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Education

1984–1990	Stanford University	German Studies	B.A.
1984–1990	Stanford University	Materials Science & Engineering (honors)	B.S.
1992–1999	Harvard University Harvard-MIT Division of Health Sciences & Technology (HST) Medical Engineering Medical Physics program	Applied Physics	Ph.D.
1998–2000	Harvard Medical School	Medicine	M.D.

Positions and Employment

1998-2000	Post-doctoral Fellow, MGH-NMR Center, Massachusetts General Hospital, Boston, MA
2000-2001	Internship, Internal Medicine, Robert Wood Johnson University Hospital, University of Medicine and Dentistry of New Jersey (UMDNJ), New Brunswick, NJ
2001-2006	Resident/Fellow, Diagnostic Radiology/Neuroradiology (3:2), University of California at San Francisco (UCSF), San Francisco, CA
2006	Acting Assistant Professor Stanford University/Stanford University Medical Center, Neuroradiology Section
2006-2012	Assistant Professor of Radiology – University Tenure Line Stanford University/Stanford University Medical Center, Neuroradiology Section
2012-2018	Associate Professor of Radiology – University Tenure Line Stanford University/Stanford University Medical Center, Neuroradiology Section
2015	Visiting Professor, Department of Neurology, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany
2017-to date	Associate Section Chief for Research Stanford University/Stanford University Medical Center, Neuroradiology Section
2018-to date	Professor of Radiology – University Tenure Line Stanford University/Stanford University Medical Center, Neuroradiology Section

Awards and Honors

1987 Tau Beta Pi
1988 German Academic Exchange Service (DAAD) National Scholarship
1989 Phi Beta Kappa
1989 Valedictorian, Materials Science & Engineering, Stanford University
1996 National Science Foundation (NSF) Japan Summer Institute Fellow
1998 American Heart Association (AHA), Mordecai Y. T. Globus Young Investigator Award in Stroke
1998 International Society of Magnetic Resonance in Medicine (ISMRM), Young Investigator Finalist
2002 RSNA Roentgen Resident/Fellow Research Award
2003 UCSF Margulis Society Excellence in Research Award
2004 GE Healthcare ISMRM Fellowship
2005 UCSF Resident Research Award
2006 Executive Council Award, American Roentgen Ray Society
2009 Neuroradiology Education Research Foundation Scholar Award (ASNR)
2011 ASNR Outstanding Presentation Award in General Neuroradiology (Senior Author)
2012 Visiting Professorship, Department of Radiology, Emory University, Grand Rounds Speaker
2012 ASNR Outstanding Presentation Award in General Neuroradiology (First Author)
2014 Mentor for Thomas Christen, Young Investigator Award Winner, ISMRM 2014 (Senior Author)
2016 Visiting Professorship, Department of Radiology, University of Toronto
2016 Editor's Recognition Award for Reviewing with Distinction, *Radiology* journal
2016 Distinguished Investigator Award, The Academy for Radiology & Biomedical Imaging Research
2017 American Society of Neuroradiology International Outreach Professorship, Ukraine
2017 Outstanding Teacher Award, International Society of Magnetic Resonance in Medicine
2019 1st Place Team Stanford HealthcareAI Hackathon, "Stroke De-coded" (mentor)
2020 Fellow, American Institute of Medicine and Biological Engineering (AIMBE)
2021 Lucien Levy Award for Best Paper in the American Journal of Neuroradiology
2021 AI Activator Award, from the *Imaging Wire* online journal
2021 Semi-finalist, Most Effective Educator, Aunt Minnie
2022 Top cited original article in JMRI 2020-21: "Deep Learning Enables Automatic Detection and Segmentation of Brain Metastases on Multisequence MRI", senior author
2023 Outstanding Contributions in Research Award, American Society of Neuroradiology (ASNR)
2024 Lucien Levy Award for Best Paper in the American Journal of Neuroradiology
2024 Nehal and Jenny Fan Raj Stanford COLLEGE Faculty Fellow

Patents

"Contrast Dose Reduction for Medical Imaging Using Deep Learning," Continuation US Patent #11,935,231, issued 3/19/2024, co-authored with Enhao Gong and John Pauly, Stanford.

"Systems and Methods using Machine Learning for Improved Prognostics in Medical Imaging," US Provisional Patent 63/137,626, filed 4/7/2021.

‘‘Methods of Predicting Disorder Progression for Control Arms Within an Experimental Trial," US Patent Application 16/892,158, filed 6/3/2020, allowed 7/3/2023.

‘‘System and Method for Synthetic Magnetic Resonance Imaging," U.S. Provisional Application No. 62/631,102, filed 2/15/2018, co-authored with Enhao Gong and John Pauly, Stanford.

"System and Method for Magnetic Resonance Imaging an Object via a Stochastic Optimization of a Sampling Function," US Patent No. 10,775,466, issued 9/5/2020, co-authored with Suchandra Banerjee, Enhao Gong, and John Pauly, Stanford.

“MRI Reconstruction using Deep Learning, Generative Adversarial Network and Acquisition Signal Model”, US Patent No. 10,859,657, issued 12/8/20, co-authored with Enhao Gong, John Pauly, and Morteza Mordani, Stanford.

“Contrast Dose Reduction for Medical Imaging Using Deep Learning,” US Patent #10,997,716 submitted 10/9/2017, allowed 2/9/2021; issued 5/4/2021, co-authored with Enhao Gong and John Pauly, Stanford.

“Dose Reduction for Medical Imaging Using Deep Convolutional Neural Networks,” US Patent No. 11,361,431, issued June 14, 2022, co-authored with Enhao Gong and John Pauly, Stanford.

“Improving Quality of Medical Images Using Multi-Contrast and Deep Learning,” US Patent No. 10,096,109, issued Oct 9, 2018, co-authored with Enhao Gong and John Pauly, licensed to Subtle Medical.

“Arterial Spin Labeling MRI-based Correction Factor for Improving Quantitative Accuracy of Blood Flow and Volume Images,” US Patent No. 8,929,972, issued Jan. 6, 2015, co-authored with Roland Bammer, Stanford.

“Method for Generating T1-weighted Magnetic Resonance Images and Quantitative T1 Maps,” US Patent No. 7,276,904, issued Oct. 2, 2007, co-authored with Reed Busse, John Pauly, GE Healthcare.

“Method and Apparatus of Background Suppression in MR imaging using Spin Locking,” US Patent No. 7,064,545, issued Jun 20, 2006, co-authored with Jean Brittain, assigned to GE Healthcare and Regents of the University of California.

"Grain Boundary Junctions in High Temperature Superconductor Films"
US Patent No. 5,157,466, issued Oct. 20, 1992, assigned to Conductus, Inc.

Licenses

California Medical License No. A77063, exp 1/31/2027

NPI 1376653675

Board Certification

American Board of Radiology, Diagnostic Radiology, 6/7/2005, recertified 6/7/2014, exp 6/6/2024, maintenance of certification pathway.

Certificate of Added Qualification (CAQ) – Neuroradiology, 11/4/2007, continuing compliance

Professional Memberships and Scholarly Activities

- Reviewer for *Radiology*, *Magnetic Resonance in Medicine, American Journal of Neuroradiology, Neuroimage, Stroke, Journal of Cerebral Blood Flow and Metabolism, Journal of Magnetic Resonance Imaging, American Journal of Roentgenology, Neuroradiology, NMR in Biomedicine*, *MAGMA, BMC Medicine, Neuroradiology, PLOS-One, Radiology:AI,* and *the Proceedings of the National Academy of Science (PNAS)*.
- Senior Member, American Society of Neuroradiology, 2005-
- Member, American Society of Functional Neuroradiology (ASFNR), 2016-
- Member, International Society of Magnetic Resonance in Medicine, 1995-

- Member, Radiological Society of North America, 2001-
- Member, International Society of Cerebral Blood Flow and Metabolism (ISCBFM)
- Member, Stroke Imaging Research Consortium
- Member, American College of Radiology Imaging Network (ACRIN) Neuroscience Committee
- Member, American College of Radiology CSC Subcommittee for the revision of the Practice Guideline for the Performance and Interpretation of Intracranial Magnetic Resonance Bolus Perfusion Imaging
- Member, American College of Radiology CSC Subcommittee for the revision of the Practice Guideline for the Performance and Interpretation of Functional Magnetic Resonance Imaging
- Member, American College of Radiology, 2023-

Service to Professional Organizations

- Treasurer, American Society of Functional Neuroradiology, 2016-17
- Secretary, American Society of Functional Neuroradiology, 2017-18
- Vice-president, American Society of Functional Neuroradiology, 2018-19
- President Elect, American Society of Functional Neuroradiology, 2019-21
- President, American Society of Functional Neuroradiology, 2021-22
- Immediate Past President, American Society of Functional Neuroradiology, 2022-23
- Secretary, ISMRM PET/MRI Study Group, 2017
- Vice-president, ISMRM PET/MRI Study Group, 2018
- President, ISMRM PET/MRI Study Group, 2019
- Research Committee, American Society of Neuroradiology (ASNR), 2012-
- Program Committee, American Society of Neuroradiology (ASNR) Annual Meeting, 2014-2017
- Education Committee, American Society of Neuroradiology (ASNR), 2012-
- Scientific Program Committee, Neuroradiology/Head & Neck Subcommittee, Radiological Society of North America (RSNA), 2012-
- Member of the Public Information Advisors Network (PIAN), Radiological Society of North America (RSNA), 2018-
- Education Committee, International Society of Magnetic Resonance in Medicine (ISMRM), 2012-
- Annual Meeting Program Committee, International Society of Magnetic Resonance in Medicine (ISMRM), 2012-15
- Reviewer, Natural Sciences and Engineering Research Council of Canada
- Reviewer, Netherlands Technology Foundation (STW OTP)
- Reviewer, Swiss National Science Foundation
- NIH Study Section: NINDS: ZNS1 SRB N11 R35 Review Meeting, March 2016
- NIH Study Section: NINDS: Acute Neural Injury and Epilepsy (ANIE), Bethesda, MD, June 2016.
- NIH Study Section: NINDS: Acute Neural Injury and Epilepsy (ANIE), Bethesda, MD, Oct 2017.
- NIH Study Section: NINDS: Acute Neural Injury and Epilepsy (ANIE), San Francisco, CA, Feb 2018.

