

WYNN ARTHUR VOLKERT, Ph.D.

Curriculum Vitae

EDUCATION: St. Louis University, B. S. (Chemistry) 1963
University of Missouri, Ph.D. (Physical Chemistry) 1968

ACADEMIC APPOINTMENTS:

Director, Radiopharmaceutical Sciences Institute, 1999 - present

Curators Professor Emeritus of Radiology, Biochemistry, Chemistry, NSEI, 2007

Interim Director, Nuclear Science and Engineering Institute, 2001-2006

Curators Professor of Radiological Sciences, Biochemistry, Chemistry,
and Nuclear Engineering, University of Missouri, Columbia, Missouri,
September 1, 2000-2006

Professor of Radiological Sciences, Biochemistry, Chemistry, and Nuclear Engineering,
University of Missouri, Columbia, Missouri, 1981-2000

Senior Research Career Scientist, H.S. Truman Memorial Veterans Hospital, Columbia,
MO April 1, 1999 - 2001

Associate Research Career Scientist, Veterans Administration Research Division, H.S.
Truman Memorial Veterans Hospital, Columbia, MO 1988-1998

Visiting Research Professor, Division of Radiopharmacy, Paul Scherrer Institute,
Villigen, Switzerland, January 15 - August 30, 1997 Research Leave with Professor P.A.
Schubiger, ETH-Zurich (Swiss Confederation Institute of Technology)

Visiting Research Professor in Radiopharmaceutical Chemistry, George Washington
University, Washington, D. C., March 1 - August 31, 1981 Research Leave with Professor
W. Eckelman

Doctoral and Graduate Faculty Member, University of Missouri, Columbia, Missouri,
1976-present

Associate Professor of Radiological Sciences & Biochemistry, University of Missouri,
Columbia, Missouri, 1973-1981

Associate Investigator, Dalton Research Center, University of Missouri, Columbia,
Missouri, 1969-1981

Assistant Professor of Radiological Sciences, University of Missouri, Columbia,
Missouri, 1969-1973

Research Associate in Physiology, NASA Postdoctoral Fellow University of Missouri,
Columbia, Missouri, 1967-1969

ADMINISTRATIVE APPOINTMENTS:

Director of Radiopharmaceutical Sciences Institute, February 1999-present

Director, Radiological Sciences Section Department of Radiology, University of Missouri-Columbia, September 1984-2006

Chairman of Board, Missouri Foundation for Medical Research, H.S. Truman Memorial Hospital, 1991-present

Interim Chairman, Department of Radiology, University of Missouri-Columbia
4/1/87-8/1/87

Director, Nuclear Medicine Technology Educational Program, University of Missouri-Columbia, 1976-1984

DEPARTMENT OF VETERANS AFFAIRS (DVA) SERVICE:

National

Program Specialist in Radiology and Nuclear Medicine, Medical Research Division, DVA Health Services and Research Administration, 1990-1996.

Reviewer for Merit Review proposals, Medical Research Division, DVA

H.S. Truman Memorial VAMC

Radiation Safety Committee, 1976 – present, Chair, 1996 – 2008.

Research and Development Committee, 1988-93 and 1998-2001, Chair, 1990-93

Research Space Committee, 1990-1993 and 1997-present, Chairman, 1990-1993

Coordinating Committee for Core Immunology and Cell Culture Facility, 1990-1993

Board of Directors, Missouri Foundation for Medical Research (not-for-profit foundation at VAMC), 1991-present; Chairman of Board, 1991-present.

