonskiy), SIAM Annual Meeting, Oregon Convention Center, Portland, OR, July 12-16, 2004
- *273. "Diffusion of Intra- and Extracellular Water in Tissue", *In Vivo* Magnetic Resonance Gordon Conference, Bates College, Lewiston, Maine, July 25-30, 2004.
- *274. "Water Diffusion in Living Systems Quantified by Magnetic Resonance: Remarkable Findings, Easy Questions, Hard Answers", University of Missouri at St. Louis, Saint Louis, Missouri, September 20, 2004.
275. "On the Role of Anesthesia on the Body/Brain Temperature Differential in Rats" (oral presentation by Dmitriy A. Yablonskiy), The 1st Symposium on Physiology and Pharmacology of Temperature Regulation (PPTR), Hilton Rhodes, Greece, October 10-15, 2004.
- *276. "Water, Water Everywhere: The Problem of Compartmental Resolution of the Water MR Signal in Living Systems", Symposium in Honor of the 70th Birthday of Professor Chien Ho, Carnegie-Mellon University, Pittsburgh, PA, November 13, 2004.
277. "Intracellular Water Specific MR of Cultured HeLa Cells" (poster presentation by Lin Zhao), 46th Experimental NMR Conference, Providence Convention Center, Providence, RI, April 14-15, 2005.
278. "Imaging Trajectories in Very Low Field MRI" (poster presentation by Alex Sukstanskii), 46th Experimental NMR Conference, Providence Convention Center, Providence, RI, April 14-15, 2005.
279. "Image Artifacts in Very Low Magnetic Field MRI: the Role of Concomitant Gradients" (poster presentation by Alex Sukstanskii), 13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami Beach Convention Center, Miami Beach, May 7-13, 2005.

280. "In Vivo Detection and Localization of Prostate Carcinoma Using DTI" (poster presentation by Junqian Gordon Xu), 13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami Beach Convention Center, Miami Beach, May 7-13, 2005.
281. "Intracellular Water Diffusion of Cultured HeLa Cells" (oral presentation given by Lin Zhao), 13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami Beach Convention Center, Miami Beach, May 7-13, 2005.
282. "MR Spectroscopic Measurement of Inhomogeneous Temperature in Rat Brain" (oral presentation given by Mingming Zhu), 13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami Beach Convention Center, Miami Beach, May 7-13, 2005.
283. "Sodium Diffusion in Healthy and Ischemic Rat Brain" (oral presentation given by James Goodman), 13th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Miami Beach Convention Center, Miami Beach, May 7-13, 2005.
- *284. "Progress (?) toward Quantitative Interpretation of the MR Diffusion Signal", 2005 Minnesota Workshop on High Field MR Imaging and Spectroscopy and Magnetic Resonance Imaging of Brain Function", Minneapolis, MN, October 13–16, 2005.
285. "Magnetic Resonance Imaging and the Diffusion of Water – Physical Chemistry and Biophysics Meet Radiology", Rhodes College, Memphis TN, November 7, 2005.
- *286. "Ultra High Field MR *in Vivo*: Adventures on a Varian/Magnex 12 Tesla Scanner", Varian, Inc. Symposium - Pushing the Envelope with High Fields, 14th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Seattle, WA, May 6-12, 2006.
- *287. "Can Diffusion MR Measure Anything? Yes, but *Caveat Emptor!*", Diffusion and Perfusion MR Study Group Symposium, 14th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Seattle, WA, May 6-12, 2006.
288. "Effect of Blood Flow on Brain Temperature Distribution" (poster presentation given by Mingming Zhu), 14th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Seattle, WA, May 6-12, 2006.
289. "The Intracellular Water Diffusion Coefficient of Cultured Microbead-Adherent HeLa Cells is $\geq 1 \mu\text{m}^2/\text{ms}$ " (poster presentation given by Lin Zhao), 14th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Seattle, WA, May 6-12, 2006.
290. "Subcompartmental Cesium Diffusion in Healthy and Globally Ischemic Rat Brain" (poster presentation given by James Goodman), 14th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Seattle, WA, May 6-12, 2006.
291. "A Theoretical Model of Water Diffusion in Brain Tissue" (electronic poster discussion given by Sune Nørhøj Jespersen), 14th Scientific Meeting of the International Society for

Magnetic Resonance in Medicine, Seattle, WA, May 6-12, 2006.