- NIH Study Section: NINDS: Acute Neural Injury and Epilepsy (ANIE), virtual, Feb 2022.
- NIH Study Section: NINDS: Acute Neural Injury and Epilepsy (ANIE), virtual, Feb 2023.
- Chair, Organizing Committee, ISMRM Workshop on Machine Learning, March 2018.
- Chair, Organizing Committee, ISMRM Workshop on Machine Learning Part 2, Oct 2018.
- Co-chair, Organizing Committee, ASFNR Artificial Intelligence Workshop, 2019-22
- Editorial Board, *Radiology*, 2016-
- Deputy Editor, *Journal of Magnetic Resonance Imaging*, 2018-
- Editorial Board, Special Consultant to the Editor, *American Journal of Neuroradiology (AJNR),* 2011-23
- Board of Trustees, International Society of Magnetic Resonance in Medicine (ISMRM), 2021-24
- RSNA Quantitative Imaging Biomarker Alliance (QIBA) Taskforce, 2022-23.
- Steering Committee, Alzheimer's Network (ALZNET), American College of Radiology, 2022-23.
- Thesis viva examiner for Oxford PhD student Emma Bluemke 5/2023.
- Co-chair, Research Committee, American Society of Neuroradiology 2023-
- Co-chair, AI Ad Hoc Task Force, American Society of Neuroradiology 2023-
- Member, Advisory Council, American Society of Neuroradiology 2023-
- Editorial Board, Special Editor for Artificial Intelligence, *American Journal of Neuroradiology (AJNR),* 2023-
- Member, American College of Radiology, Neuroradiology Commission, 2024-
- Member, American College of Radiology, Dementia Workgroup, 2024-
- NIH Study Section 2025/05 NINDS SBIR Devices, Apr 2025.

Peer Reviewed Publications

(Google Scholar profile at https://scholar.google.com/citations?user=p__GE8MAAAAJ&hl=en)

1. Suzuki T, **Zaharchuk G**. Magnetic and MO properties and kinetics of rapid-thermally crystallized Bi-substituted garnet films. *IEEE Trans Magns* 1990; 26:1927.
2. Char K, Colclough MS, Garrison SM, Newman N, **Zaharchuk G**, Bi-epitaxial grain boundary junctions in YBa2Cu3O7, *Appl Phys Lett* 1991; 59:733-738.
3. Miklich AH, Kingston JJ, Wellstood FC, Clarke J, Colclough MS, Char K, **Zaharchuk G**, Sensitive YBa2Cu3O7-x thin-film magnetometer, *Appl Phys Lett* 1991; 59: 988-990.
4. Lee LP, Char K, Colclough MS, **Zaharchuk G**, Monolithic 77 K dc SQUID magnetometer, *Appl Phys Lett* 1991; 59:3051-3055.
5. Miklich AH, Wellstood FC, Kingston JJ, Clarke J, Colclough MS, Char K, **Zaharchuk G**, Thin-film YBCO magnetometer, *Nature* 1991; 352:482.
6. Rosner SJ, Char K, **Zaharchuk G**, Microstructure of bi-epitaxial grain boundary in YBCO, *Appl Phys Lett* 1992; 60:1010-1015.
7. Caramia F, Huang Z, Hamberg LM, Weisskoff RM, **Zaharchuk G**, Moskowitz MA, Cavagna FM, Rosen BR, Mismatch between cerebral blood volume and flow index during transient focal ischemia studied with MRI and Gd-BOPTA, *Magn Reson Imag* 1997; 16:97-103.

8. Caramia F, Yoshida T, Hamberg LM, Huang Z, Hunter G, Wanke I, **Zaharchuk G**, Moskowitz MA, Rosen BR, Measurement of changes in cerebral blood volume in spontaneously hypertensive rats following L-arginine infusion using dynamic susceptibility contrast MRI, *Magn Reson Med* 1997; 39:160-163.

9. **Zaharchuk G**, Hara H, Huang PL, Fishman MC, Moskowitz MA, Jenkins BG, Rosen BR, Neuronal nitric oxide synthase mutant mice show smaller infarcts and attenuated apparent diffusion coefficient changes in the peri-infarct zone during focal cerebral ischemia, *Magn Reson Med* 1997; 37:170-175.

10. **Zaharchuk G**, Bogdanov AA Jr., Marota JJA, Shimizu-Sasamata M, Weisskoff RM, Kwong KK, Jenkins BG, Weissleder R, Rosen BR, Continuous Assessment of Perfusion by Tagging Including Volume and water Extraction (CAPTIVE): a steady-state contrast agent technique for measuring blood flow, relative blood volume fraction, and the water extraction fraction, *Magn Reson Med* 1998; 40:666-678.

11. Mandeville JB, Marota JJA, Ayata C, **Zaharchuk G**, Moskowitz MA, Rosen BR, Weisskoff RM, Evidence of a cerebrovascular post-arteriole Windkessel with delayed compliance, *J Cereb Blood Flow Metab* 1999; 19:679-689.

12. **Zaharchuk G**, Ledden PJ, Kwong KK, Reese TG, Rosen BR, Wald LL, Multislice perfusion and perfusion territory imaging in humans with separate label and image coils, *Magn Reson Med* 1999; 41:1093-1098.

13. **Zaharchuk G**, Mandeville JB, Bogdanov AA Jr., Weissleder R, Rosen, BR, Marota JJA, Cerebrovascular dynamics of autoregulation and hypoperfusion: an MRI study of cerebral blood volume and CBF during hemorrhagic hypotension, *Stroke* 1999; 30:2197-2205.

14. **Zaharchuk G**, Yamada M, Shimizu-Sasamata M, Jenkins BG, Moskowitz MA, Rosen BR, Is all perfusion-weighted magnetic resonance imaging for stroke equal? The temporal evolution of multiple hemodynamic parameters after focal ischemia in rats correlated with evidence of infarction, *J Cereb Blood Flow Metab* 2000; 20:1341-1351.

15. **Zaharchuk G**, Martin AJ, Rosenthal G, Manley GT, Dillon WP, Measurement of cerebrospinal fluid oxygen partial pressure in humans with MRI, *Magn Reson Med* 2005; 54:113-121.

16. Wintermark M, Sesay M, Barbier E, Borbély K, Dillon WP, Eastwood JD, Glenn TC, Grandin CB, Pedraza S, Soustiel, J-F, Nariai T, **Zaharchuk G**, Caillé J-M, Dousset V, Yonas H, Comparative overview of brain perfusion imaging techniques, *Stroke* 2005; 36:2032-2048.

17. **Zaharchuk G**, Busse RF, Rosenthal G, Manley GT, Glenn OA, Dillon WP, Noninvasive oxygen partial pressure measurement of human body fluids *in vivo* using magnetic resonance imaging, *Acad Radiol* 2006; 13:1016-1024.

18. **Zaharchuk G**, Theoretical basis of magnetic resonance imaging techniques to measure cerebral blood volume, cerebral blood flow, and permeability, *Am J Neurorad* 2007; 28:1850-1858.

19. **Zaharchuk G**, Martin AJ, Dillon WP, Noninvasive imaging of quantitative cerebral blood flow changes during 100% oxygen inhalation using arterial spin-labeling MR imaging, *Am J Neurorad* 2008; 29:663-667.

20. Wang ZJ, Joe BN, Coakley FV, **Zaharchuk G**, Busse RF, Yeh BM, Urinary oxygen tension measurement in humans using MR imaging, *Acad Radiol* 2008; 15:1467-1473.

21. Vertinsky, AT, Schwartz NE, Fischbein NJ, Rosenberg J, Albers GW, **Zaharchuk G**, Comparison of multidetector CT angiography and magnetic resonance imaging of cervical artery dissection, *Am J Neurorad* 2008; 29:1753-1760.

22. Hsu JJ, **Zaharchuk G**, Glover GH, Rapid methods for concurrent measurement of the RF-pulse flip angle and the longitudinal relaxation time, *Magn Reson Med* 2009; 61(6):1319-1325.

23. Olivot J-M, Mlynash M, **Zaharchuk G**, Straka M, Bammer R, Schwartz NE, Lansberg MG, Moseley ME, Albers GW, Perfusion-magnetic resonance imaging Tmax and mean transit time correlate with stable xenon computed tomography cerebral blood flow in stroke patients, *Neurology* 2009; 72:1140-1145.

24. Hsu J-J, Glover GH, **Zaharchuk G**, Optimizing saturation-recovery measurements of the longitudinal relaxation rate under time constraints, *Magn Reson Med* 2009; 62:1202-10.

25. **Zaharchuk G**, Bammer R, Straka M, Newbould RD, Rosenberg J, Olivot J-M, Mlynash M, Lansberg MG, Schwartz NE, Marks MP, Albers GW, Moseley ME, Improving dynamic susceptibility contrast MRI measurement of quantitative cerebral blood flow using corrections for partial volume and nonlinear contrast relaxivity: a xenon CT comparative study, *J Magn Reson Imag* 2009; 30:743-752.

26. **Zaharchuk G**, Bammer R, Straka M, Shankaranarayan A, Alsop DC, Fischbein NJ, Atlas SW, Moseley ME, Arterial spin label images in patients with normal bolus perfusion-weighted magnetic resonance imaging – pilot identification of the "borderzone sign", *Radiology* 2009; 252:797-807.

27. **Zaharchuk G,** Straka M, Marks MP, Albers GW, Moseley ME, Bammer R, Combined arterial spin label and dynamic susceptibility contrast measurement of cerebral blood flow, *Magn Reson Med* 2010; 63:1548-56.

28. Kapinos G, Fischbein NJ, **Zaharchuk G**, Venkatasubramanian C, Migraine-like headache with visual deficit and perfusion abnormality on MRI, *Neurology* 2010; 74:1743-5.

29. **Zaharchuk G**, Arterial spin label imaging of acute ischemic stroke and transient ischemic attack, *Neuroimag Clin N Amer* 2011; 21:285-301.

30. **Zaharchuk G,** Saritas EU, Andre JB, Chin CT, Rosenberg J, Brosnan TJ, Shankaranarayan A, Nishimura DG, Fischbein NJ, Reduced field-of-view diffusion imaging of the human spinal cord: comparison with conventional single-shot echo-planar imaging, *Am J Neurorad* 2011 32:813-20.

31. Ganguly A, Fieselmann A, Marks M, Rosenberg J, Boese J, Deuerling-Zheng Y, Straka M, **Zaharchuk G**, Bammer R, Fahrig R, Cerebral perfusion CT (PCT) using an interventional C-arm imaging system: cerebral blood flow (CBF) measurements, *Am J Neurorad* 2011; 32:1525-31.

32. **Zaharchuk G**, Fischbein NJ, Rosenberg J, Herfkens RJ, Dake MD, Comparison of magnetic resonance and contrast venography of the cervical venous system in multiple sclerosis, *Am J Neurorad* 2011; 32:1482-9.

33. **Zaharchuk G**, Do HM, Marks MP, Rosenberg J, Moseley ME, Steinberg GK, Arterial spin labeling MRI can identify the presence and intensity of collateral perfusion in patients with Moyamoya disease, *Stroke* 2011; 42:2485-91.

34. Le TT, Fischbein NJ, Andre JB, Wijman C, Rosenberg J, **Zaharchuk G**, Identification of venous signal on arterial spin labeling improves diagnosis of dural arteriovenous fistulae and small arteriovenous malformations, *Am J Neurorad* 2012; 33:61-8

35. Christen T, Lemasson B, Pannetier N, Farion R, Remy C, **Zaharchuk G**, Barbier EL, Is T2* enough to assess oxygenation? A quantitative blood-oxygen level dependent analysis in brain tumor, *Radiology* 2012; 262:495-502.