MEMBERSHIP IN NATIONAL PROFESSIONAL ORGANIZATIONS:

Society of Radiopharmaceutical Sciences, 2003-present

President-Elect, 2007-2009

Board of Directors, 2007 – present

BoD Education Sub-committee, Chair, 2007 -

Society of Nuclear Medicine; Member 1974-present

Isotope Tax Force, 2008-

National Radionuclide Production Facility Task Force, 2003-2006

House of Delegates (Radiopharm. Council Delegate) 2001

Board of Trustees 1987-1989, 1993-1996

Government Relations Committee; 1996-2003

Radiotherapy Council, 1992-present

Isotope Availability Committee, 1990-1998; Chairman 1991-1998

Commission on Radiopharmaceuticals, 1995-present

Commission on Scientific Affairs and Research, 1995-1997

Nominating Committee 1987-1989

Ad Hoc Committee on Council Coordination 1986-1988

Credentials and Membership Committee 1986-1988

Pharmacopeia Committee 1989-2003
Scientific Reviewer and Sub-Program Chairman for Annual SNM
Meeting (5 years)

American Nuclear Society, 2002-present
General Chair, Embedded Topical Workshop on Isotopes for Medicine and Industry,
American Nuclear Society, Ann. Mtg., Anaheim, CA, June 9-11, 2008

Missouri Valley Chapter - SNM; Member 1974-Present
Board of Directors 1980-1991
Ann. Mtg. Scientific Prog. Chairman 1974, 1981 and 1986
President-Elect 1985-1987
President 1987-1989
Sigma Xi; Member 1968-present; MU Chapter President 1988-1989,
Vice President 1987-1988; Secretary Treasurer, 1985-1987
American Chemical Society; 1963-present
Biophysical Society; 1972-present
International Association of Radiopharmacology; 1989-2003
Society of Molecular Imaging; 2003-present
Radiation Research Society; 1968-present
Radiopharmaceutical Science Council (USA); Member 1976-present,
President-Elect 1986-1987; President 1987-1988
Elected Delegate fo SNM House of Delegates, 2001
Mid-Missouri Sub Chapter - SNM
Vice-President 1985
President 1986, 1994
Oak Ridge Associate Universities
Visiting Scholars Program, Lecturer 1989-92

HONORS AND POSTDOCTORATE:

Entrepreneur of the Year Award, University of Missouri, 2005
Missourian of the Year Award, State of Missouri House of Representatives, 2005
Curators Professorship, University of Missouri Board of Curators, 2000
Nuclear Medicine and Biology, Editorial Board 2001 - present
Editorial Advisory Board Journal of Bioconjugate Chemistry, 1999 - present
University of Missouri Faculty-Alumni Award Recipient, 1992
Honorary President, ^{99m}Tc-HMPAO Brain Blood Flow Symposium, September 1987,
Copenhagen, Denmark
Alpha Chi Sigma, Chemistry Honorary, 1965
Pi Mu Upsilon, Mathematics Honorary, 1963
Postdoctorate in Physiology, University of Missouri-Columbia 1967-1969, NASA Fellow
Who's Who in Missouri Education
RAD Award (Residents Award for Dedication), Outstanding Teacher, Department of
Radiology, University of Missouri
Outstanding Teacher Award, NMT, School of Health Related Professions
Outstanding Performance Award, Research Service, H.S. Truman Memorial VA Hospital

GRANT AND SCIENTIFIC REVIEW ACTIVITIES:

National Institute of Health
Member, NIH Study Section, DMP, Drug Discovery and Molecular Pharmacology,
February, 2007

Member, NIH Special Study Section, PAR 04-0-69; *In Vivo* Cellular and Molecular Imaging Centers (ICMICs), November, 2004 and November 2005

Member NIH Special Study Section, ZHL1 (SR-K S1); Cellular and Molecular Imaging of Cardiovascular, Pulmonary and Hematopoietic Systems, June 2004.

