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Education

Bachelor of Engineering (Honours Electrical) with distinction, McGill University, Montreal, Canada, 1971

M.D., C.M., McGill University, Montreal, 1975

Straight Internship and Resident II, Medicine, Royal Victoria Hospital, McGill University, Montreal, 1975-77

Resident and Fellow in Neurology, McGill University Program, 1977-80; and Chief Resident, Neurology, Montreal Neurological Hospital, July-Sept, 1979

Clinical and Academic Appointments

1981-1982	Lecturer, Dept of Neurology and Neurosurgery, McGill University, Montreal, Canada, and Assistant Neurologist, Montreal Neurological Hospital (on leave of absence)
1981-1986	Assistant Neurologist, Barnes Hospital, St. Louis, MO
1981-1983	Research Instructor and Instructor in Neurology, Dept of Neurology and Neurosurgery, Washington University School of Medicine, St. Louis
1983	Instructor, Division of Radiation Sciences, Dept of Radiology, Washington University School of Medicine, St. Louis
1983-1986	Assistant Professor of Neurology, Dept of Neurology and Neurosurgery, and Assistant Professor of Radiation Sciences, Dept of Radiology, Washington University School of Medicine, St. Louis
1983-1986	Instructor, Program in Occupational Therapy, Washington University School of Medicine, St. Louis
1984-1986	Consulting Neurologist, Jewish Hospital of St. Louis

1987-present	Chief, Positron Emission Tomography Imaging Section, Nuclear Medicine Department / PET Department, National Institutes of Health, Bethesda, MD Senior Attending Physician, National Institutes of Health Clinical Center
1989-1991	Acting Chief, Radiochemistry/Cyclotron Section, Department of Nuclear Medicine, NIH
2003-2005	Acting Director, PET Department, NIH Clinical Center
2005–present	Director, PET Department, NIH Clinical Center

Medical Licenses and Certification

Licentiate, Medical Council of Canada (LMCC), July 1976

Diplomate, National Board of Medical Examiners, USA, April 1977

Medical Licenses:
Province of Quebec, June 1976
State of Missouri, February 1981

Board Certification, Neurology:
Royal College of Physicians and Surgeons, Canada, November, 1980
Professional Corporation of Physicians, Quebec, December, 1980

NIH Authorized User of Radioactive Materials in Human Subjects, 1988

Awards

McGill University Entrance Scholarship, 1966-67; McGill University Scholarships, 1967-68, 1971-72, 1972-73, 1973-74, 1974-75; Frederick Smith Memorial Scholar, Faculty of Medicine, McGill University 1973-74

Member, McGill University delegation, Voyage d'observation et d'information, France, May-June, 1970

Scarlet Key Honour Society, McGill University

Hackbusch Award, for the best paper submitted from student branches, Institute of Electrical and Electronic Engineers, Canada, 1971

Research Fellowship, Medical Research Council of Canada, 1981, 1982

Listed in Best Doctors in America (Nuclear Medicine) 1992-93, 1994-95, 1998, 2011-12, 2013; Best Doctors in America - Southeast Region (Nuclear Medicine), 1996-97

Fellow, American College of Physicians (FACP)

Fellow, Royal College of Physicians, Canada (FRCPC)

Fellow, Society of Nuclear Medicine and Molecular Imaging (FSNMMI)

Kuhl-Lassen Brain Imaging Award and Lecturer, Society of Nuclear Medicine, June 2000

NIH Clinical Center Director's Award, 2005

NIH Office of the Director Honor Award, 2012

NIAID Merit Award, 2015

Society of Nuclear Medicine and Molecular Imaging, Presidential Distinguished Service Award, 2013 and 2016

Organization for Human Brain Mapping 2013 Editors' Choice Award to K Simonyan, P Herscovitch, B Horowitz

Inclusion in the Journal of Nuclear Medicine's 60th Anniversary issue, 2020, as an author of one of the journal's most influential or cited manuscripts

Professional Associations

International Society for Cerebral Blood Flow and Metabolism:
- President, 2015-2017
- Immediate Past President, 2017-19, President-elect, 2013-2015
- Treasurer, 2008-2013
- Chair, Finance Committee, 2001-2003
- Web Page Committee, 1997-2003
- Membership Committee, 1995-97; Chair, 1997-1999
- Board of Directors, 1995-99

Society of Nuclear Medicine and Molecular Imaging:
- President 2014-15; Immediate Past President, 2015-16
- President-elect 2013-14, Vice President-elect, 2012-13
- Board of Directors, 2007-2010
- Brain Imaging Council:
  - President 2006-2007
  - Vice-president/President-elect 2004-06
  - Board of Directors 1997-99, 2003-05
  - Nominatng Committee, 2023-24
- Molecular Imaging Center of Excellence:
  - Editorial Board, 2007-2012
  - Board of Directors, 2010-2013
- PET Center of Excellence Board of Directors, 2012-15
- Committee on Councils, 2005-07
- Education Committee 2009-2013
- Ethics Committee, 2009-2012

Committee on Outreach and Chair, Brain Working Group 2011-3; member 2013-24
Patient Advocacy Advisory Board, 2011-2015
Grants and Awards Committee, Chair 2016-7; member 2017-24
Committee on Fellows, 2019-25
Nominating Committee Chair 2016-17; member 2006-07

American Academy of Neurology
American College of Physicians
Royal College of Physicians (Canada)
Institute of Electrical and Electronic Engineers
Chair, GE/Scanditronix PET Users' Group, 1991-92

Organization of Scientific Meetings

Society of Nuclear Medicine, Annual Meeting Scientific Program Committee
Scientific Program Committee Chair, 2009-13
Associate Chair, 2005-08
Vice-Chair, Neurosciences, 2002-06
Sub-Chair: PET Instrumentation & Data Analysis, 1990; Neurology, 2001;
Neurosciences Young Investigator Award, 2007, 2008

International Society for Cerebral Blood Flow and Metabolism
Program Committee member, Biennial Meeting Taipei, 1999-2001
Program Committee member, Biennial Meeting Amsterdam, 2003-2005
Program Committee member, Biennial Meeting Berlin, 2015-2017