36. Schmiedeskamp H, Straka M, Newbould RD, **Zaharchuk G**, Andre JB, Olivot J-M, Moseley ME, Albers GW, Bammer R, Combined spin- and gradient-echo perfusion-weighted imaging, *Magn Reson Med* 2012; 68:30-40.

37. Christen T, Schmiedeskamp H, Straka M, Bammer R, **Zaharchuk G**, Measuring brain oxygenation in humans using a multiparametric quantitative blood oxygenation level dependent MRI approach, *Magn Reson Med* 2012; 68:905-11.

38. McTaggart RA, Fischbein NJ, Elkins CJ, Hsiao A, Cutalo MJ, Rosenberg J, Dake MD, **Zaharchuk G,** Extracranial venous drainage patterns in multiple sclerosis patients and normal controls, *Am J Neurorad* 2012; 33:1615-20.

39. Andre JB, **Zaharchuk G**, Fischbein NJ, Augustin M, Skare S, Rosenberg J, Lansberg MG, Kemp S, Wijman C, Albers GW, Bammer R, Clinical assessment of standard and GRAPPA parallel diffusion imaging: effects of acceleration factor and spatial resolution, *Am J Neurorad* 2011; 33:1337-42.

40. Christen T, **Zaharchuk G**, Pannetier N, Serduc R, Joudiou N, Vial JC, Remy C, Barbier EL, Quantitative MR estimates of blood oxygenation based on T2*: a numerical study of the impact of model assumptions, *Magn Reson Med* 2012; 67:1458-68.

41. Qiu D, Bammer R, Straka M, Moseley ME, **Zaharchuk G**, CBF measurements using multidelay pseudocontinuous and velocity-selective arterial spin labeling in patients with long arterial transit delays: comparison with xenon CT CBF, *J Magn Reson Imag* 2012; 36:110-9.

42. Andre JB, **Zaharchuk G**, Saritas EU, Komakula S, Shankaranarayan A, Banerjee S, Rosenberg J, Nishimura DG, Fischbein NJ, Clinical evaluation of reduced field-of-view diffusion imaging of the cervical and thoracic spine and spinal cord, *Am J Neurorad* 2012; 33:1860-6.

43. **Zaharchuk G**, El-Mogy IS, Fischbein NJ, Albers G, Comparison of arterial spin labeling and bolus perfusion-weighted imaging for detecting mismatch in acute stroke, *Stroke* 2012 43:1843-8.

44. Christen T, Bolar DS, **Zaharchuk G**, Imaging brain oxygenation with MRI using blood oxygenation approaches: methods, validation, and clinical applications, *Am J Neurorad* 2012; 34: 1113-23.

45. Kleinman JT, **Zaharchuk G**, Mlynash M, Ogdie AA, Straka M, Lansberg MG, Schwartz NE, Kemp S, Bammer R, Albers GW, Olivot J-M, Automated perfusion imaging for the evaluation of transient ischemic attack, *Stroke* 2012; 43:1556-60.

46. Qiu D, **Zaharchuk G**, Christen T, Ni WW, Moseley ME, Contrast-enhanced functional blood volume imaging (ce-fBVI): enhanced sensitivity for brain activation in humans using the ultrasmall superparamagnetic iron oxide agent ferumoxytol, *Neuroimage* 2012; 62:1726-31.

47. **Zaharchuk G,** Olivot J-M, Fischbein NJ, Bammer R, Straka M, Kleinman JT, Albers GW, Arterial spin labeling imaging findings in transient ischemic attack patients: comparison with diffusion- and bolus perfusion-weighted imaging, *Cerebrovasc Dis* 2012; 34:221-228.

48. Inoue M, Mlynash M, Straka M, Lansberg MG, **Zaharchuk G**, Bammer R, Albers GW, Patients with the malignant profile within 3 hours of symptom onset have very poor outcomes following IV tPA therapy, *Stroke* 2012; 43:2494-6.

49. Christen T, Ni W, Qiu D, Schmiedeskamp H, Bammer R, Moseley ME, **Zaharchuk G**, High-resolution cerebral blood volume imaging in humans using the blood pool contrast agent ferumoxytol, *Magn Reson Med* 2013; 70:705-10.

50. Lansberg MG, Straka M, Kemp S, Mlynash M, Wechsler LR, Jovin TG, Wilder MJ, Lutsep HL, Czartoski TJ, Bernstein RA, Chang CW, Warach S, Fazekas F, Inoue M, Tipirneni A, Hamilton SA, **Zaharchuk G**, Marks MP, Bammer R, Albers GW, MRI profile and response to endovascular reperfusion after stroke (DEFUSE 2): a prospective cohort study, *Lancet Neurol* 2012; 11: 860-7.

51. Schmiedeskamp H, Andre JB, Straka M, Christen T, Nagpal S, Recht L, Thomas R, **Zaharchuk G**, Bammer R, Simultaneous perfusion and permeability measurements using combined spin- and gradient-echo MRI, *J Cereb Blood Flow Metab* 2013; 33:732-43.

52. Wheeler HM, Mlynash M, Inoue M, Tipirneni A, Liggins J, **Zaharchuk G**, Straka M, Kemp S, Bammer R, Lansberg MG, Albers GW; DEFUSE 2 Investigators, Early diffusion-weighted imaging and perfusion-weighted imaging lesion volumes forecast final infarct size in DEFUSE 2, *Stroke* 2013; 44:681-5.

53. Alexander M, McTaggart RA, Santarelli JG, Fischbein NJ, Marks MP, **Zaharchuk G**, Do HM, Multimodality evaluation of dural arteriovenous fistula with CT angiography, MR with arterial spin labeling, and digital subtraction angiography: case report, *J Neuroimaging* 2014; 24:520-3.

54. Zun Z, Hargreaves BA, Pauly J, **Zaharchuk G**, Near-contiguous spin echo imaging using matched-phase RF and its application in velocity-selective arterial spin labeling, *Magn Reson Med* 2013*;* 71:2043-50.

55. Wintermark M, Albers G, et al., **Zaharchuk G**, et al., Warach S (30 authors in all), Acute stroke imaging research roadmap II, *Stroke* 2013; 44:2628-39.

56. Wintermark M, Sanelli PC, Albers GW, Bello JA, Derdeyn CP, Hetts SW, Johnson MH, Kidwell CS, Lev MH, Liebeskind DS, Rowley HA, Schaefer PW, Sunshine JL, **Zaharchuk G**, Meltzer CC, Imaging recommendations for acute stroke and transient ischemic attack patients: a joint statement by the American Society of Neuroradiology, the American College of Radiology and the Society of NeuroInterventional Surgery*, J Am Coll Radiol* 2013; 10:828-32.

57. Christen T, Pannetier NA, Ni WW, Qiu D, Moseley ME, Schuff N, **Zaharchuk G**, MR vascular fingerprinting: a new approach to compute cerebral blood volume, mean vessel radius, and oxygenation maps in the human brain, *Neuroimage* 2014; 89:262-70.

58. Marks MP, Lansberg MG, Mlynash M, Kemp S, McTaggart R, **Zaharchuk G**, Bammer R, Albers GW; for the DEFUSE 2 Investigators, Correlation of AOL recanalization, TIMI reperfusion and TICI reperfusion with infarct growth and clinical outcome*, J Neurointerv Surg* 2014; 6:724-8.

59. Christen T, Jahanian H, Ni WW, Qiu D, Moseley ME, **Zaharchuk G**, Noncontrast mapping of arterial delay and functional connectivity using resting-state functional MRI: a study in Moyamoya patients, *J Magn Reson Imag* 2015; 41:424-30.

60. Zeineh MM, Parekh MB, **Zaharchuk G**, Su JH, Rosenberg J, Fischbein NJ, Rutt BK, Ultrahigh-resolution imaging of the human brain with phase-cycled balanced steady-state free precession at 7.0 T, *Invest Radiol* 2014; 49:278-89.

61. Alsop DC, Detre J, Golay X, Guenther M, Hendrikse J, Hernandez-Garcia L, Lu H, MacIntosh BJ, Parkes L, Smits M, van Osch M, Wang D, Wong EC, **Zaharchuk G**, Recommended implementation of arterial spin labeled perfusion MRI for clinical applications: a consensus of the ISMRM Perfusion Study Group and the European Consortium for ASL in Dementia, *Magn Reson Med* 2015; 73:102-16.

62. Iv M, Fischbein NJ, **Zaharchuk G**, Association of developmental venous anomalies with perfusion abnormalities on arterial spin labeling and bolus perfusion-weighted imaging, *J Neuroimaging* 2014; 25(2):243-50.

63. Marks MP, Lansberg MG, Mlynash M, Olivot JM, Straka M, Kemp S, McTaggart R, Inoue M, **Zaharchuk G**, Bammer R, Albers GW, Effect of collateral blood flow on patients undergoing endovascular therapy for acute ischemic stroke, *Stroke* 2014; 45:1035-9.

64. Inoue M, Mlynash M, Christensen S, Wheeler HM, Straka M, Tipirneni A, Kemp SM, **Zaharchuk G**, Olivot JM, Bammer R, Lansberg MG, Albers GW, Early diffusion-

weighted imaging reversal after endovascular reperfusion is typically transient in patients imaged 3 to 6 hours after onset, *Stroke* 2014; 45:1024-8.

65. Marks MP, Lansberg MG, Mlynash M, Kemp S, McTaggart RA, **Zaharchuk G**, Bammer R, Albers GW; DEFUSE Investigators, Angiographic outcome of endovascular stroke therapy correlated with MR findings, infarct growth, and clinical outcome in the DEFUSE-2 trial, *Int J Int J Stroke* 2014; 9:860-5.

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22. Zhu G, Jiang B, Chen H, Tong E, Xie Y, Faizy TD, Heit JJ, **Zaharchuk G**, Wintermark M, Artificial intelligence and stroke imaging: a west coast perspective, *Neuroimaging Clin N Am* 2020; 30:479-492.
23. **Zaharchuk G**, Davidzon G, Artificial intelligence for optimization and interpretation of PET/CT and PET/MR images, *Sem Nucl Med* 2021; 51:134-142.
24. Ouyang J, Adeli E, Pohl KM, Zhao Q, **Zaharchuk G**, Representation disentanglement for multi-modal brain MRI analysis, *Proc Information Processing in Medical Imaging (IPMI)* 2021.
25. Yu Y, Heit JJ, **Zaharchuk G**, Improving ischemic stroke care with MRI and deep learning artificial intelligence, *Trends Magn Reson Imag* 2021; 30:187-195.
26. Federau C, Scalzo F, Lee-Messer CW, **Zaharchuk G**, Machine learning in neuroimaging, *Front Neurol* 2021; 12:778765.
27. Mallio CA, Radbruch A, Deike-Hofmann K, van der Molen AJ, Dekkers IA, **Zaharchuk G**, Parizel PM, Beomonte Zobel B, Quattrocchi CC, Artificial intelligence to reduce or eliminate the need for gadolinium-based contrast agents in brain and cardiac MRI: a literature review, *Invest Rad* 2023; in press.