Member, NIH Radiation Physics Study Section ZRG1 RTB(II), November 6, 2003
Diagnostic Radiology Study Section; 1998

Member, NIH Special Study Section ZRG1-SSS-1(11)., July 11-12, 2002

Invited Participant at NIH Workshop on *In Vivo* Molecular Imaging Center Grant Awardees

Ad Hoc Reviewer and Site Visitor for NIH Individual Grant and Program Project Proposals, 1985-present

Multidisciplinary Sciences Special Emphasis Review Panel, ZRG-7-DMG(4);1997-98

Department of Veterans Affairs Health Services and Research Administration, 1990-1996
Program Specialist in Radiology and Nuclear Medicine, Medical Research Division

U.S. Dept. of Energy, Review Panel for National Biomedical Tracer Facility 1995

U.S. Dept. of Energy, Workshop Panel Member on Radiochemistry Research Resources, April 2002

Brookhaven National Laboratory, U.S. Department of Energy, National Advisory Committee for Production of Radioisotopes for Biomedical Research, 1996-1998

Oak Ridge National Laboratory, U.S. Department of Energy, Advisory Committee for the Chemical Technology Division, 1966

Reviewer for DOE Grant Proposals, 1985-present

Reviewer for DVA Merit Review Proposals, 1988-present

Reviewer for NSF Grant Proposals, 1976-1979

Reviewer for PRF Grant Proposals, 1978-1984

Reviewer for several scientific journals (incl. J Nucl Med, Int J Nucl Med Biol, Int J Appl Radiat Isotopes, and Bioconj. Chem.).

U.S. Department of Energy and Nuclear Energy Institute
New Nuclear Science and Engineering Institute Concept Presentation, January 16-18, 2002, Washington, D.C.

Participant in DOE Workshop on Radiochemistry Research Resources, April 24, 2002, Chicago, IL

University Nuclear Science and Engineering Program Directors Meeting with Congressional Delegates, Washington, D.C., June 26-27, 2002

PUBLICATIONS

(Refereed Journals Only)

1. Volkert, W. A. and Kuntz, R. R.: The Reactions of Hydrogen Atoms in Aqueous Solution, Some Amino Acids. J. Phys. Chem., 72:3394- 3400, 1968.
2. Volkert, W. A. and Musacchia, X. J.: Blood Gases in Hamsters During Hypothermia by Exposure to He-O₂ Mixture and Cold. Am. J. Physiol., 219:919-922, 1970.
3. Waite, L., Volkert, W. A., and Kenny, A. D.: Inhibition of Bone Resorption by Acetazolamide in the Rat. Endocrinology, 87:1129- 1139, 1970.
4. Musacchia, X. J., Volkert, W. A., and Barr, R. E.: Radio- Resistance in Hamsters During Hypothermic Depression Metabolism Induces with Helium and Low Temperatures.

- Radiation Research, 46:353-361, 1971.
5. Musacchia, X. J. and Volkert, W. A.: Blood Gases and Hb-O₂ Dissociation in Hibernating and Active Ground Squirrels. Am. J. Physiol., 221:128-130, 1971.
 6. Anderson, G., Volkert, W. A., and Musacchia, X. J.: O₂ Consumption, electrocardiogram and spontaneous respiration of hypothermic hamsters. Am. J. Physiol., 221:1774-1778, 1971.
 7. Ghiron, C. A., Volkert, W. A., and Lahmeyer, H.: Studies on the Mechanism of Cystine Destruction and Inactivation of Trypsin by 280 nm Light. Photochem. Photobiol., 13:431-436, 1971.
 8. Musacchia, X. J., Volkert, W. A., Prewitt, R., and Chandler, R.: The Synergistic Role of Temperature and Exposure to Ionizing Radiation. Environmental Physiol., 5:179-184, 1972.
 9. Kenny, A. D., Dacke, C. G., Wagstaff, D. J., Musacchia, X. J., and Volkert, W. A.: Effects of DDT on Calcium Metabolism in the Japanese Quail. Trace Substances in Environ. Health, 5:247-255, 1972.
 10. Volkert, W. A. and Ghiron, C. A.: The Destruction of Tryptophanyl Residues in Trypsin by 280 nm Radiation. Photochem. Photobiol., 17:9-16, 1973.
 11. Volkert, W. A. and Grossweiner, L. I.: Flash Photoysis of Ribonuclease A. Photochem. Photobiol., 17:81-91, 1973.
 12. Dacke, C. G., Musacchia, X. J., Volkert, W. A., and Kenny, A. D.: Cyclical Fluctuations in the Levels of Blood Calcium, pH, and pCO₂ in Japanese Quail. Comp. Biochem. Physiol., 44A:1267-1275, 1973.
 13. Volkert, W. A. and Musacchia, X. J.: Hypothermia Induction and Survival in Hamsters: The Role of Temperature Acclimation and Anesthetic (Halothane). Cryobiology, 13:361-367, 1976.
 14. Evans, R. E., Volkert, W. A. and Ghiron, C.A.: Use of Vidicon Detection System in Flash Photolysis; Application to the Flash Photolysis of N-Acetyl-L-Tryptophanamide. Photochemistry and Photobiology, 24:3-7, 1976.
 15. Evans, R. F., Volkert, W. A., Ghiron, C. A. and Kuntz, R. R.: Flash Photolysis of N-Acetyltryptophanamide; Acid Base Equilibrium of Radical Transients. Chem. Phys. Lett., 42:43-45, 1976.
 16. Evans, R. F., Volkert, W. A., Ghiron, C. A., Kuntz, R. R., Santus, R. and Bazin, M.: Flash Photolysis of N-Acetyltryptophanamide; Evidence for Radical Production Without Hydrated Electron Formation. Chem. Phys. Lett., 42:39-42, 1976.
 17. Evans, R. F., Kuntz, R. R., Ghiron, C. A. and Volkert, W. A.: Flash Photolysis of N-Acetyltryptophanamide; Proton Quenching of Radical and Electron Production. Chem. Phys. Lett., 42:415-418, 1976.
 18. Volkert, W. A., Kuntz, R. R., Ghiron, C. A., Evans, R. F., and Santus, R.: Flash Photolysis of Tryptophan and N-Acetyl-L-Tryptophanamide; the Effect of Bromide on