Co-organizer, 3rd International Symposium on Quantification of Brain Function "Brain PET"97, Bethesda MD, June 1997

Program Committee, Third Theranostics World Congress on Ga-68 and Peptide Receptor Radionuclide Therapy, Baltimore, March 12-14, 2015

Reviewer, Other Scientific Meetings:
Scientific Advisory Board, Biennial International Symposium on CBF and Metabolism, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017
Scientific Advisory Board, BrainPET'93, Akita Japan 1993
Scientific Advisory Board, Human Brain Mapping meeting HBM2007, Chicago
Society of Nuclear Medicine, Annual Meeting (Neurology): 1985, 1989-92, 1995-2000
American Acad of Neurology, Farber Award for Brain Tumor Research Review Cttee, 1993
International Scientific Program Cttee, International Symposium on Functional NeuroReceptor Mapping of the Living Brain: Copenhagen 2006; Pittsburgh 2008; Glasgow 2010; Baltimore 2012; Amsterdam 2014; Boston 2016; London 2018; Montreal 2021 (Local Organizing Cttee); Montreal 2024
World Molecular Imaging Congress, 2009; 2011-17
Radiologic Society of North America (RSNA) Molecular Imaging Subcommittee/Scientific Program Committee, and Education Exhibits Committee, 2011-17

Editorial Boards

Associate Editor, Journal of Cerebral Blood Flow and Metabolism, 2017-present
Editorial Board, Journal of Cerebral Blood Flow and Metabolism, 1992-2000
Editorial Board, Clinical Nuclear Medicine, 2009-2010, 2023-present
Editorial Board, Clinical & Translational Imaging: Reviews in Nuclear Medicine and Molecular Imaging, 2012-18
Editorial Board, American Journal of Nuclear Medicine and Molecular Imaging, 2013- present
Editorial Board, Nuclear Medicine and Molecular Imaging (Korea), 2015-2018

Scientific Review Committees

NIH Review Committees:

NINDS Special Review Committee, Massachusetts General Hospital, Sept 1987, Jan 1989
NIMH Research Scientist Development Review Committee, 1987,1988,1989,1990
NINCDS Special Review Committee, Brookhaven National Laboratories, Dec 1988
NCI Special Review Committee, University of Washington, April 1989
NIH Pathology A Study Section ad hoc member, 1989
NINDS Special Review Committee, University of Pennsylvania, March 1991, Dec 1991
NIMH Functional Imaging Centers Special Review Committee, May 1991
NIMH Special Review Committee, University of Michigan, July 1991
NIH DRG Radiation ad hoc Study Section, June 1992
NIH DRG Special Study Section X, Multidisciplinary Special Emphasis Panel, June 1993
NIA Special Review Committee, University of Southern California, Feb 1994
Human Brain Project P20 Special Review Committee, March 1994
NIA ad hoc Review Committee - CERAD Review, April 1994
NIH DRG Special Study Section 1, Multidisciplinary Special Emphasis Panel, July 1994
NIMH Special Emphasis Panel, Yale University review, March 1996.
NIA Neurosciences Aging Review Committee, March 1997
NINDS Special Emphasis Panel - Parkinson's Disease Centers, July 1998
NINDS Neurological Sciences and Disorders B, ad hoc member, Feb 25, 2000
NINDS Neurological Sciences and Disorders B, ad hoc member, Oct 19, 2000
NIA Special Emphasis Panel – Early Markers of Alzheimer's Disease, Aug 9, 2004
NCI In Vivo Cellular and Molecular Imaging Centers (ICMICS) Study Section, Nov 2005
NIDDK Toward Imaging the Pancreatic Beta Cell Special Emphasis Panel Aug 8 2006
NIMH Conte Center for Mood/Schizophrenia Review Panel, Feb 2007

Other Review Committees

Medical Research Council of Canada *ad hoc* reviewer, 1988, 1989, 1992, 1993, 1997
Dept of Veterans Affairs Medical Research Service, Research Advisory Group, 1991
Medical Research Council of Canada Review Cttee, Clarke Institute of Psychiatry, Toronto, January 1996
Medical Research Council of Canada Neurosciences B Cttee, ad hoc member, Dec 1997
Ontario Mental Health Foundation, 1993
Montreal Neurological Institute Brain Imaging Centre Review Committee, Chair, July 1994
Human Frontier Science Program, 1997
McGill University MNI Tenure and Promotions Cttee, *ad hoc* member, 2002

The Charles R. Dana Foundation: Advisory Cttee for Clinical Hypotheses in Neuroscience Research Program in Imaging, 1999-2003; Advisory Cttee for Immuno-imaging Program, 2001-2002
Cancer Research UK, 2003
Dept of Energy, Office of Biological and Environmental Research, Sept 2004
Scientific Review Committee, Montreal Neurological Institute, McGill University, Aug 27-28 2008
Canada Foundation for Innovation Review Committee (Neuroimaging), November 25 2008
The Alzheimer's Association, 2004, 2005, 2007, 2009
Dept of Veterans Affairs Merit Review Panel, Cellular and Molecular Medicine, November 2011

NIH Intramural Committees

PET Scientific Review (Kety) Committee, NIH Intramural Research Program, 1987-1995
PET Advisory Committee, Intramural Research Program, NIDA, NIH, 1995-97
CC *ad hoc* Committee for Medical Record Design, 1995
Head, NIH Inter-Institute PET Interest Group, 1996-present
Animal Care and Use Committee, NIH Clinical Center, 1993-present; Vice-chair 2019-202; Chair 1996-1998, 2003-2005, 2010-2012, 2020-2022
NIH Animal Research Advisory Committee, 1996-1998, 2003-2005, 2010-2012, 2020-2022
NIH Clinical Center Scientific Advisory Committee, 2004-2005
NIH Imaging Probe Development Center (IPDC) Steering Committee, 2007- 2019, replaced by:
NIH Chemistry and Synthesis Center Steering Cttee, 2020-present
NIH PET Steering Committee, 2005 – present
NIMH PET Committee, 2020-present
NINDS Protocol Scientific Review Committee, 2014 – present