28. Zhao MY, Tong E, Duarte Armindo R, Woodward A, Yeom KW, Moseley ME, **Zaharchuk G,** Measuring quantitative cerebral blood flow in healthy children: a systematic review of neuroimaging techniques, *J Magn Reson Imag* 2023; in press.

29. Seners P, Wouters A, Maïer B, Boisseau W, Gory B, Heit JJ, Cognard C, Mazighi M, Gaudilliere B, Lemmens R, **Zaharchuk G**, Albers GW, Leigh R, Olivot JM, Role of brain imaging in the prediction of intracerebral hemorrhage following endovascular therapy for acute stroke, *Stroke* 2023; 54:2192-2203.

30. Filippi CG, Stein JM, Wang Z, Bakas S, Liu Y, Chang PD, Lui Y, Hess CP, Barboriak DP, Flanders AE, Wintermark M, **Zaharchuk G**, Wu O, Ethical considerations and fairness in the use of artificial intelligence for neuroradiology, *Am J Neurorad* 2023; 44:1242-8.

31. Tsui B, Calabrese E, **Zaharchuk G**, Rauschecker AM, Reducing gadolinium usage with artificial intelligence, *J Magn Reson Imag* 2024; 60:848-859.

32. **Zaharchuk G**, Can imaging neuroinflammation with PET/MRI help us put out brain fires?, *Radiology* 2024; 310(3):e240322.

33. Tejani AS, Klontzas ME, Gatti AA, Mongan JT, Moy L, Park SH, Kahn CE Jr; **CLAIM 2024 Update Panel.** Checklist for Artificial Intelligence in Medical Imaging (CLAIM): 2024 Update. *Radiol Artif Intell* 2024 Jul;6(4):e240300.

34. **Zaharchuk G**, Mei J, The future of artificial intelligence in clinical radiology: savior or false hope? *Am J Neurorad* 2024; 45:1838-44.

35. Wang S, **Zaharchuk G**, Using generative artificial intelligence to improve image quality from ultra-low-field strength MR scanners, *Radiology* 2025; online ahead of print.

36. Wintermark M, Bhala R, Bykowski J, Cogswell PM, Emch T, Hoeffner E, Huston J, Liu HL, Radhakrishnan R, Romero JM, Saigal G, Sandhu J, Spampinato MV, Tanabe J, Tanwar M, Vachha B, White ML, **Zaharchuk G**, Zander D, Kennedy T. Supporting imaging research: a framework for equity and excellence in neuroradiology. *AJNR Am J Neuroradiol*. 2025;46(6):1065-1068.

37. Ivanidze J, Franceschi AM, Wintermark M, Jordan JE, Aboian M, Anderson JC, Assadsangabi R, Benayoun MD, Benzinger TLS, Chiang GC, Ebani EJ, Famuyide A, Galldiks N, Hu LS, Johnson DR, Johnson JM, Khalaf A, Knight-Greenfield A, Lohmann P, Moradi F, Nabavizadeh A, Nickerson JP, Pérez-Carrillo GJG, Pyatigorskaya N, Roytman M, Shepherd T, Singh G, Starkey J, Veronesi MC, Whitlow CT, Yildiz S, Zeineh M, **Zaharchuk G**, Raghavan P, Barajas RF Jr. ASNR Consensus Statement: Integrating Neuro-PET Interpretation into Neuroradiology Training and Practice. *AJNR Am J Neuroradiol*. 2025;Epub ahead of print.

38. England E, Meltzer CC, Levey AO, **Zaharchuk G**, Gadde JA. The future of radiology residency training. *J Am Coll Radiol*. 2025:S1546-1440(25)00459-4.

Non-peer-reviewed Publications

1. Wintermark M, Colen R, Whitlow CT, **Zaharchuk G**, Neuroimaging research, *Brainwatch*, European Society of Radiology 2017.

2. Mardani M, Gong E, Cheng JY, Vasanawala S, **Zaharchuk G**, Alley M, Thakur N, Han S, Dally W, Pauly JM, Xing L, Deep generative adversarial networks for compressed sensing automates MRI, *arXiv preprint* arXiv:1706.00051, 2017/05/31.

3. Xu J, Gong E, Pauly JM, **Zaharchuk G**, 200x low-dose PET reconstruction using deep learning, *arXiv preprint* arXiv:1712.04119, 2017/12/12.

4. Yi D, Grøvik E, Iv M, Tong E, **Zaharchuk G**, Rubin DL, Brain metastasis segmentation network trained with robustness to annotations with multiple false negatives, *arXiv preprint* arXiv:2001.09051, 2020/01/26.

5. Yi D, Grøvik E, Iv M, Tong E, Emblem KE, Nilsen LB, Saxhaug C, Latysheva A, Jacobsen KD, Helland Å, **Zaharchuk G**, Rubin DL, MRI pulse sequence integration for deep-learning based brain metastasis segmentation, arXiv preprint arXiv:1912.08775, 2019/12/18.

6. **Zaharchuk G**, Bias in AI, Stanford Diversity Newsletter, 2019/04/01.

7. Ouyang J, Zhao Q, Adeli E, Sullivan EV, Pfefferbaum A, **Zaharchuk G**, Pohl KM, Self-supervised longitudinal neighborhood embedding, ArXiv 2013.03840, 2021.

8. Yi D, Grøvik E, Iv M, Tong E, **Zaharchuk G**, Rubin DL, Random bundle: brain metastasis segmentation ensembling through annotation randomization, ArXiv 2002.09809

9. Liu J, Pasumarthi S, Duffy B, Gong E, **Zaharchuk G**, Datta K, One model to synthesize them all: multi-contrast multi-scale transformer for missing data imputation, ArXiv 2204.13738.

10. Reeder SB, Hess CP, **Zaharchuk G**, Moy L; on behalf of the ISMRM, Magnetic resonance imaging as an alternative to contrast-enhanced computed tomography to mitigate iodinated contrast shortages in the United States: recommendations from the International Society for Magnetic Resonance in Medicine, *J Magn Reson Imag* 2022; 56:655-6.

11. Wang D, Pasumarthi S, **Zaharchuk G**, Chamberlain R, Simulation of arbitrary level contrast dose in MRI using an iterative global transformer model, *ArXiv* 2023; 2307.11980 (accepted at MICCAI).

12. Khalighi MM, Young CB, Weiss S, Zeineh M, Davidzon G, Mormino E, **Zaharchuk G**, Enhancing the diagnostic accuracy of amyloid PET: the impact of MR-guided PET reconstruction, *MedRxiv* 2025; Jan 5:2025.01.04.25319996. doi: 10.1101/2025.01.04.25319996.

13. Kim DN, Ottesen JA, Kumar A, Ho BC, Bismuth E, Young CB, Mormino E, **Zaharchuk G**, Deep learning-based prediction of PET amyloid status using multi-contrast MRI, *arXiv* 2024; 2411.12061.

14. Dogra S, **Zaharchuk G**. The Career Academic-Career Pivots, an *AJR* Podcast Series (Episode 1). *AJR Am J Roentgenol.* 2025 Sep;225(3):e2533566. doi: 10.2214/AJR.25.33566. Epub 2025 Jul 23. PMID: 40699019.

Books

1. Barker PB, Golay X, **Zaharchuk G**, eds., "Clinical Perfusion MRI: Techniques and Applications", Cambridge University Press 2013.

Book Sections

1. Withers RS, Cole BF, Johansson ME, Liang GC, **Zaharchuk G**, HTS receiver coils for magnetic resonance instruments, In "High Tc Microwave Superconductors and Applications", eds. Hammond RB, Withers RS, Proc. SPIE, Bellingham, WA. 1994;2156: 27-35.
2. Wintermark M, Wirt MD, Mukherjee P, **Zaharchuk G**, Barbier E, Dillon WP, Brain, Modern Techniques and Anatomy. In: "Magnetic Resonance Tomography", eds. Reiser MF, Semmler W, Hricak, H, Berlin Heidelberg: Springer-Verlag; 2007.
3. **Zaharchuk G**, MR perfusion imaging in neurovascular disease, In: "Clinical MR Perfusion Imaging", eds. Barker P, Golay X, Zaharchuk G, Cambridge University Press; Cambridge, England; 2013.

4. Lin W, An H, Ford A, Vo K, Lee J-M, **Zaharchuk G**, Imaging of brain oxygenation, In: "Clinical MR Perfusion Imaging", eds. Barker P, Golay X, Zaharchuk G, Cambridge University Press; Cambridge, England; 2013.
5. Hendrikse J, **Zaharchuk G,** Perfusion imaging in chronic occlusive disease of intracranial vessels and vascular reserve testing, in "MR & CT Perfusion Imaging: Clinical Applications and Theoretical Principles", ed. Bammer R, Lippincott Williams & Wilkins; 2016.
6. Prabhakaran S, Kleinman J, **Zaharchuk G**, Olivot J-M, TIA and perfusion imaging, in "MR & CT Perfusion Imaging: Clinical Applications and Theoretical Principles", ed. Bammer R, Lippincott Williams & Wilkins; 2016.
7. Chwang WB, Fischbein NJ, **Zaharchuk G**, Radiology of meningiomas, in "Current Management of CNS Meningiomas", ed. Veeravagu A, Chang S, Nova Science Publishers; 2015.
8. Chukus A, **Zaharchuk G**, Arterial spin labeling: how to do it, in "Stroke Imaging: a Practical Guide", ed. Sanelli P, Wintermark M, Thieme Publishing Company; 2018.
9. Wang G, Gong E, Banerjee S, Pauly J, **Zaharchuk G**, Accelerated MRI reconstruction with dual-domain generative adversarial network, in "Machine Learning for Medical Image Reconstruction", ed. Knoll F, Maier A, Rueckert D, Ye JC, Springer Verlag; 2019.
10. Ouyang J, Wang G, Gong E, Chen K, Pauly J, **Zaharchuk G,** Task-GAN: improving generative adversarial network for image reconstruction, in "Machine Learning for Medical Image Reconstruction", ed. Knoll F, Maier A, Rueckert D, Ye JC, Springer Verlag; 2019.
11. Wang KQ, van Staalduinen, EK, **Zaharchuk G**, Perfusion MRI: Clinical Perspectives, in "Advanced Neuro Magnetic Resonance Techniques and Applications", ed. Choi IY, Jezzard P, Elsevier; 2021.
12. Chen K, **Zaharchuk G**, Image synthesis for low-count PET acquisitions: lower dose, shorter time, in "Biomedical Image Synthesis and Simulation: Methods and Applications", ed. Burgos N, Svoboda D, MICCAI/Elsevier book series, Elsevier; 2021.
13. Armindo RD, **Zaharchuk G**, Clinical applications of resting-state fMRI, in "Advances in Resting-State Functional MRI," ed. Chen J, Elsevier; 2022.
14. **Zaharchuk G**, Artificial intelligence approaches to the imaging of neurodegenerative diseases, in "Molecular Imaging of Neurodegenerative Diseases", ed. Mosci K, Minoshima S, Cross D, Springer; 2023.