- *292. "Progress (?) in Understanding the Cerebral Water Diffusion MR Signal Change *in Vivo*", First Advanced Imaging Research Center Lecture, Oregon Health and Sciences University, Portland, OR, July 17, 2006.
- *292. "Water Diffusion in Mammalian Cells is NOT Slow" (Hot Topics oral presentation by Lin Zhao), *In Vivo* Magnetic Resonance Gordon Research Conference, Mount Holyoke College, South Hadley, MA, July 23-28, 2006.
- 293. "Water Diffusion in Mammalian Cells is NOT Slow" (poster presentation by Lin Zhao), *In Vivo* Magnetic Resonance Gordon Research Conference, Mount Holyoke College, South Hadley, MA, July 23-28, 2006.
- 292. "Intracellular Diffusion in Healthy and Ischemic Rat Brain" (poster presentation by James Goodman), *In Vivo* Magnetic Resonance Gordon Research Conference, Mount Holyoke College, South Hadley, MA, July 23-28, 2006.
- *291. "Diffusion-Sensitive Magnetic Resonance *in Vivo*: Many Questions - Some Answers." Biophysical Evenings, Washington University, Saint Louis, MO, February 6, 2007.
- *292. "Diffusion-Sensitive Magnetic Resonance *in Vivo*: Many Questions - Some Answers." University of Pennsylvania School of Medicine, Philadelphia, PA, April 5, 2007. (Invited by graduate students in biochemistry and biophysics program.)
- *293. "Magnetic Resonance Imaging and the Diffusion of Water – Physical Chemistry and Biophysics Meet Radiology.", Grinnell College, Grinnell, IA, April 18, 2007.
- *294. "Magnetic Resonance Imaging and the Diffusion of Water – Physical Chemistry and Biophysics Meet Radiology." Union University, Jackson, TN, May 4, 2007.
- 295. "Intracellular Diffusion in Normal and Ischemic Rat Tissues via ¹³³Cs MR at 12 T." (Oral presentation given by James Goodman), 15th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Berlin, Germany, May 19-25, 2007.
- 296. "Diffusion and Chemical Shift of Intracellular Cesium Ions within Perfused HeLa Cells." (Oral presentation given by Lin Zhao), 15th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Berlin, Germany, May 19-25, 2007.
- 297. "Improved Proton NMR Thermometry by Field Inhomogeneity Correction Post-Processing." (Poster presentation given by Mingming Zhu), 15th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Berlin, Germany, May 19-25, 2007.
- *298. "Fundamentals of Magnetic Resonance." First Annual NCI-Sponsored Cancer Research Imaging Camp, Duke University, Durham, NC, June 24-29, 2007.
- *299. "Magnetic Resonance Imaging and the Diffusion of Water: Physical Chemistry and

Biophysics Meet Radiology." University of Missouri, Columbia, MO, August 31, 2007.

- *300. "Horizons of Hyperpolarization: The Good, the Bad, the Ugly, and the Very Good." (Lecture given as an introduction to the Horizons of Hyperpolarization session.) Imaging in 2020 V: Theragnostic Imaging, Jackson Lake Lodge, Jackson Hole, WY, September 23-27, 2007.
- *301. "Biophysical Determinants of the Magnetic Resonance Signal *in Vivo*." 6th Bi-Annual 2007 Minnesota Workshops on High Field MR Imaging and Spectroscopy and MR Imaging of Brain Function, University of Minnesota, Minneapolis, MN, October 5-7, 2007.
- *300. "Hyperpolarization: The Good, the Bad, and the Ugly." (Lecture given as an introduction to the New Frontiers session.) 6th Bi-Annual 2007 Minnesota Workshops on High Field MR Imaging and Spectroscopy and MR Imaging of Brain Function, University of Minnesota, Minneapolis, MN, October 5-7, 2007.
- *302. "Progress toward understanding the MR diffusion signal in vivo." 16th Triennial Meeting of the International Society of Magnetic Resonance, Howard Beach Resort, Kenting National Park, Taiwan, October 14–19, 2007.
- *303. "The Biophysics of Diffusion Sensitive Magnetic Resonance in Living Systems." Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan, October 22, 2007.
- *304. "Exploring the Physical Chemistry of Living Systems with Magnetic Resonance." National Taiwan University, Taipei, Taiwan, October 22, 2007.
- *305 "Toward a More Quantitative Understanding of the MR Diffusion Signal." Paul C. Lauterbur Memorial Symposium, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, March 26-28, 2008.
- *306 "31P NMR in Vivo Studies of Glyphosate Uptake in Biotypes of Horseweed: Towards an Understanding of the Mechanism of Glyphosate Resistance in *Conyza canadensis*." (Oral presentation given by Andre' d'Avignon) Monsanto/Washington University Plant Science Program Annual Symposium, Charles Knight Center, Danforth Campus, Washington University, April 15, 2008.
- 307 "Magnetic Resonance Diffusion Characteristics of Histologically Defined Prostate Cancer in Humans." (Oral presentation given by Junqian Xu) 16th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Toronto, Canada, May 3-9, 2008.
- 308 "Tissue (Brain) Water Longitudinal Relaxation is Biexponential" (Oral presentation given by Andrew Prantner) 16th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Toronto, Canada, May 3-9, 2008.
- *309 "Progress (?) Toward Understanding Water Diffusion in Living Systems and Why You Should Care." Chicago Area NMR Discussion Group, Washington University, Saint Louis, November 8, 2008.

- *310 “Towards Understanding Water Diffusion in Living Systems: A Central Problem in MRI.” Pittsburgh Symposium on Cellular and Molecular Imaging, Carnegie Mellon University, Pittsburgh, April 3-4, 2009.
- 311 “Contribution of Protein-Induced Magnetic Susceptibility and ^1H Exchange Effects to Water MR Frequency Shifts.” (Oral presentation by Jie Luo) 17th Scientific Meeting of the International Society for Magnetic Resonance in Medicine, Honolulu, Hawaii, April 18-24, 2009.