NIMH Search Committee, for Director of Magnetoencephalography Core, 2018
NIBIB Search Committee for PI, PET Radiochemistry Research Laboratory, 2007-08
Chair, Search Committee for Director of Imaging Probe Development Center, NIH IRP, 2013
Chair, Search Committee for Director of Radiology Dept., NIH Clinical Center, 2017

Department of Health and Human Services Committees

FDA Medical Imaging Drugs Advisory Committee (MIDAC), Member, 2015-2025
CMS Medicare Evidence Development & Coverage Advisory Committee, *ad hoc* member, Jan 30, 2013
FDA Peripheral and Central Nervous System Drugs Advisory Committee, *ad hoc* member, January 20, 2011, to consider an NDA for Florbetapir F 18 injection for use in PET imaging of beta-amyloid in the brain
FDA Peripheral and Central Nervous System Drugs Advisory Committee, *ad hoc* member, August 11, 2009, to consider an NDA for I-123 Ioflupane to detect loss of functional nigrostriatal dopaminergic neurons by SPECT imaging
FDA Peripheral and Central Nervous System Drugs Advisory Committee, *ad hoc* member, Oct 23, 2008, to consider radionuclide imaging products for the detection of amyloid to assist in the diagnosis of Alzheimer's Disease
FDA CDER Medical Imaging Drugs Advisory Committee, Guest Expert, June 28-29, 1999

Department of Defense Committees

Joint Human Imaging/Image Processing Steering Committee, Center for Neuroscience & Regenerative Medicine, USUHS, DoD 2009 - 2020
Translational Imaging Facility Steering Committee, Center for Neuroscience & Regenerative Medicine, USUHS, DoD 2009 - 2020
Neuroimaging Steering Committee for The National Intrepid Center of Excellence (NICoE), Bethesda, MD, Dept of Defense, 2010-2011

Consultant and Other Activities

Neurology Consultant, Missouri Patient Care Review Foundation, 1985-86
West Virginia University Center for Nuclear Medicine Research, External Advisory Committee, 1991-93
Consultant, Brain Imaging Center, Nathan Kline Institute, Rockland Psychiatric Center, Orangeburg NY, 1992
External Advisory Committee, Clinical Pathophysiology of Acute Brain Injury Program Project, Washington University School of Medicine, St. Louis, MO, 1997-2005
External Advisory Committee and DSMB, Pilot Collaborative PET Imaging Trial in Frontotemporal Dementia, University of Michigan, 2003-2006

Teaching

Program in Occupational Therapy, Washington University School of Medicine: Medical Neurology 319C, 1983-86
Foundation for Advanced Education in the Sciences (FAES) Graduate School at the NIH: Course Director, Imaging 505 "PET Principles and Applications", 1998-2004

PUBLICATIONS

Peer-reviewed publications

1. Sniderman AD, Herscovitch P, Marpole D, Fallen EL. Restoration of regional wall motion by nitroglycerin therapy in patients with left ventricular asynergy. *Chest* 1974; 66: 545-548.

2. Herscovitch P, Markham J, Raichle ME. Brain blood flow measured with intravenous $H_2{}^{15}O$. I. Theory and error analysis. *J Nucl Med* 1983; 24:782-789.

3. Raichle ME, Martin WRW, Herscovitch P, Mintun MA, Markham J. Brain blood flow measured with intravenous $H_2{}^{15}O$. II. Implementation and validation. *J Nucl Med 1983;* 24:790-798.

4. Herscovitch P, Raichle ME. Effect of tissue heterogeneity on the measurement of cerebral blood flow with the equilibrium $C^{15}O_2$ inhalation technique. *J Cereb Blood Flow Metab* 1983; 3:407-415.

5. Mintun MA, Raichle ME, Martin WRW, Herscovitch P. Brain oxygen utilization measured with O-15 radiotracers and positron emission tomography. *J Nucl Med* 1984; 25:177-187.

6. Volpe JJ, Herscovitch P, Perlman JM, Raichle ME. Positron emission tomography in the newborn: Extensive impairment of regional cerebral blood flow with intraventricular hemorrhage and hemorrhagic intracerebral involvement. *Pediatrics* 1983; 72:589-601.

7. Powers WJ, Martin WRW, Herscovitch P, Raichle ME, Grubb RL, Jr. Extracranial-intracranial bypass surgery: hemodynamic and metabolic effects. *Neurology 1984;* 34:1168-1174.

8. Reiman EM, Raichle ME, Butler FK, Herscovitch P, Robins E. A focal brain abnormality in panic disorder, a form of severe anxiety. *Nature 1984;* 310:683-685.

9. Fox PT, Mintun PA, Raichle ME, Herscovitch P: A noninvasive approach to quantitative functional brain mapping with $H_2{}^{15}O$ and positron emission tomography. *J Cereb Blood Flow Metab* 1985; 4:329-333.

10. Perlman JKM, Herscovitch P, Kreusser KL, Raichle ME, Volpe JJ. Positron emission tomography in the newborn: effect of seizure on regional cerebral flow in an infant. *Neurology* 1985; 35:244-247.

11. Herscovitch P, Raichle ME. What is the correct value for the brain:blood partition coefficient for water? *J Cereb Blood Flow Metab* 1985; 5:65-69.

12. Volpe JJ, Herscovitch P, Perlman JM, Kreusser KL, Raichle ME. Positron emission tomography in the asphyxiated newborn: parasagittal impairment of cerebral blood flow. *Ann Neurol* 1985; 17:287-296.

13. Herscovitch P, Mintun MA, Raichle ME. Brain oxygen utilization measured with O-15 radiotracers and positron emission tomography: generation of metabolic images. *J Nucl Med* 1985; 26:416-417.

14. Perlmutter JS, Herscovitch P, Powers WJ, Fox PT, Raichle ME. Standardized mean regional method for calculating global positron emission tomography measurements. *J Cereb Blood Flow Metab* 1985; 5:476-480.