Invited Presentations

1. **"**Stroke Imaging with MRI – not Dead Yet", Frontiers in Neurology and Neuroscience, UCSF Department of Neurology Grand Rounds, San Francisco, CA, 6/2004.
2. **"**Perfusion MR Imaging with Arterial Spin Labeling: Reliability and Technical Considerations", 7th International Conference on Xenon CT CBF and Related CBF Techniques. Bordeaux, France, 9/2004.
3. **"**Imaging of the Vessels and Parenchyma in Acute Stroke", El Camino Hospital Stroke Grand Rounds, Mountain View, CA, 4/2007.
4. **"**Overview and Comparison of Quantitative CBF Imaging Techniques", Keynote Speaker, 2nd International Symposium on Flow Measurement in Cerebrovascular Surgery, San Diego, CA, 9/2007.
5. **"**Neuroimaging in the Setting of Acute Stroke: Ischemic Penumbra Identification", Society of Neurointerventional Surgery (SNIS) Practicum, Vancouver BC, Canada 5/2009.
6. **"**Modern Acute Stroke Imaging: from Bench to Bedside", Western Neuroradiology Society (WNRS), Napa, CA 10/2009.
7. **"**Clinical Perfusion Imaging", European Society of Magnetic Resonance in Medicine and Biology (ESMRMB) Perfusion Workshop, Freiburg, Germany 10/2009.

8. **"**Why Do We Care About Perfusion?" Keynote Speaker, European Society of Magnetic Resonance in Medicine and Biology (ESMRMB) Perfusion Workshop, Freiburg, Germany 10/2009.
9. "Advances in the Diagnosis of Dissection: What Is the Best Test?" American Heart Association International Stroke Conference (ISC), San Antonio, TX, 2/2010.
10. "Stroke in 2010: Needs, Challenges, and Controversies," GE Healthcare Neuroradiology Advisory Board, 4/2010
11. "High-dose CT Brain Perfusion and the FDA: What Happened, How it Happened, and How to Prevent it From Happening to You", 1st International Symposium on Multidetector Row CT, San Francisco, CA, 5/2010
12. "Optimizing Arterial Spin Label MR Imaging for the Visualization of the Collateral Flow in Moyamoya Disease", American Society of Neuroradiology (ASNR) 48th Annual Meeting, Boston, MA, 5/2010
13. "Perfusion Methodology", American Society of Neuroradiology (ASNR) 48th Annual Meeting, Boston, MA, 5/2010
14. "Perfusion Imaging Methods in Clinical Practice", Radiological Society of North America (RSNA) 96th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2010
15. "The Future of Clinical Neuroradiology," Invited Speaker, Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Charlestown, MA, 6/2011
16. "Imaging Stroke and Transient Ischemic Attack" and "Vascular Imaging of the Central Nervous System", University of British Columbia Radiology Conference - Vancouver Imaging Review, Vancouver, BC, Canada, 9/2011
17. "Imaging Stroke and Transient Ischemic Attack with MRI", Society of Magnetic Resonance Technologists (SMRT) President's Regional Educational Seminar, Stanford, CA 10/2011
18. "Perfusion Imaging Methods in Clinical Practice", Radiological Society of North America (RSNA) 96th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2011
19. "Dual Energy CT Applications in Neuroradiology", Hot Topics Session, Radiological Society of North America (RSNA) 96th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2011
20. "A Brief History of Stroke Imaging", Grand Rounds, Visiting Professor, Department of Radiology, Emory University School of Medicine, Atlanta, GA, 1/2012
21. "Arterial Spin Label Imaging of Stroke and Transient Ischemic Attack", Foundation of the ASNR Symposium, New York City, NY, 4/2012
22. "Optimizing Arterial Spin Label Perfusion MRI for the Visualization of Collateral Flow in Moyamoya Disease", American Society of Neuroradiology (ASNR) 50th Annual Meeting, New York City, NY, 4/2012
23. "Patient Selection for Stroke Therapy using MR", Society for Neurointerventional Surgery (SNIS) Practicum, New York City, NY, 4/2012
24. "Dynamic Susceptibility Contrast versus Arterial Spin Labeling in Acute Stroke", ISMRM Perfusion Workshop, Amsterdam, Netherlands, 10/2012
25. "Future Directions for Perfusion MRI: the MD's Viewpoint", ISMRM Perfusion Workshop, Amsterdam, Netherlands, 10/2012
26. "Stroke MRI", Radiological Society of North America (RSNA) 97th Scientific Assembly and Annual Meeting, Chicago, IL, 11/2012
27. "The Next Generation of Functional Neuroimaging MR Methods", Keynote Speaker, 36th Annual Meeting of the Japan Society for CNS Computed Imaging, Hiroshima, Japan, 2/2013
28. "Stroke and the Myth of Quantification", ISMRM Educational Course, Salt Lake City, UT, 4/2013
29. "Extracranial Arterial Dissection: What Is the Best Test?", American Society of Neuro-radiology (ASNR) 51st Annual Meeting, San Diego, CA, 5/2013.

30. “Brain Imaging Controversies: CCSVI: Is There Venous Insufficiency in MS or Not? Pro”, American Society of Neuroradiology (ASNR) 51st Annual Meeting, San Diego, CA, 5/2013.
31. “Advances in Arterial Spin Labeling”, American Society of Neuroradiology (ASNR) 51st Annual Meeting, San Diego, CA, 5/2013.
32. “Emergency Triage of Acute Stroke”, MRI Head-to-Toe Educational Course, American College of Radiology, San Francisco, CA, 6/2013.
33. “Transient Ischemic Attack – the Next Neurological Emergency?”, MRI Head-to-Toe Educational Course, American College of Radiology, San Francisco, CA, 6/2013.
34. “Advanced Stroke Imaging”, Annual Meeting of the European Society of Neuroradiology (ESNR), Frankfurt, Germany, 10/2013.
35. “Quantitative MR Perfusion Imaging of the Brain”, Radiological Society of North America (RSNA) 98th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2013.
36. “Stroke MRI: Diffusion, Perfusion, and Beyond”, Radiological Society of North America (RSNA) 98th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2013.
37. “Standardization and Automation of Post-Processing: Critical Step for Current/Future Clinical Stroke Trials and Clinical Practice?”, American Society of Functional Neuroradiology, Miami, FL 2/2014.
38. “Applications of Perfusion MRI”, ISMRM Annual Meeting Educational Course, Milan, Italy 5/2014.
39. “Simultaneous Time-of-flight PET-MRI in Humans: Initial Experience”, ISMRM GE Healthcare Corporate Symposium, Milan, Italy 5/2014.
40. “ASL Perfusion – Is it Reliable in Advanced Steno-occlusive Disease?”, American Society of Neuroradiology (ASNR) 52st Annual Meeting, Montreal, Canada, 5/2014.
41. “Transient Ischemic Attack”, American Society of Neuroradiology (ASNR) 52st Annual Meeting, Montreal, Canada, 5/2014.
42. “Collaterals of Intracranial Atherosclerosis – Angiography or Noninvasive Imaging?”, Panel discussion, 2nd International Symposium on Collaterals to the Brain, Los Angeles, CA, 11/2014.
43. “Emergency Stroke Triage”, Radiological Society of North America (RSNA) 99th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2014.
44. “Next Generation of MR Functional Neuroimaging Methods”, GE India Event, Radiological Society of North America (RSNA) 99th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2014.
45. “Simultaneous Time-of-flight PET-MRI”, GE User’s Meeting, Radiological Society of North America (RSNA) 99th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2014.
46. “Simultaneous Time-of-flight PET-MRI”, FAIR Invited Lecture, University of California – San Francisco (UCSF), 2/2015.
47. “Arterial Spin Label MR Imaging”, University of Pittsburgh Medical Center, Invited Lecture, 3/2015.
48. “Applications of Perfusion MRI in the Brain”, ISMRM Annual Meeting Educational Course, Toronto, Canada, 5/2015.
49. “Incidental Findings – the Neuroradiologist’s Perspective”, International Society of Magnetic Resonance Imaging in Medicine (ISMRM) Annual Meeting, Toronto, Canada, 6/2015.
50. “Applications of Perfusion MR in the Brain”, Society of Magnetic Resonance Technologists Annual Meeting, Toronto, Canada, 6/2015.
51. “PET/MRI Future Directions – Neurology”, Society of Nuclear Medicine and Molecular Imaging (SNMMI) Annual Meeting, Baltimore, MD, 6/2015.
52. “Advanced MRI Methods for Evaluating Cerebrovascular Disease”, invited lecture, Max Planck Institute for Human Cognitive and Brain Science, Leipzig, Germany, 9/2015.