- Transient Yields, Photochem. Photobiol., 26:3-9, 1977.
19. Kuntz, R. R., Ghiron, C. A. and Volkert, W. A.: An Estimate of Direct N-H Bond Cleavage in the Photolysis of Indole Derivatives. J. Photochem., 7, 363, 1977.
 20. Evans, R. F., Kuntz, R. R., Volkert, W. A. and Ghiron, C. A.: Flash Photolysis of N-Acetyltryptophanamide; the Relationship Between Radical Yields and Fluorescence Quenching. Photochem. Photobiol., 27 511-515, 1978.
 21. Hicks, B., White, M., Ghiron, C. A., Kuntz, R. R. and Volkert, W. A.: Flash Photolysis of Human Serum Albumin; Characterization of the Indole Triplet Absorption Spectrum and Decay at Ambient Temperature. Proc. Natl. Acad. Sci., USA, 75:1172-1175, 1978.
 22. White, M., Kuntz, R. R., Ghiron, C. A. and Volkert, W. A.: Flash Photolysis of Bovine Serum Albumin; Identification and Decay Kinetics of Transient Intermediates. Photochem. Photobiol., 28:413-416, 1978.
 23. Simon, J., Ketring, A. R., Troutner, D. E., Volkert, W. A. and Holmes, R. A.: Labeling a Macrocyclic Tetraaza Ligand with ^{99m}Tc. Radiochem. Radioanal. Lett. 38:133-142, 1979.
 24. Troutner, D. E., Simon, J., Ketring, A. R., Volkert, W. A. and Holmes, R. A.: Complexing of Tc-99m with Cyclam. J. Nucl. Med. 21:443-448, 1980.
 25. Simon, J., Volkert, W. A., Troutner, D. E. and Holmes, R. A.: Radiochemical Characterization of Tc-99m-Cyclam. Radiochem. Radioanal. Lett. 47:111-124, 1981.
 26. Ehrhardt, G. J., and Volkert, W. A.: A New Cd-115/In-115m Radioisotope Generator. J. Nucl. Med. 24:349-352, 1983.
 27. Zuckman, S. A., Freeman, G. W., Troutner, D. E., Volkert, W. A., Holmes, R. A., Van Derveer, D. G. and Barefield, E. K.: Preparation and X-ray Structure of trans, Dioxo (1,4,4,11- tetraazacyclo-tetradecane) Tc(V) Perchlorate Monohydrate. Inorg. Chem., 20:2386-2389, 1981.
 28. Volkert, W. A., Troutner, D. E. and Holmes, R. A.: Labeling of Amine Ligands with Tc-99m in Aqueous Solutions by Ligand Exchange. Int. J. Appl. Radiat. Isotopes, 33:891-896, 1982.
 29. Troutner, D.A., Volkert, W.A., and Hoffman, T.J.: Reaction to Cyclam with Reduced No-carrier Added Tc-99m. J of Lab. Comp. and Radiopharmaceuticals, 19:1595-1598, 1982.
 30. Eckelman, W. C. and Volkert, W. A.: In Vivo Chemistry of Tc-99m- Chelates. Int. J. Appl. Radiat. and Isotopes, 33:941-946, 1982.
 31. Paik, C. H., Murphy, P. R., Eckelman, W. C., Volkert, W. A., and Reba, R. C.: Optimization of the DTPA Mixed Anhydride Reaction with Antibodies at Low Concentration. J. Nuc. Med. 24:932-936, 1983.
 32. Hoffman, T. J., Volkert, W. A., Troutner, D. E., and Holmes, R. A.: Reverse Phase HPLC of Tc-99m Tetraamine Complexes. Int. J. Appl. Radiat. and Isotope 35:223-225, 1984.