15. Lauter JL, Herscovitch P, Formby C, Raichle ME. Tonotopic organization in human auditory cortex revealed by positron emission tomography. *Hearing Research* 1985*;* 20:199-205.

16. Ter-Pogossian MM, Herscovitch P. Radioactive oxygen-15 in the study of cerebral blood flow, blood volume, and oxygen metabolism. *Sem In Nucl Med* 1985*;* 15:377-394.

17. Herscovitch P, Auchus PA, Gado M, Chi D, Raichle ME. Correction of positron emission tomography data for cerebral atrophy. *J Cereb Blood Flow Metab* 1986; 6:120-124.

18. Reiman EM, Raichle ME, Robins E, Butler FK, Herscovitch P, Fox P, Perlmutter J. The application of positron emission tomography to the study of panic disorder. *Am J Psychiatry 1986;* 143:469-477.

19. Perlmutter JS, Powers WJ, Herscovitch P, Fox PT, Raichle ME. Regional asymmetries of cerebral blood flow, blood volume, oxygen utilization and extraction in normal subjects. *J Cereb Blood Flow Metab* 1987; 7:64-67.

20. Herscovitch P, Raichle ME, Kilbourn MR, Welch MJ. Positron emission tomographic measurement of cerebral blood flow and permeability-surface area product of water using ^{15}O-water and ^{11}C-butanol. *J Cereb Blood Flow Metab* 1987; 7:527-542.

21. Videen TO, Perlmutter JS, Herscovitch P, Raichle ME. Brain blood volume, flow, and oxygen utilization measured with O-15 radiotracers and positron emission tomography: revised metabolic computations. *J Cereb Blood Flow Metab* 1987; 7:513-516.

22. Altman DI, Powers WJ, Perlman JW, Herscovitch P, Volpe SL, Volpe JJ. Cerebral blood flow requirement for brain viability in newborn infants is lower than in adults. *Ann Neurol* 1988; 24:218-226.

23. Powers WJ, Stabin M, Howse D, Eichling JO, Herscovitch P. Radiation absorbed dose estimates for oxygen-15 radiopharmaceuticals in newborn infants. *J Nucl Med* 1988*;* 29:1961-1970.

24. Herscovitch P: Cerebral blood flow and metabolism measured with oxygen-15 radiotracers. *J Neuropsychiatry Clin Neurosci* 1989; 1:19-29.

25. Schapiro MB, Grady CL, Kumar A, Herscovitch P, Haxby JV, Moore AM, White B, Friedland RP, Rapoport SI. Regional cerebral glucose metabolism is normal in young adults with Down syndrome.
J Cereb Blood Flow Metab 1990; 10:199-206.

26. Goldstein DG, Smith CB, Herscovitch P, Austin SM, Eisenhofer G, Chang PC, Kopin IJ. Dosimetric estimates for clinical positron emission tomographic scanning after injection of [^{18}F]-6-fluorodopamine. *J Nucl Med* 1991; 32:102-110.

27. Haxby JV, Grady CL, Horwitz B, Ungerleider LG, Mishkin M, Carson RE, Herscovitch P, Schapiro MB, Rapoport SI. Dissociation of spatial and object visual processing pathways in human extrastriate cortex. *Proc Nat Acad Sci* 1991; 88:1621-1625.

28. Saris SC, Blasberg RG, Carson RE, DeVroom HL, Lutz RJ, Dedrick RL, Pettigrew K, Chang R, Doppman J, Wright DC, Herscovitch P, Oldfield EH: Intravascular streaming during carotid artery infusions: demonstration in humans and reduction using diastole-phased, pulsatile administration. *J Neurosurg* 1991; 74:763-772.

29. Powers WJ, Perlmutter JS, Videen TO, Herscovitch P, Griffeth LK, Royal HD, Siegel BA, Morris JC, Berg L. Blinded clinical evaluation of positron emission tomography for diagnosis of Alzheimer's disease. *Neurology 1992;* 42:765-770.

30. Grady C, Haxby J, Horwitz B, Schapiro M, Rapoport SI, Ungerleider L, Mishkin M, Carson R, Herscovitch P. Dissociation of object and spatial vision in human extrastriate cortex: Age-related changes in activation of regional cerebral blood flow measured with [^{15}O]water and positron emission tomography. *J Cog Neurosci* 1992; 4:23-34.

31. Theodore WH, Carson RE, Andreason P, Zametkin A, Blasberg R, Liederman DB, Rice K, Newman A, Channing M, Dunn B, Simpson N, Herscovitch P. PET imaging of opiate receptor binding in human epilepsy using [^{18}F]cyclofoxy. *Epilepsy Research* 1992; 13:129-139.

32. Kumar A, Braun A, Schapiro M, Grady C, Carson R, Herscovitch P. Cerebral glucose metabolic rates after 30 and 45 minute acquisitions: A comparative study. *J Nucl Med 1992;* 33:2103-2105.

33. Carson RE, Channing MA, Blasberg RG, Dunn BB, Cohen RM, Rice KC, Herscovitch P. Comparison of bolus and infusion methods for receptor quantitation: application to [^{18}F]-cyclofoxy and positron emission tomography. *J Cereb Blood Flow Metab* 1993; 13:24-42.

34. Grady CL, Haxby JV, Horwitz B, Gillette J, Salerno JA, Gonzales-Aviles A, Carson RE, Herscovitch P, Schapiro MB, Rapoport SI. Activation of regional cerebral blood flow during a face perception task in patients with dementia of the Alzheimer type. *Neurobiol Aging* 1993; 14:35-44.

35. Zametkin AJ, Liebenauer LL, Fitzgerald GA, King AC, Minkunas DV, Herscovitch P, Yamada EM, Cohen RM. Brain metabolism in teenagers with attention deficit hyperactivity disorder. *Arch Gen Psychiatry* 1993; 50:333-340.