53. “Advanced MRI Methods for Evaluating Cerebrovascular Disease”, invited lecture, Charité University Hospital, Benjamin Franklin Campus, Berlin, Germany, 10/2015.
54. “PET/MRI in Neurological Disease: the Stanford Experience”, invited lecture, Klinik und Poliklinik für Nuklearmedizin, University of Leipzig, Leipzig, Germany, 11/2015.
55. “Perfusion Imaging in Patients with Cerebrovascular Disease”, invited lecture, Fraunhofer Institut MEVIS, Bremen, Germany, 11/2015.
56. “PET/MRI in Neurological Disease,” GE PET/MRI Users’ Meeting, Uppsala, Sweden, 12/2015.
57. “PET/MRI in Neurological Disease,” Stanford PET/MRI Seminar, Stanford, CA, 3/2016.
58. “Best Practices: Research and Clinical Incidental Findings,” American Society of Neuroradiology (SNR) 54th Annual Meeting, Washington, DC, 5/2016.
59. “An Introduction to PET/MRI for Neuroimagers,” American Society of Neuroradiology (SNR) 54th Annual Meeting, Washington, DC, 5/2016.
60. “Dementia and PET/MR,” American Society of Neuroradiology (ASNR) 54th Annual Meeting How-To Session, Washington, DC, 5/2016.
61. “PET/MRI: Engineering, Techniques, and Applications,” Society of Nuclear Medicine and Molecular Imaging (SNMMI), San Diego, CA, 6/2016.
62. “Neuro MRI Web Seminar – ASL, Reduced-FOV DWI, and PET/MRI,” sponsored GE Healthcare Asia, 6/2016.
63. “Imaging of Perfusion and Oxygenation,” Sunnybrook Health Science Centre, University of Toronto Visiting Professorship, Toronto, Canada, 10/2016.
64. “PET/MRI of Neurological Disease,” Sunnybrook Health Science Centre, University of Toronto Visiting Professorship, Toronto, Canada, 10/2016.
65. “Advanced Imaging of Stroke,” Toronto Western Hospital, University of Toronto Visiting Professorship, Toronto, Canada,10/2016.
66. “Arterial Spin Labeling: a Non-PC Alternative to Flow Assessment,” International Society of Magnetic Resonance in Medicine (ISMRM) Flow Workshop, San Francisco, CA 10/2016
67. “ASL Imaging of Collateral Flow”, 3rd International Symposium on Collaterals to the Brain, Los Angeles, CA 11/2016
68. “PET/MRI of the Brain”, Radiological Society of North America (RSNA) 101st Scientific Assembly and Annual Meeting, Chicago, IL, 12/2016.
69. “Simultaneous PET/MRI in Epilepsy”, Stanford Epilepsy Conference, Stanford, CA, 2/2017.
70. “Identifying and Characterizing Arteriovenous Shunting Lesions with Arterial Spin Labeling”, ISMRM Annual Meeting Educational Course, Honolulu, HI, 4/2017.
    - *Awarded Outstanding Teacher Award, ISMRM 2017*
71. “Advanced Stroke Imaging,” Tripler Army Hospital, Honolulu, HI, 4/2017.
72. “Clinical Perfusion Imaging,” St. Paraskeva's Medical Center, Lviv, Ukraine 8/2017.
73. “PET/MRI of the Brain,” St. Paraskeva's Medical Center, Lviv, Ukraine 8/2017.
74. “Advanced Imaging of Stroke,” St. Paraskeva's Medical Center, Lviv, Ukraine 8/2017.
75. “Deep Learning for Radiologists,” St. Paraskeva's Medical Center, Lviv, Ukraine 8/2017.
76. “Using Deep Learning to Improve the Quality of Medical Imaging,” American Society of Functional Neuroradiology (ASFNR), Portland, OR, 10/2017.
77. “PET/MRI: Neurovascular Applications,” ISMRM Workshop on PET/MRI, Chicago, IL, 10/2017.
78. “PET/MRI of the Brain”, Radiological Society of North America (RSNA) 102nd Scientific Assembly and Annual Meeting, Chicago, IL, 12/2017.
79. “The Deep Learning Revolution,” Grand Rounds, Visiting Professor, University of Wisconsin, Madison, WI, 2/2018.

80. “Deep Learning Hands-on Demo,” with Peter Chang, MD, ISMRM Workshop on Machine Learning, Asilomar Conference Grounds, Pacific Grove, CA, 3/2018.
81. “The Deep Learning Revolution: Implications for Radiologists,” Tsinghua University, Beijing, China, 3/2018.
82. “Deep Learning for Neuroradiologists,” Tiantin Hospital, Beijing, China, 3/2018.
83. “Advanced Stroke Imaging,” Tiantin Hospital, Beijing, China, 3/2018.
84. “Perfusion: Clinical Perspective,” ISMRM Workshop on Advanced Neuroimaging, Seoul, Korea, 3/2018.
85. “Deep Learning for Neuroimaging,” New York University, New York, NY, 5/2018.
86. “Deep Learning and AI are Making Clinical Neuroimaging Faster, Safer, and Smarter,” O’Reilly AI Conference, New York, NY, 5/2018.
87. “Clinical Perfusion Neuroimaging,” Seoul National University Hospital, Seoul, Korea, 5/2018.
88. “AI in Neuroradiology,” Keynote Speaker, Guerbet Dotarem Symposium, Seoul, Korea 5/2018.
89. “TIA Imaging and Beyond,” American Society of Neuroradiology (ASNR), Vancouver, BC, Canada, 6/2018.
90. “PET/MRI for Cerebrovascular Disease,” American Society of Neuroradiology (ASNR), Vancouver, BC, Canada, 6/2018.
91. “Adding Value to MR imaging using AI,” GE Lunchtime Symposium, International Society of Magnetic Resonance in Medicine (ISMRM), Paris, France, 6/2018.
92. “How Machine Learning Will Change Clinical Radiology and Nuclear Medicine,” Society of Nuclear Medicine and Molecular Imaging (SNMMI) Categorial Session, Philadelphia, PA, 6/2018.
93. “Predicting Images with Artificial Intelligence,” American Society of Functional Neuroradiology (ASFNR), San Diego, CA, 10/2018.
94. “Image Transformation with AI,” Hot Topics Speaker, Integrative Biomedical Imaging Informatics at Stanford (IBIIS) Retreat, Stanford, CA, 10/2018.
95. “Advances in ASL and their Application to Stroke,” Invited Speaker, STAR Seminar, Chinese Congress of Radiology, Beijing, China, 11/2018.
96. “Image Transformation with AI: a Brave New World for Radiology,” Tiantin Hospital, Beijing, China, 11/2018.
97. “Machine Learning and Artificial Intelligence: Resource or Replacement for Radiologists?”, AJR Live Webinar Series, 1/16/2019.
98. “How Machine Learning will Change Clinical Radiology and Nuclear Medicine”, Society of Nuclear Medicine and Molecular Imaging (SNMMI) Mid-winter Meeting, Palm Springs, CA, 1/2019.
99. “ASL and Artificial Intelligence”, Workshop on Arterial Spin Labeling, Ann Arbor, MI, 3/2019.
100. “Image Transformation with Deep Learning,” Grand Rounds – Robin C. Watson Memorial Lecture, Memorial Sloan Kettering Cancer Center, New York, 5/2019.
101. “Can AI Enable a 10 minute MRI Investigation?”, ISMRM Value Workshop, Edinburgh, UK, 3/2019.
102. “Towards a Scalable AI Research Infrastructure”, American Society of Neuroradiology (ASNR), Boston, MA, 5/2019.
103. “Improving Imaging Efficiency and Safety with AI”, American Society of Neuroradiology (ASNR), Boston, MA, 5/2019.
104. “A Clinician’s View on Deep Learning QSM”, International Society of Magnetic Resonance in Medicine (ISMRM), Montreal, Canada, 5/2019.

105. “Clinical Applications of AI Towards Personalized Medicine”, Society of Nuclear Medicine and Molecular Imaging (SNMMI), Anaheim, CA, 6/2019.

106. “AI is Transforming Medical Imaging”, AI4All Summer Program, Stanford, 6/2019.

107. “Deep Learning Applications for Neuro PET/MRI”, GE SNMMI Summit, Anaheim, CA, 6/2019.

108. “Multimodal Estimation of Cerebral Blood Flow”, GE Signa Masters Summit, San Diego, CA, 8/2019.

109. “AI for Functional Neuroimaging”, American Society of Functional Neuroradiology (ASFNR), San Francisco, CA, 11/2019.

110. “Upstream AI: Using Deep Learning to Improve Image Acquisition, Quality, and Safety”, Radiological Society of North America (RSNA) 104th Scientific Assembly and Annual Meeting, Chicago, IL, 12/2019.

111. “AI-based Image Transformation and its Impact on Radiology”, Deep Learning and Medical Imaging Workshop, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, CA 1/2020

112. “AI and its Impact on Medical Imaging”, Mind Brain 2020 Conference, Hamamatsu, Japan, 2/2020.

113. “The Effect of Artificial Intelligence on Radiology and Nuclear Medicine”, SNMMI AI Webinar Series, 4/2020.

114. “Arterial Spin Labeling MRI’, Rhode Island Hospital, Brown University, 5/2020.

115. “Low and Zero-dose MR Contrast Imaging using Artificial Intelligence,” Stanford Neuro-immunology Lecture Series, 6/2020.

116. “AI is Transforming Medical Imaging”, AI4All Summer Program, Stanford, 7/2020.

117. “Killer Applications: Where Will Machine Learning Make a Substantial Clinical Impact?”, International Society of Magnetic Resonance in Medicine (ISMRM) Educational Symposium, virtual, 8/2020.

118. “AI meets ASL - Is AI the Future of ASL?”, ASL Network Dinner, ISMRM, virtual, 8/2020.

119. “Killer Applications: Where will AI Make a Substantial Impact in Radiology?”, Grand Rounds, University of Connecticut Health, 8/2020.

120. “Transforming Radiology with AI,” UCSF Veteran’s Administration Advanced Imaging Research Center (VAARC) Speaker Series, 9/2020.

121. “How will AI Transform Radiology?”, Keynote Address, University of Utah Department of Radiology Imaging Elevated 2020, 10/2020.

122. “AI-based Image Acquisition Strategies and Dose Reduction Protocols”, Texas Children’s Hospital AI Symposium, 11/2020.

123. “Upstream AI: Strategies for Image Reconstruction, Dose Reduction, and Predicting the Future”, Brainmap Seminar, Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, 11/2020

124. “AI in MRI and PET Image Acquisition and Reconstruction”, Artificial Intelligence Conference, British Institute of Radiology (BIR) / Indian Radiology and Imaging Association (IRIA), 11/2020

125. “Artificial Intelligence – Decision Support: the Coronavirus Experience in the USA”, Hot Topics Session, RSNA 2020, 12/2020

126. “AI for MRI Acquisition and Reconstruction”, RSNA Refresher Course Informatics, RSNA 2020, 12/2020

127. “Molecular Neuroimaging: Cerebrovascular Disease”, RSNA Refresher Course Informatics, RSNA 2020, 12/2020

128. “Artificial Intelligence in Neuroradiology: Current Status and Future Directions”, Asia Oceanian Congress of Neurology 2021, 3/2021

129. “The Impact of Deep Learning on Radiology”, At the Interface of Brain and Machine, organized by Nature Portfolio, 4/2021

130. “Artificial Intelligence in Stroke Imaging”, Asian-Oceanian Congress of Neuroradiology 2021, 4/2021

131. “Starting your Perfusion Service: When and How to Implement DSC, ASL and IVIM,” American Society of Neuroradiology (ASNR) 2021, virtual, 5/2021

132. “AI in Vascular MRI,” Society of Magnetic Resonance Angiography (SMRA) 2021, virtual, 9/2021.

133. “Artificial Intelligence Applications for Contrast-enhanced Imaging,” European Society of Neuroradiology (ESNR) 2021, virtual, 10/2021.

134. “Supercharging MRI with Deep Learning”, RSNA 2021, Chicago, IL, 11/2021.

135. “AI-enhanced Neuroimaging”, RSNA 2021, Chicago, IL, 11/2021.

136. “Amyloid-related Imaging Abnormalities (ARIA)”, RSNA 2021 (Biogen seminar), Chicago, IL, 11/2021.

137. “AI to Reduce Study Duration and Radiation Dose in Pediatric Imaging,” AIMed conference, 11/2021.

138. “Future Trends in Stroke Imaging: Clinical Treatments and New Methods,” Swiss Federation of Clinical Neuro-societies (SFCNS) Congress, Basel, Switzerland, 11/2021.