33. Troutner, D. E., Volkert, W. A. Hoffman, T. J., and Holmes, R. A.: A Neutral Lipophilic Complex of Tc-99m with a Multidentate Amine Oxime. Int. J. Appl. Radiat. and Isotopes, 35:467-470, 1984.
34. Ketring, A. R., Troutner, D. E., Hoffman, T. J., Stanton, D. K., Volkert, W. A. and Holmes, R. A.: Biodistribution of Lipophilic Tc-99m Complexes and Cyclam Derivatives. Int. J. Nucl. Med. and Biol. 9:113-119, 1984.
35. Volkert, W. A., Hoffman, T. J., Seger, R. M., Troutner, D. E., and Holmes. R. A., Tc-99m-Propylene Amine Oxime (Tc-99m-PnAO): A Potential Brain Radiopharmaceutical. Eur. J. Nucl. Med. 9:511- 516, 1984.
36. Volkert, W. A., McKenzie, E. H., Hoffman, T. J., Troutner, D. E. and Holmes, R. A., The Behavior of Neutral Amine Oxime Chelates Labelled with Tc at the Tracer Level, Int. J. Nucl. Med. and Biol 11:243-246, 1984.
37. Troutner, D.E., Aston, K. and Volkert, W.A.: ⁹⁹Tc complexes of amine oximes. J Labl Compd Radiopharm 21:1041-1043, 1984.
38. McKenzie, E. H., W. A. Volkert, and R. A. Holmes, Biodistribution of C-14-PnAO in Rats, Int. J. Nucl. Med. Biol. 12:2:113-114, 1985.
39. Volkert, W. A., Edwards, B., Simon, J., Wilson, D. A., McKenzie, E. H., Oberle, P. and Holmes, R. A., Skeletal uptake properties of Tc-99m-labeled multidentate phosphonate ligands, J. Labeled Cpds, 21:1063-65, 1984.
40. Nowotnik, D. P., Canning, L. R., Cumming, S. A., Harrison, B., Nechvatal, G., Pickett, R. D., Piper, I. M., Neirinckx, R. D., Volkert, W. A., Troutner, D. E. and Holmes, R. A., Development of a Tc-99m-Labelled Radiopharmaceutical for Cerebral Blood Flow Imaging, Nucl. Med. Comm., 6:499-506, 1985.
41. Holmes, R. A., Chaplin, S. B., Royston, K. G., Hoffman, T. J., and Volkert, W. A., Cerebral Uptake and Retention of Tc-99m-HM- PAO, Nucl. Med. Comm. 6:306-309, 1985.
42. Chaplin, S. B., Oberle, P. A., McKenzie, E. H., Hoffman, T. J., Volkert, W. A. and Holmes, R. A., Regional Cerebral Uptake and Retention of Tc-99m-Tetramethyl- and Pentamethyl-Propylene-Amine Oxime Chelates. Int. J. Nucl. Med. Biol. 13:261-267 (1986).
43. Volkert, W. A., Edwards, B., Simon, J., Wilson, D. A., McKenzie, E., Oberle, P. and Holmes, R. A.: In vivo Skeletal Localization Properties of Tc-99m-Complexes of Large Phosphonate Ligands, Int. J. Nucl. & Biol. 13:1:31-37, 1986.
44. L. R. Canning, G. Nechvatal, S. A. Cumming, D. P. Nowotnik, R. D. Pickett, I. M. Piper, R. D. Neirinckx, W. A. Volkert, D. E. Troutner and R. A. Holmes: Technetium -99m-hexamethyl- propyleneamineoxime (Tc-HM-PAO): a new radiopharmaceutical for rCBF imaging. Nuklearmedizin 22, S173-5, 1986.
45. S. A. Cumming, G. Nechvatal, L. R. Canning, D. P. Nowotnik, R. D. Pickett, R. D. Neirinckx, W. A. Volkert, D. E. Troutner and R. A. Holmes: Development of technetium-99m regional cerebral blood flow agents based on the propyleneamineoxime