36. Matthew E, Andreason P, Carson RE, Herscovitch P, Pettigrew K, Cohen R, King C, Johanson CE, Paul S. Reproducibility of resting cerebral blood flow measurements with $H_2{}^{15}O$ positron emission tomography in humans. *J Cereb Blood Flow Metab 1993;* 13:748-754.

37. Carson RE, Yan Y, Daube-Witherspoon ME, Freedman N, Bacharach SL, Herscovitch P. An approximation formula for the variance of PET region-of-interest values. *IEEE Trans Med Imag* 1993; 12:240-250.

38. Braun AR, Stoetter B, Randolph C, Hsiao J, Vladar K, Gernert J, Carson RE, Herscovitch P, Chase TN. The functional neuroanatomy of Tourette's syndrome: An FDG PET study. I. Regional changes in cerebral glucose metabolism differentiating patients and controls. *Neuropsychopharm* 1993; 9: 277-291.

39. Goldstein DS, Eisenhofer G, Dunn BB, Armando I, Lenders J, Grossman E, Holmes C, Kirk KL, Bacharach S, Adams R, Herscovitch P, Kopin IJ. Positron emission tomographic imaging of cardiac sympathetic innervation using 6-[^{18}F]fluorodopamine: Initial findings in humans. *J Amer Coll Cardiol* 1993; 22:1961-1971.

40. George, MS, Ketter TA, Gill DS, Haxby JV, Ungerleider LG, Herscovitch P, Post RM. Brain regions involved in recognizing facial emotion or identity: an oxygen-15 PET study. *J Neuropsychiat Clin Neurosci* 1993; 5:384-394.

41. George MS, Ketter TA, Parekh PI, Rosinsky N, Ring H, Casey BJ, Trimble MR, Horwitz B, Herscovitch P, Post RM. Regional brain activity when selecting a response despite interference: An $H_2{}^{15}O$ PET study of the Stroop and an emotional Stroop. *Human Brain Mapping* 1994; 1:194-209.

42. Braun AR, Carson RE, Adams HR, Finn RD, Francis BE, Herscovitch P. A kinetic comparison of [^{18}F]2-fluoro-2-deoxyglucose and [^{18}F]2-fluoro-2-deoxymannose using positron emission tomography. *Nucl Med Biol* 1994; 21:857-863.

43. Molchan SE, Sunderland T, McIntosh AR, Herscovitch P, Schreurs BG. A functional anatomical study of associative learning in humans. *Proceed Nat Acad Sci* 1994; 91:8122-8126.

44. Parekh P, Spencer JW, George MS, Gill DS, Ketter TA, Andreason P, Herscovitch P, Post RM. Procaine-induced increases in limbic rCBF correlate positively with increases in occipital and temporal fast EEG activity. *Brain Topogr* 1995; 7:209-216.

45. Matthew E, Andreason P, Pettigrew K, Carson RE, Herscovitch P, Cohen R, King C, Johanson C, Greenblatt D, Paul SM. Benzodiazepine receptors mediate regional blood flow changes in the living human brain. *Proc Nat Acad Sci* 1995; 92:2775-2779.

46. Berman KF, Ostrem J, Randolph C, Gold J, Goldberg TE, Coppola R, Carson RE, Herscovitch P, Weinberger DR. Physiological activation of a cortical network during performance of the Wisconsin Card Sort Test: a positron emission tomographic study. *Neuropsychologia* 1995; 33:1027-1046.

47. Gaillard WD, Fazilat S, White S, Malow B, Sato S, Reeves P, Herscovitch P, Theodore WH. Interictal metabolism and blood flow are uncoupled in temporal lobe cortex of patients with complex partial epilepsy. *Neurology* 1995; 45:1841-1847.

48. George MS, Ketter TA, Parekh PI, Horwitz B, Herscovitch P, Post RM. Brain activity during transient sadness and happiness in healthy women. *Am J Psychiatry* 1995*;* 152:341-351.

49. Braun AR, Randolph C, Stoetter B, Mohr E, Cox C, Vladar K, Sexton R, Carson RE, Herscovitch P, Chase TN. The functional neuroanatomy of Tourette's syndrome: An FDG PET study. II. Relationships between regional cerebral metabolism and associated behavioral and cognitive features of the illness. *Neuropsychopharm* 1995; 13:151-168.

50. Arai T, Wakabayashi S, Channing MA, Dunn BB, Der MG, Bell JM, Herscovitch P, Eckelman WC, Rapoport SI, Chang MCJ. Incorporation of [1-carbon-11] palmitate in monkey brain using PET. *J Nucl Med* 1995; 36:2261-2267.

51. VanMeter JW, Maisog JM, Zeffiro TA, Hallett M, Herscovitch P, Rapoport SI. Parametric analysis of positron emission tomography images: a variable-rate motor task. *NeuroImage* 1995; 2:273-283.

52. Ketter TA, Andreason PJ, George MS, Lee C, Gill DS, Parekh P, Herscovitch P, Post RM. Anterior paralimbic mediation of procaine-induced emotional and psychosensory experiences. *Arch Gen Psychiatry* 1996; 53:59-69.

53. George MS, Parekh PI, Rosinsky N, Ketter TA, Kimbrell TA, Heilman K, Herscovitch P, Post RM. Understanding emotional prosody activates right hemisphere regions: an O15-water PET study in healthy volunteers. *Arch Neurol* 1996; 53:665-670.

54. Zünkeler B, Carson RE, Olson J, Blasberg RG, Girton M, Bacher J, Herscovitch P, Oldfield EH. Hyperosmolar blood-barrier disruption in primates: an *in vivo* study using positron emission tomography and ^{82}rubidium. *J Neurosurg* 1996; 84:494-502.

55. Theodore W, Balish M, Leiderman D, Bromfield E, Sato S, Herscovitch P. The effect of seizures on cerebral blood flow measured with ^{15}O-H_2O and positron emission tomography. *Epilepsia* 1996; 37:796-802.

56. George MS, Ketter TA, Parekh PI, Herscovitch P, Post RM. Gender differences in regional cerebral blood flow during transient self-induced sadness or happiness. *Biol Psychiatry* 1996; 40:859-871.