139. “AI-enhanced Neuroimaging,” AI + Health Conference, Stanford, CA, 12/2021.

140. “AI for Spine Imaging,” (moderator), American Society of Spine Radiology (ASSR), virtual webinar, 1/2022.

141. “Artificial Intelligence in Clinical Practice,” Association of University Radiologists (AUR) Annual Meeting, Phoenix, AZ, 3/2022.

142. “Artificial Intelligence in Neuroimaging,” Society of Nuclear Medicine and Molecular Imaging (SNMMI) High Country Meeting, Sun Valley, ID, 3/2022.

143. “Deep Learning-based Improvement of PET Neuroimaging,” Annual Meeting of the American Society of Neuroradiology (ASNR), New York, NY, 5/2022.

144. “MR Contrast Imaging: Future and Impact of AI,” Annual Meeting of the International Society of Magnetic Resonance in Medicine (ISMRM), London, UK, 5/2022.

145. “AI is Transforming Medical Imaging,” AI4All class, Stanford, CA, 7/2022.

146. “How Artificial Intelligence Will Fundamentally Change the Practice of Radiology,” Global Center for Biomedical Sciences and Engineering (GCB) Symposium, Hokkaido, Japan, 8/2022.

147. “Current and Future Ischemic Stroke Imaging: How Physicists and Biomedical Engineers can Improve the Care of Stroke Patients,” GCB Summer School, Hokkaido, Japan, 8/2022.

148. “PET/MRI Approach to Dementia Imaging: Update on Alzheimer’s Treatment Trials and Amyloid-related Imaging Abnormalities (ARIA),” ASFNR Symposium, Maui, HI, 8/2022.

149. “Brain Perfusion: ASL Primetime?,” Annual Meeting of the European Society of Neuroradiology (ESNR), Lisbon, Portugal, 9/2022.

150. “Artificial Intelligence in Neuroimaging,” Annual Meeting of the European Society of Neuroradiology (ESNR), Lisbon, Portugal, 9/2022.

151. “AI for Image Acquisition,” Invited Lecture, University of Pittsburgh Medical Center (UPMC), virtual, 9/2022.

152. “Supercharging MRI with Deep Learning,” RSNA 2022, Chicago, IL, 11/2022.

153. “Future of Radiology: AI,” CPEP Symposium @ RSNA, Chicago, IL, 12/2022.

154. “AI in Neurodegeneration - Diagnosis and Prediction,” Society of Nuclear Medicine Mid-winter Meeting, San Francisco, CA, 1/2023.

155. “Where Is AI/ML Taking Stroke Diagnosis and Care? AI and Imaging,” American Heart Association International Stroke Conference, Dallas, TX, 2/2023.

156. “Amyloid-related Imaging Abnormalities (ARIA) – ARIA E,” American College of Radiology Webinar (virtual), 3/2023.

157. “AI and Neuroimaging,” St. Jude Children’s Research Hospital, Zoltan Patay Scientific Symposium, Memphis, TN, 4/2023.

158. “Synthetic MRI Innovations and Ultra-low Gadolinium with Machine Learning,” Annual Meeting of the American Society of Neuroradiology (ASNR), Chicago, IL, 5/2023.

159. “Comparison of ASL and DSC Perfusion Imaging,” Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM), Toronto, Canada, 6/2023.

160. “Applications of AI in the Clinic: Predicting Phenotypes, Prognosis, and Outcomes,” Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM), Toronto, Canada, 6/2023.

161. “AI/ML Clinical Translation and Impact,” Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM), Toronto, Canada, 6/2023.

162. “Value of AI for Medical Imaging,” Ukrainian Medical Association of North Americas’ Scientific Conference, Nashville, TN, 6/2023.

163. “Artificial Intelligence in Radiology,” International Neuroimaging Symposium, Split, Croatia, 6/2023.

164. “AI and the Future of Radiology,” Keynote address, Silicon Valley Future Academy, Stanford, CA, 9/2023.

165. “Improving PET/MRI for Neurodegenerative Disease”, Annual Meeting of the American Society of Functional Neuroradiology, Boston, MA, 10/2023.

166. “Spine Imaging in the Age of AI,” Annual Meeting of the Western Neuroradiological Society, Scottsdale, AZ, 10/2023.

167. “Anti-amyloid Therapies and ARIA: the Radiologist’s Role”, Radiological Society of North America (RSNA), Chicago, IL, 11/2023.

168. “Paradigm Shifts in Stroke Imaging”, Neuro Imaging 2024, Advanced Imaging Multimodality Seminars (AIMS), Tokyo, Japan, 1/2024.

169. “How to Deploy AI Solutions at Scale in Radiology Business”, Radiology Business Management Association, AI Webinar Series, 3/2024.

170. “Amyloid-related Imaging: a Case-based Approach” American College of Radiology (ACR) Webinar 5/2024.

171. “Deep Learning Image Synthesis,” Annual Meeting of the American Society of Neuroradiology (ASNR), Las Vegas, NV, 5/2024.

172. “Collaborating with Industry as an Academic,” ASNR-ASFNR AI Workshop, Las Vegas, NV 5/2024.

173. “PET/MRI > PET + MRI: How to Use Both Modalities to Improve Patient Care,” XXVIII Annual Symposium & Training, Advanced Imaging Research Center, UT Southwestern Medical Center, Dallas, TX, 6/2024.

174. “ARIA Evaluation for AD: Case Review”, American Society of Functional Neuroradiology, Aspen, CO, 8/2024.

175. “The Future of Clinical Adoption for Radiology AI”, Keynote address, ML-CDS Workshop, MICCAI 2024, Marrakech, Morocco, 10/2024

176. “Perspectives on the Future of Medical Imaging”, Keynote address, The International Biomedical and Astronomical Signal Processing (BASP) Frontiers Conference, Villars-sur-Ollon, Switzerland 1/2025.

177. “Perspectives on the Future of Medical Imaging”, Grand Rounds, Distinguished Lecturer, Department of Radiology, Emory University School of Medicine, Atlanta, GA, 2/2025.

178. “AI Imaging for Stroke Care”, Research in Progress Seminar, Distinguished Lecturer, Department of Radiology, Emory University School of Medicine, Atlanta, GA, 2/2025.

179. “AI and the Future of Medical Imaging”, University of Washington EECS Seminar, 3/2025.

180. “AI for MR Contrast Agent Imaging” (Podcast) – Northwest Imaging Forums, recorded 4/2025.

181. “Career Pivots”, AJR Podcast, 5/2025.

182. “Building a Team: Success Stories”, International Society of Magnetic Resonance in Medicine (ISMRM), Honolulu, HI, 5/2025.

183. “Alzheimer’s Therapies: the Radiologists’ Role”, American College of Radiology Neuroradiology Commision webinar, 1/2026.

Research Support

ACTIVE:

R01- NS130172 (PI: Greg Zaharchuk) 08/15/23-07/31/28 2.4 calendar
NIH $2,922,321
“Predicting Tissue and Functional Outcome in Acute Stroke”
We will apply deep learning artificial intelligence methods to integrate imaging and clinical information to predict short-term tissue and long-term clinical outcome under the conditions of successful and unsuccessful reperfusion and perform studies to understand the generalizability and explainability of the AI methods.

R56-AG071558 (PI: Greg Zaharchuk) 09/01/22-08/31/24 2.4 calendar
NIH $1,554,659
“AI-Enhanced Brain PET Imaging for Alzheimer’s Disease”
The goal of this project is to develop ultra-low dose imaging protocols and algorithms for amyloid and tau brain PET imaging, as well as to reduce overall time and patient burden for acquiring multiple biophysical and molecular imaging contrasts in patient with cognitive decline.

R01-NS123025 (PI: Greg Zaharchuk) 09/01/21-08/31/26 2.4 calendar
NIH $2,733,214
“Next Generation Brain PET Imaging”
The goal of this project is to develop deep convolutional neural network approaches to FDG PET imaging, the most commonly performed clinical brain-focused PET study in the USA. Using simultaneous PET/MRI, we will train networks to produce diagnostic PET images from MRI and ultra-low dose PET/MR images.

U01-AG082350 (PI: Johnson, Mormino) 9/01/23-8/31/28 1.2 calendar
NIH $30,800,018
“ADRC Consortium for Clarity in ADRD Research Through Imaging: CLARITI”
Multiple etiologies variously contribute to the clinical syndrome of mild cognitive impairment and dementia presumed due to Alzheimer’s disease, but the many factors that give rise to symptoms are difficult to quantify at the level of the individual. A comprehensive panel of imaging and plasma biomarkers will improve the likelihood that etiologies beyond Alzheimer’s disease can be detected. Such individual-level characterization will greatly impact diagnostic accuracy, and prediction of symptom course and response to experimental therapies.
Role: Co-investigator

P30-AG066515-01 (PI: Victor Henderson) 6/1/20–5/30/25 0.84 calendar
NIH/NIA

"Stanford Alzheimer's Disease Research Center (ADRC)"
The Stanford ADRC serves as a shared resource to facilitate and enhance research on Alzheimer's disease, cognitive impairment associated with Lewy body pathology, and related disorders. The center provides resources in support of human studies; autopsy tissues, biospecimens, and biomarker data; structural, functional, and molecular brain imaging; biostatistical consultation; professional training; and community-based outreach.
Role: Co-investigator`

R21-EB032485 (PI: Audrey Fan, UC Davis) 9/30/22-8/31/25 0.6 calendar
NIH-NIBIB
"Imaging of human brain oxygenation and oxygen metabolism dynamics"
This project develops novel, clinically feasible tools for non-invasive oxygenation imaging, to study how the brain dynamically meets its oxygen needs and identify key pathophysiology in neurological patients.
Role: Subaward PI

COMPLETED:

R01-EB025220 (PI: Greg Zaharchuk) 10/1/18-5/30/23 2.4 calendar
NIH $2,769,867
"*Cerebrovascular Reserve Imaging with Simultaneous PET/MRI Using Arterial Spin Labeling and Deep Learning"*
The goal of this project is to improve the quality of arterial spin label (ASL) MRI using deep learning, a powerful form of machine learning, that is currently undergoing tremendous progress. We will then apply this in a prospective, adaptive validation trial against oxygen-15 water PET CBF, using simultaneous PET/MRI to minimize biological variability.

R01-EB025220 - 03W1 (PI: Greg Zaharchuk) 9/1/20-5/30/23 0.60 calendar
NIH NIA $307,236
"Predicting PET Cerebral Blood Flow from MRI using Deep Learning in Dementia; Supplement"
The goal of this supplement is to evaluate the generalizability/bias of AI methods for predicting oxygen-15 water PET cerebral blood flow (CBF) in a wider range of patients, particularly those with memory concerns. We will evaluate the performance of deep learning in patients with Alzheimer's disease, mild cognitive impairment, and subjective memory concerns who are undergoing amyloid PET/MRI.