- ligand (PnAO), Nuclearmedizin, 22, S594-6, 1986.
46. Goeckeler, W. F., Troutner, D. E., Volkert, W. A., Edwards, B., Simon, J. and Wilson, D.: Sm-153 Radiotherapeutic Bone Agents, Int. J. Rad. Appl. Instrumentation, Part B: Nucl. Med. & Bio. 13(4):479-482, 1985.
 47. Volkert, W.A., Hoffman, T.J., McKenzie, E.H., Holmes, R.A., Nowotnik, D.P. and Neirinckx, D.: Regional cerebral uptake of ^{99m}Tc -d,l-HMPAO compared to other rCBF tracers. J. Labl. Compds. Radiopharm 23:1326-1328. 1986.
 48. Garlich, J.R., Baughman, S.A., Simon, J., McMillan, K., Ketring, A.R., Volkert, W.A., Goeckeler, W.F. and Troutner, D.E.: Chemical considerations of ^{153}Sm -EDTMP, a new therapeutic bone agent. J Labl Compds Radiopharm 23:1341-1343, 1986.
 49. Simon J., Goeckeler W.F., Edwards, B., Stringham L., Volkert, W.A., Troutner, D.E. and Holmes, R.A.: ^{153}Sm -EDTMP, a potential therapeutic bone agent. J Labl Compd Radiopharm 23:1344-1346, 1986.
 50. Ehrhardt, G.J., Ketring, A.R., and Volkert W.A.: Production of ^{153}Sm for radiotherapeutic applications. J Labl Compd Radiopharm 23:1370-1371, 1986.
 51. Logan, K. W., Volkert, W. A., and Holmes, R. A., Radiation Dose Calculations in Persons Receiving Injections of Sm-153-EDTMP, J. Nucl. Med. 28(4):505-509, 1987.
 52. Goeckeler, W. F., Edwards, B., Volkert, W. A., Troutner, D. E., Holmes, R. A., Simon, J. and Wilson, D., Skeletal Localization Properties of Sm-153-Chelates; Potential Radiotherapeutic Agents, J. Nucl. Med 28 (4):495-504, 1987.
 53. Franz, J, Freeman, GM, Barefield, EK, Volkert, WA, Ehrhardt, GJ and Holmes, RA.: Labeling of Antibodies with Cu-64 Using a Conjugate Containing Macrocyclic Amine Chelating Agent, Nucl. Med. Biol. 14 (5):479-484, 1987
 54. Neirinckx, R.D., Canning, L.R., Piper, I.M., Nowotnik, D.P., Harrison, R. C., Volkert, W.A., Hoffman, T.J., Chaplin, S. B. and Holmes, R. A., Tc-99m-d,l-HM-PAO: A New Radiopharmaceutical for SPECT Imaging of Regional Cerebral Blood Flow, J. Nucl. Med. 28:191-202, 1987.
 55. Franz, J., Volkert, W. A., Barefield, E. K., and Holmes, R. A.: Production of Tc-99m-Labeled Conjugated Antibodies Using a Cyclam Based Bifunctional Chelating Agent, Nucl Med Biol 14:569-572, 1987.
 56. Simon, J., Wilson, D.A., Baughman, S.A., McMillian, K., Leggett, D., Goeckeler, W.F., Stringham, L.M. and Volkert, W.A.: The relationship of $\log K_s$ of ^{153}Sm -aminophosphonate and aminocarboxylate complexes with skeletal uptakes in rats. J Labl Compd Radiopharm 25, 1988.
 57. Hoffman, T. J., Volkert, W. A., and Holmes, R. A., A Microcomputer Based Digital Image Analysis System for Quantitative Autoradiography, J. Physiol. Imaging 3:81-90, 1988
 58. Hung, C-Y, Corlija, M., Volkert, W. A., and Holmes, R. A.: A Kinetic Analysis of Tc-99m-Hexamethylpropyleneamine Oxime Decomposition in Aqueous Media, J Nucl Med 29:1568-76, 1988