57. Zünkeler B, Carson RE, Olson J, Blasberg R, DeVroom H, Lutz R, Saris S, Wright D, Kammerer W, Patronas N, Dedrick RL, Herscovitch P, Oldfield E. Quantitation of human blood-brain barrier disruption. *J Neurosurg* 1996; 85:1056-1065.

58. Marangell LB, Ketter TA, George MS, Pazzaglia PJ, Callahan AM, Parekh P, Andreason PJ Horwitz B, Herscovitch P, Post RM. Inverse relationship of peripheral thyrotropin-stimulating hormone levels to brain activity in mood disorders. *Am J Psychiatry* 1997; 154:224-230.

59. Schreurs BG, McIntosh AR, Bahro M, Herscovitch P, Sunderland T, Molchan SE. Lateralization and behavioral correlation of changes in regional cerebral blood flow with classical conditioning of the human eyeblink response. *J Neurophysiol* 1997; 77:2153-2163.

60. Aloj L, Carson RE, Lang L, Herscovitch P, Eckelman WC. Measurement of transferrin receptor kinetics in the baboon liver using dynamic positron emission tomography imaging and [^{18}F]holo-transferrin. *Hepatology* 1997; 25:986-990.

61. Sadato N, Carson RE, Daube-Witherspoon ME, Campbell G, Hallett M, Herscovitch P. Optimization of non-invasive activation studies with O-15 water and 3D PET. *J Cereb Blood Flow Metab 1997;* 17:732-739.

62. Braun AR, Balkin TJ, Wessenstein NJ, Carson RE, Varga M, Baldwin P, Belenky G, Herscovitch P. Regional cerebral blood flow during sleep and wakefulness: an $H_2{}^{15}O$ positron emission tomography study. *Brain* 1997; 120:1173-1197.

63. Chang MCJ, Arai T, Freed LM, Wakabayashi S, Channing MA, Dunn BB, Der MG, Bell JM, Herscovitch P, Eckelman WC, Rapoport SI. Brain incorporation of [1-11C]arachidonate in normocapnic and hypercapnic monkeys: a PET study. *Brain Res* 1997; 755:74-83.

64. Kiesewetter DO, Carson RE, Jagoda EM, Endres CJ, Der MG, Herscovitch P, Eckelman WC. In vivo muscarinic binding selectivity of (R,S) and (R,R)-[^{18}F]fluoromethyl QNB. *Bioorganic Med Chem* 1997; 5:1555-1567.

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6. Kimbrell TA, Ketter TA, George MS, Little JT, Benson BE, Willis MW, Herscovitch P, Post RM: Comment on “Regional cerebral glucose utilization in patients with a range of severities of unipolar depression”. Biol Psychiatry 52:1031-1032, 2002.

Invited Lectures

Canadian Anaesthetists’ Society Annual Meeting, Quebec City, Canada, May1982. “Regional vs. global cerebral metabolism”

Department of Neurosciences, University of Calgary Medical School, Calgary, Canada, November 1982. “Positron emission tomography: from image to applications”

Devices and Technology Branch Contractors Meeting, NHLBI, NIH, Washington D.C, December 1982. “Measurement of cerebral blood flow with positron emission tomography”

Stroke Centers Directors' Workshop, San Diego CA, February 1983. “Cerebral blood flow: Introduction to the radioisotopic methods and a discussion of the effects of tissue inhomogeneity”

National Alliance for the Mentally Ill, Annual Conference, St. Louis, MO, August,1983. “Positron emission tomography - current applications in psychiatry and neurology”

National Conference on Biological Imaging II. Clinical Aspect, National Academy of Sciences, Washington D.C., October 1983. “Positron emission tomography - physiological and clinical application”

Alberta Heritage Foundation for Medical Research Lecturer, University of Alberta, Edmonton, Canada, September 1984. “Positron emission tomography - technical aspects” and “Positron emission tomography - applications”

Brain Agent Symposium, Mallinckrodt Inc., St. Louis, MO, May 1985. “Tracer techniques for tomographic measurement of cerebral blood flow”

Society of Nuclear Medicine Midwinter meeting, San Antonio, February 1987. Symposium on Perfusion Imaging, “First pass techniques for measuring CBF with O-15 Water”

Johns Hopkins Medical Institutions, Baltimore, MD, March 1988. Imaging Living Brain Chemistry: Principles and Practice, “Cerebral blood flow and metabolism measured with oxygen-15 radiotracers”

Johns Hopkins Medical Institutions, Division of Nuclear Medicine, Baltimore, MD, February 1990. “Recent PET studies with O-15 labelled water”

University of Iowa, Dept of Neurology, Iowa City, IA, April 1990. “PET cerebral blood flow studies with oxygen-15 water”

Case Western Reserve University Hospitals PET Program, Cleveland, OH, October,1991. “PET cerebral blood flow studies”

American Society of Hospital Pharmacists, New Orleans, December 1991. “Application of positron emission tomography in psychopharmacology research”

John Hopkins University, Baltimore, MD, March 1992. PET and SPECT Imaging of Living Brain Chemistry in Health and Disease. “Task-related patterns of cerebral activation”

Biomedical Engineering Society Meeting, PET & Modeling Symposium, Salt Lake City, Oct 18, 1992. “PET and modeling: blood flow and metabolism”

University of Minnesota PET Program, Minneapolis, November 1992. “PET studies of the brain”

American Speech Language Hearing Association annual conference, New Orleans, Nov 16, 1994. Research Frontiers in Brain Imaging, “PET - basic principles and applications to the study of auditory and language processing”

NIMH Workshop on Psychotropic Medications and the Developing Brain, Bethesda, MD, July 16, 1997. “Applications of PET to the study of CNS effects of psychotropics”

Kuhl-Lassen Award Lecture, Society of Nuclear Medicine, St. Louis MO, June 2000. “Challenges for clinical functional brain imaging”

Society for Nuclear Imaging in Drug Development meeting, Bethesda MD, Oct 23, 2000. “Can O-15 Water Be Used to Evaluate Drugs?”