R01-EB031038 (PI: Craig Levin) 5/3/22-1/31/26 0.60 calendar
NIH-NIBIB
"Translation and Validation of a Radiofrequency-Penetrable PET insert for Simultaneous PET/MRI imaging of Neurological Disorders"
This project supports the development of PET insert technology for MRI scanners.
Role: Co-investigator

SPO# 116574 (PI: Garry Gold**)** 9/4/14-8/31/18 0.60 calendar
General Electric Healthcare $929,926
"PET-MRI Advanced Research and Development Project"
The goal of this multi-year project is to work collaboratively with GE Healthcare scientists to enable research and technical development of simultaneous time-of-flight PET-MRI in humans for body, neurological, and pain imaging. I am the PI of the neuro team, and our goal is to demonstrate the research and clinical value of this new hybrid imaging device.

SPO# 44702 (PI: Brian Hargreaves) 04/01/14-03/31/20 1.80 calendar
General Electric Healthcare (Tiger Team)
"Magnetic Resonance Imaging (MRI) Systems"
This industry supported research program fosters the advancement of MRI techniques for rapid translation and clinical applications.

SPO# 226560 (PI: Greg Zaharchuk) 06/01/21-05/31/22 0.12 calendar
University of Washington
"AI-based Neuroimaging"
This project enables collaboration and sharing of datasets between Stanford and the University of Washington for the purposes of deep learning enhanced MRI and PET imaging.

5R01-NS066506 (PI: Greg Zaharchuk) 08/05/09-05/31/19 2.4 calendar
NIH $4,888,395
"Imaging Collaterals in Acute Stroke"
This multi-center project will evaluate the performance of ASL imaging of both quantitative CBF and collateral flow in a large group of acute stroke patients, and to compare with more conventional measures of perfusion, such as bolus dynamic susceptibility contrast. The overall goal of the imaging the Collaterals in Acute Stroke (iCAS) study, is to identify and quantify cerebral blood flow (CBF) delivered via collateral routes using arterial spin labeling (ASL), a non-contrast MRI technique, and to determine its impact on ischemic lesion growth and patient outcome.

1R21-NS087491 (PI: Greg Zaharchuk) 04/01/14-03/31/17 0.60 calendar
NIH $150,000
"Oxygenation Fingerprinting with MRI for Ischemic Stroke"
The goal of this project is to develop and test novel MR-based methods of measuring brain oxygenation focusing on the use of vascular fingerprinting, and to apply these techniques in acute stroke.

1R01-NS066506 (PI: Greg Zaharchuk) 08/05/09-07/30/13
NIH, Principal Investigator
"Quantifying Collateral Perfusion in Cerebrovascular Disease"
The overall goal of this submission is to identify and quantify cerebral blood flow (CBF) delivered via collateral routes using arterial spin labeling (ASL), a non-contrast MRI technique that combines aspects of perfusion and angiography. DSA and xenon CT (xeCT) will act as gold standards for collaterals and CBF, respectively.

1R01-DK092241 (PI: Manjula Tamura) 05/01/12-04/30/17 1.80 calendar
NIH $397,646
"MIND the Kidneys"
Chronic kidney disease (CKD) affects 12% of the United States adult population and it doubles the risks for stroke and dementia. While brain small vessel ischemic disease is linked with both stroke and dementia in the general population, almost nothing is known about the risk factors for small vessel ischemic disease or the relation of small vessel ischemic disease to clinical outcomes in patients with CKD. Our overarching goal is to characterize the physiological mechanisms that underlie the relationship between CKD, hypertension, and blood pressure reduction.

1R01-EB002711 (PI: Roland Bammer) 09/19/03-05/31/16 0.37 calendar
NIH $329,573
"Advanced MR and CT Imaging for Understanding Acute Stroke Evolution and Predicting Response to Recanalization Therapy"
This project aims to compare for the first time the diagnostic ability of CT and MR to reliably identify irreversibly damaged tissue, at-risk (but potentially salvageable) tissue, and the "leakiness" of injured vessels in acute stroke patients. It will also assess each modality's ability to identify patients who will respond favorably to clot lysis/retrieval (a.k.a., reperfusion therapy) as well as those patients who would not benefit or who might actually sustain harm from the complications of reperfusion.

Scully Family Grant (PI: Greg Zaharchuk) 05/01/18-4/30/20 0.60 calendar

Stanford Alzheimer's Disease Research Center $300,000
"Extreme Radiation Dose Reduction for PET Imaging of Alzheimer's Disease using Deep Learning"
The goal of this proposal is to test the ability of deep learning image improvement algorithms to reduce radiation dose for PET amyloid imaging by a factor of 100, and to use this capability to perform single session dual radiotracer studies of amyloid and tau.

Human-centered AI Seed Grant (PI: Greg Zaharchuk) 07/01/18-6/30/20 0.60 calendar
Stanford Artificial Intelligence Laboratory (SAIL) $46,296
"Using Deep Learning for Imaging Alzheimer's Disease with Simultaneous Ultra-low-dose PET/MRI"
Alzheimer's Disease (AD) is a devastating neurodegenerative disorder and a major public health crisis, currently affecting over 5 million Americans. With the advent of AI-based methodologies such as convolutional neural networks and simultaneously-acquired multimodal magnetic resonance imaging (MRI) and PET scanning, we hypothesize that we can generate high-SNR, diagnostic PET images from PET/MRI scan protocols with ultra-low injected radiotracer dose and/or reduced imaging time.

Stanford Internal Grant (PI: Greg Zaharchuk) 07/01/19-6/30/20 0.06 calendar
Artificial Intelligence in Medicine and Imaging (AIMI) $75,000
"Artery Occlusion Detection on Digital Subtraction Angiography in Acute Ischemic Stroke Patients"
Precise DSA reading requires long-term training in neurointervention, but it is very challenging for non-neurointerventionalists in the stroke team to interpret DSA. We will develop an automated tool that facilitates the diagnosis of artery occlusion in real-time using deep learning that will assist clinical decision-making and improve the quality of care.

SPO# 134090 (PI: Greg Zaharchuk) 04/01/18-3/31/20 0.12 calendar
Bayer Healthcare Pharmaceuticals $238,622
"Reduced Contrast Dose Imaging with Deep Learning"
The hypothesis of this study is that a deep learning network can be trained to synthesize diagnostic quality contrast-enhanced brain MR images from original images obtained with significantly reduced contrast dose. The primary endpoint is to demonstrate equivalence of low dose and normal dose post-contrast T1-weighted images for neuroimaging.

SPO# 130526 (PI: Greg Zaharchuk) 04/01/17-3/31/19 0.12 calendar
GE Healthcare $200,000
"Technical MRI Improvements in Rapid Imaging with MR Fingerprinting"
We seek to find methods that reduce the MR fingerprinting search space to a manageable problem, while increasing the efficiency of synthetic MR by exploiting the mutual information in the overall data set.

General Electric Healthcare (PI: Greg Zaharchuk) 01/01/14-06/30/14
Industry, Principal Investigator
"Comparison of 18F FDG PET/CT to PET/MR"

This industry supported research program supports the development of PET-MRI techniques for rapid translation and clinical applications.

1K99-NS102884-01 (PI: Audrey Fan, PhD) 04/15/18-03/31/2020
NIH $170,461
"Quantitative PET/MRI of Brain Oxygenation in Cerebrovascular Disease"
This project develops a clinically feasible toolset to noninvasively image brain tissue oxygenation by magnetic resonance imaging (MRI), a critical unmet need in stroke to stratify patients for new interventions. This work aims to develop novel MRI methods based on quantitative BOLD and vascular fingerprinting to quantify brain tissue oxygenation and validates these measurements with simultaneous [15O] PET observations on a hybrid PET/MRI scanner. Our study will provide

new insights about oxygenation status in patients with carotid artery stenosis to better understand its pathophysiology, and determine which patients are good candidates for new revascularization procedures to prevent stroke.

U01-NS092076 (PI: Gregory Albers) 04/01/16-06/01/20 0.60 calendar
NIH
"Endovascular Therapy Following Imaging Evaluation for Ischemic Stroke 3 (DEFUSE 3)"
This is a study to evaluate the hypothesis that FDA cleared thrombectomy devices plus medical management leads to superior clinical outcomes in acute ischemic stroke patients at 90 days when compared to medical management alone in appropriately selected subjects with the Target mismatch profile and an MCA (M1 segment) or ICA occlusion who can be randomized and have endovascular treatment initiated between 6-16 hours after last seen well.

2R01-NS047607 (PI: Michael E. Moseley) 02/01/04-07/31/15
NIH $445,617
"Microvascular Measures of Perfusion in Stroke Recanalization"
The overall goal of this project is to identify and improve cerebral blood flow (CBF) techniques from dynamic susceptibility contrast (DSC) perfusion-weighted MRI (PWI) methods that can depict both restoration of flow together with the microvascular status that would optimally compare with DWI to form a clinically useful DWI-PWI mismatch representing brain tissue-at-risk or salvageable brain.

Scholar Award (PI: Greg Zaharchuk) 7/01/09-06/30/11
ASNR Neuroradiology Education and Research Foundation, Principal Investigator
"Optimizing Arterial Spin Label MRI for the Visualization of Collateral Flow in Moyamoya Disease"
The goal of this study is to better characterize and understand the relationship between reduced perfusion and delayed arterial arrival time in patients with Moyamoya disease, a severe vasculopathy of young patients with unknown etiology.

1R01-NS075209 (PI: Maarten Lansberg) 09/01/11-02/29/16
NIH $396,784
"CTP to Predict Response to Recanalization in Ischemic Stroke Project (CRISP)"
The goal of this project is to assess whether CT perfusion imaging can be used to triage acute ischemic stroke using methodology refined from multiple MR perfusion based imaging trials.

R01-NS039325 (PI: Gregory Albers) 09/30/09 - 08/31/12
NIH, Co-investigator
"Diffusion-weighted imaging Evaluation For Understanding Stroke Evolution 2: DEFUSE 2"
The aim of this study is to determine if MRI can help identify which patients, who are ineligible for iv tPA therapy or have failed iv tPA therapy, should undergo an endovascular clot removal procedure.

GE Healthcare (PI: Robert Herfkens) 01/01/12 - 12/31/12
Industry, Co-investigator
"PET-MR, Disease Based Patient Workflow and System"
The goal of this study was to evaluate potential workflow solutions for simultaneous PET-MRI scanning in anticipation of the delivery of a dedicated TOF PET-MRI whole-body scanner.

NIH-R43 (PI: Sandy Napel, MD & Kitware, Inc.) 6/01/09-5/31/10
NIH, Co-investigator
"Automated Bone Removal for Head and Neck CTA using Dual Energy CT"
The goal of this SBIR is to develop techniques that utilize dual energy CT to improve segmentation algorithms for head and neck CT angiography, particularly in challenging regions such as the vertebral arteries and petrous and cavernous internal carotid arteries.