Uniformed Services University of the Health Sciences, Dept of Psychiatry Seminar Series, Bethesda MD, Feb 1, 2001. "Positron emission tomography"

American Pharmacists Association, San Francisco CA, March 19, 2001. "PET in the Evaluation of Drug Effects"

First International Workshop on Endocrine Hypertension, Bethesda, MD, Nov 16, 2001. "Use of PET scanning in clinical cancer research"

NIAID 2nd Annual Workshop on Experimental Imaging of Infectious Disease, Bethesda MD, September 18, 2007. "PET imaging of nonhuman primates"

3rd Annual Kim Paterson Lang Lecture, Chester-Crozer Medical Center, Philadelphia, Nov 16, 2007. "Molecular Imaging with PET"

Division of Medical Imaging and Hematology Products, CDER, U.S. Food and Drug Administration, Rockville, MD, January 8, 2008. "Molecular Imaging with PET"

Neuroimaging in Obesity Research Workshop, NIDDK, NIH, Bethesda MD, Oct 27, 2008. "PET Methods for Functional Neuroimaging and PET Data Analysis"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Dec 1, 2009. "Neurologic Imaging in the Era of Molecular Medicine"

American Pharmacists Association annual meeting, Washington DC, March 14, 2010. "PET Imaging in Drug Development: Focus on Clinical Trials"

University of Maryland Radiology Department Grand Rounds, Baltimore, March 17, 2010. "Molecular Imaging of Neuropsychiatric Disorders with PET: Three Decades of Clinical Research"

American Academy of Neurology annual meeting, Toronto, April 16, 2010. AAN Future of Neuroscience Conference, "The New PET: Imaging Molecular Targets in Neurological Disease"

International Tuberculosis Research Center, Masan Korea, October 27, 2010. "PET Imaging in Drug Development and Clinical Trials: Relevance to Tuberculosis"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Dec 2, 2010. Refresher Course: "PET Imaging of Neuropsychiatric Disorders"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Dec 1, 2011. Refresher Course: "PET Imaging of Neuropsychiatric Disorders"

Society of Nuclear Medicine, Western Region annual meeting, Monterey, CA, Oct 26, 2012. "National Issues in Nuclear Medicine"

Medical Imaging Technology Alliance PET Endpoints Workshop, Baltimore, Nov 13, 2012. "Appropriate Use Criteria for beta-Amyloid PET Imaging"

American Association for Geriatric Psychiatry annual meeting, Los Angeles, March 16, 2013. "Emerging Concepts in Appropriate Use Criteria for Amyloid PET Imaging"

Society of Nuclear Medicine and Molecular Imaging, MidEastern Chapter, Ocean City MD, April 12, 2013. "Molecular Imaging of Dementia"

The Ottawa Hospital, Ottawa, Canada, May 9, 2013, City-wide Nuclear Medicine Grand Rounds, "Amyloid Imaging in Dementia"; and May 10, 2013, Neurology Grand Rounds. "Molecular Imaging of the Brain with PET"

Society of Nuclear Medicine and Molecular Imaging annual meeting, Vancouver BC, June 11, 2013. "Clinical Diagnosis of Alzheimer's Disease and Approval for Amyloid PET"

European Association of Nuclear Medicine annual meeting, Lyon France, Oct 21, 2013. "Dementia Imaging with Amyloid Agents"

Society of Nuclear Medicine and Molecular Imaging, Missouri Valley Region meeting, Omaha NE, Oct 2013. "Molecular Imaging of Dementia"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Dec 2013. "Making Molecular Brain Imaging Available in the Clinic: FDA and CMS"

Johns Hopkins University School of Medicine, Baltimore, March 2014. Nuclear Molecular Imaging and Therapy: Focus on Value symposium, "Appropriate Use of Amyloid Imaging"

Association of University Radiologists annual meeting, Baltimore MD, April 4, 2014. "Nuclear Medicine and Molecular Imaging of the Future"

Canadian Association of Nuclear Medicine annual meeting, Calgary, Alberta, April 12, 2014. "Molecular Imaging in Neuropsychiatry"

American Psychiatric Association annual meeting, New York, May 4, 2014. "PET Amyloid Imaging: Appropriate Use Criteria Development and CMS Consideration"

Tsinghua University Graduate School, International Symposium for Translational Theranostics, Shenzhen, China, May 26, 2014. "Amyloid Imaging in the Development of Anti-Alzheimer Disease Therapeutics"

Peking Union Medical College, International Symposium on Molecular Imaging and Translational Medicine, Beijing, Sept 14, 2014. "PET in Drug Development and Translation"

European Association of Nuclear Medicine annual meeting, Gothenburg Sweden, Oct 21, 2014. "Regulatory Approval – The Final Step in Translational Molecular Imaging"

Japanese Society of Nuclear Medicine 54th Annual Scientific Meeting, Osaka, Nov 6, 2014. "PET in Neuroscience"

Korean Society of Nuclear Medicine annual meeting, Seoul, Nov 8, 2014. "Molecular Imaging of the Brain with PET"

EE Kim Distinguished Lectureship, Department of Nuclear Medicine, Seoul National University College of Medicine, Seoul, Korea, Nov 10, 2014. “PET in Drug Development and Translation”

Radiologic Society of North America (RSNA) annual meeting, Chicago, Dec 2014. “Making Molecular Brain Imaging Available in the Clinic: FDA and CMS”

Canadian Association of Nuclear Medicine annual meeting, Montreal, Jan 30, 2015. “PET Imaging and Dementia in 2015 and Beyond”

Society of Nuclear Medicine and Molecular Imaging, Southwest Chapter, Austin TX, April 12, 2015. “Contributions of PET to Clinical Neuroscience”

Australia New Zealand Society of Nuclear Medicine annual meeting, Brisbane, April 19, 2015. “Contributions of PET to Clinical Neuroscience”

Sydney Medical School, Weastmead Hospital, Nuclear Medicine Rounds, Sydney Australia, April 21, 2015. ““PET in Drug Development and Translation”

American College of Radiology (ACR) annual meeting, Washington DC, May 18, 2015. “Translation to the Clinic: FDA Approval and CMS Coverage for Amyloid Radiopharmaceuticals”

Society of Nuclear Medicine and Molecular Imaging, Northeast Region annual meeting, Newport RI, Nov 6, 2015. “PET Imaging in Dementia”

Radiologic Society of North America (RSNA) annual meeting, Chicago, Nov 30, 2015. “Making Molecular Brain Imaging Available in the Clinic: FDA, CMS, and the IDEAS Study”

Chinese Society for Cerebral Blood Flow & Metabolism and Chinese Stroke Association, Shijiazhuang, China, February 27, 2016. “Contributions of PET to Clinical Neuroscience”

Montreal Neurological Institute, McGill University, May 30, 2016, William Feindel Brain Imaging Lecture series, “Contributions of PET to Basic and Clinical Neuroscience”

Society of Nuclear Medicine and Molecular Imaging annual meeting, San Diego, June 11, 2016. “Update on Amyloid Brain Imaging”

Society of Nuclear Medicine and Molecular Imaging annual meeting, San Diego, June 12, 2016. “IDEAS: Imaging Dementia – Evidence for Amyloid Scanning Study”

Georgetown University Medical Center, Radiology Grand Rounds, Washington DC, September 23, 2016. “Molecular Imaging in Dementia”

Peterson Memorial Lecture in Nuclear Medicine, University of Iowa School of Medicine, Iowa City IA, November 14, 2016. “Contributions of PET to Basic and Clinical Neuroscience”

Radiologic Society of North America (RSNA) annual meeting, Chicago, Nov 28, 2016. “Clinical Translation in Molecular Brain Imaging”

Society of Nuclear Medicine and Molecular Imaging midwinter meeting, Phoenix AZ, January 22, 2017. “How to Lead a Clinical Molecular Imaging Program”

Chinese Society for Cerebral Blood Flow & Metabolism, Guangzhou, China, March 4, 2017. "Molecular Imaging of Alzheimer's Disease and Related Disorders"

Society of Nuclear Medicine and Molecular Imaging annual meeting, Denver CO, June 13, 2017. "Molecular Imaging Programs for Clinical Research"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Nov 27, 2017. "Making Molecular Brain Imaging Available in the Clinic: FDA, CMS and the IDEAS Study"

Society of Nuclear Medicine and Molecular Imaging Mideast Chapter meeting, April 13, 2018. "Neuroimaging in Nuclear Medicine with Emphasis on Amyloid Imaging"

World Federation of Nuclear Medicine and Biology meeting, Melbourne Australia, April 22, 2018. "Tracer Kinetic Modeling in Brain PET"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Nov 26, 2018. "Clinical Trials and Approval Process for New Brain MI Radiopharmaceuticals"

Society of Nuclear Medicine and Molecular Imaging annual meeting, Anaheim CA, June 25, 2019. "Molecular Imaging of Dementia"

International Society for Cerebral Blood Flow and Metabolism BRAIN/BRAINPET meeting, Yokohama Japan, July 6, 2019, plenary lecture. "Advances in Neuroimaging with PET"

Shanghai Jiao Tong University, School of Biomedical Engineering, Shanghai, Oct 31, 2019. "Advances in Brain Imaging with PET: 40 Years of Progress"

Radiologic Society of North America (RSNA) annual meeting, Chicago, Dec 2, 2019. "New Brain Molecular Imaging Tracers"

American Society for Nuclear Cardiology annual meeting, Sept 24, 2020. "Making PET Imaging Available in the Clinic"

Radiologic Society of North America (RSNA) annual meeting, Chicago, 2021.
Nov 29, 2021. Keynote talk, Brain Science Session, "Advances in Molecular Brain Imaging;"
Dec 2, 2021. "New Brain Molecular Imaging Tracers"

Radiologic Society of North America (RSNA) annual meeting, Chicago, 2022.
Nov 28, 2022: Keynote talk, Nuclear Medicine (Brain) Science Session, "Focus on Patient Health Outcomes"; Nov 30, 2022. "Read with the Experts: Translating Molecular Brain Imaging to the Clinic"

Society of Nuclear Medicine and Molecular Imaging Mid-Winter meeting, San Francisco, Jan 28, 2023. "Regulatory Challenges in Brain Molecular Imaging"

2nd Annual Alavi-Bradley Symposium on Molecular Imaging and Theranostics, University of Maryland Medical School, Baltimore, Sept 19, 2023. "Molecular Imaging of Neurodegenerative Diseases."

Society of Nuclear Medicine and Molecular Imaging Mid-Winter meeting and American Collge of Nuclear Medicine Annual Meeting, Orlando, Feb 2, 2024. “Molecular Imaging of Dementia”

Invited Participant/Discussant, Workshops and Symposia

NIMH Human Brain Project Clinical Neuroscience Workshop, Rockville, MD, discussant, Feb 28, 1992.

NINDS Workshop on Positron Emission Tomography, Bethesda, MD, invited speaker Nov 9-10, 1992.

NIMH Mentored Awardees meeting, Brain Imaging in Depression, Discussant, Rockville, MD, June 23, 1994.

Perfusion Imaging Workshop, Discussant, NIMH, Bethesda, MD, Oct 20, 1997.

3rd Cologne PET Symposium, Invited participant, Dec 8-10, 1999.

4th International Scientific Symposium on Tourette Syndrome, “Neuroimaging and Neurophysiology”, discussant, Cleveland OH, June 2004.

Infectious Disease Imaging Workshop, Invited participant, NIAID, San Antonio TX, Feb 2-3, 2009.

Positron Emission Tomography Evidence Workshop, Center for the Evaluation of Value and Risk in Health, Invited participant, Arlington VA, Feb 24, 2015

Brain Scanning to Assess for Traumatic Injury and Encephalopathy (SAFTIE) Symposium, Dallas TX, May 6-7, 2017.

Pathways for Successful Translation of New Imaging Agents and Modalities: Phase III Studies workshop, NCI, Rockville, MD, May 15, 2017.