59. Hoffman, T. J., Corlija, M., Chaplin, S. B., Volkert, W. A., and Holmes, R. A.: Retention of Tc-99m-d,l-HMPAO in Rat Brain; An Autoradiographic Study, J. Cereb. Blood Flow Metab. 8:S38-43, 1988
60. Hung, C-Y, Volkert, W.A. and Holmes, R.A.: Stabilization of ^{99m}Tc-Hexamethyl-propyleneamine oxime Using Gentisic Acid, Nucl. Med. Biol. 16:675-680, 1989
61. Volkert, W. A., Simon, J., Ketring, A. R., Holmes, R. A., Lattimer, J. C. and Corwin, L. A.: Radiolabeled Phosphonic Acid Chelates: Potential Therapeutic Agents for Treatment of Skeletal Metastases. Drugs of the Future, 14:799-811, 1989
62. Volkert, W. A., Hoffman, T. J. and Holmes, R. A. ^{99m}Tc-d,l-HMPAO, A Regional Blood Flow Tracer; Chemical and Pharmacological Properties. Ind J Nucl Med 4:111-118, 1989
63. Singh, A., Holmes, R. A., Farhangi, M., Volkert, W. A., Williams, A., Stringham, L. M., and Ketring, A. R. Clinical Pharmacokinetics of ¹⁵³Sm-EDTMP in Metastatic Cancer. J Nuclear Med 30:1814-1818, 1989
64. Lattimer, J. C., Corwin, L. A., Stapleton, J., Volkert, W. A., Ketring, A. R., Ehrhardt, G. J., Anderson, S. K., Simon, J. and Goeckeler, W. F. Clinical and clinicopathologic response of canine primary bone tumor patients to treatment with ¹⁵³Sm-EDTMP. J Nuclear Med 31:1316-1325, 1990.
65. Lattimer, J. C., Corwin, L. A., Stapleton, J., Volkert, W. A., Ketring, A. R., Ehrhardt, G. J., Anderson, S. K., Simon, J. and Goeckeler, W. F. Clinical and Clinicopathologic Effects of Samarium 153-EDTMP Administered Intravenously in Two Normal Dogs. J Nucl Med 31:586-593, 1990.
66. Volkert, W. A., Hoffman, T.J.: Advances in Radiopharmaceuticals for Brain Imaging with Single-photon Emission Computed Tomography. Curr Opin Radiol 2(4):556-558, 1990
67. Tubergen, K., Corlija, M., Volkert, W.A. and Holmes, R.A.: Sensitivity of ^{99m}Tc-d,l-HMPAO to Radiolysis in Aqueous Solution. J Nucl Med 32:111-115, 1991.
68. Corlija, M., Volkert, W.A., John, C.S., Pillai, M.R.A., Lo, J.M., Troutner, D.E. and Holmes, R.A.: Biolocalization and Cell Labeling Properties of Neutral-Lypophilic ^{99m}Tc -Amine-Phenol Chelates. Nucl Med Biol 18(2):167-172, 1991.
69. Ghiron, J., Volkert, W.A., Garlich, J. and Holmes, R.A.: Determination of Lesion to Normal Bone Uptake Ratios of Skeletal Radiopharmaceuticals by QARG. Nucl Med Biol 18:235-240, 1991.
70. Tubergen, K., Corlija, M., Ramamoorthy, N., Pillai, M.R.A., Volkert, W.A., Troutner, D.E., and Holmes R.A.: Studies on the Stability of Tc-d,l-HMPAO in Aqueous Solutions. J Labl Compd Radiopharm 30:50-51, 1991.
71. Volkert, W.A., Goeckeler, W.F., Ehrhardt, G.J., and Ketring, A.R.: Therapeutic radionuclides: production and decay property considerations. J Nucl Med 32:174-185 1991.
72. Johnson, J.C., Langhorst, S.M., Loyalka, S.K., Volkert, W.A., Ketring, A.R.:

Calculation of radiation dose at a bone to marrow interface using Monte Carlo modeling techniques (EGS4). J Nucl Med 32: 623-628 1992.

73. Farhangi, M., Holmes, R.A., Volkert, W.A., Logan, K.W., Singh, A.: ^{153}Sm -EDTMP, a radiotherapeutic agent for palliative treatment of metastatic bone cancer pain. J Nucl Med 33:1451-1458, 1992.
74. Roth, C.A., Hoffman, T.J., Corlija, M., Volkert, W.A., Holmes, R.A.: The effect of ligand structure on glutathione mediated decomposition of propyleneamine oxime derivatives. Nucl Med Biol, Int. J. Radiat. Appl. Instrum. Part B., 19(7):783-790, 1992.
75. Hoffman, T.J., Volkert, W.A., Corlija, M., McKenzie, E.H., Chaplin, S.B., Oberle, P.A., Holmes, R.A.: Evaluation of alkylated derivatives of $^{99\text{m}}\text{Tc}$ -Propylene amine oxime ($^{99\text{m}}\text{Tc}$ -PnAO). J of Nucl Biol Med 36(1):46-51, 1992.
76. Katti, K.V., Singh, P.R., Volkert, W.A., Ketrings, A.R., Katti, K.K.: A new neutral-lipophilic $^{99\text{m}}\text{Tc}$ -complex with a bis-hydrazine phosphine (BHP ligand). Appl Radiat Isot 43:1151-1154, 1992.
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ABSTRACTS

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FDA APPLICATIONS PREPARED AND FILED:

Drug Master Files (DMF) Assembled and Written

1. DMF #5077; R. A. Holmes and W. A. Volkert, Tc-99m-Propylene Amine Oxime (Tc-99m-PnAO), September 1983.
2. DMF #5456; R. A. Holmes and W. A. Volkert, Tc-99m-hexamethylpropleneamine oxime (Tc-99m-HM-PAO), April 1985.
3. DMF #6341; R. A. Holmes, W. A. Volkert and G. Ehrhardt, Sm-153-ethylenediamine tetramethylenephosphonic acid (Sm-153-EDTMP), 1987.

Investigational New Drug (IND) Applications for FDA Approved Clinical Trials

IND #21,530; In-111-labeled leukocytes for abscess imaging, May 1984; IND #22,832; Tc-99m-PnAO for cerebral blood flow imaging, September 1983; IND #26,282; Tc-99m-HM-PAO for cerebral blood flow studies, April 1985; IND #27,865; Sm-153-EDTMP uptake in bone cancer, April, 1985; IND #29156; I-131-metaiodobenzyl guanidine sulfate (I-131-MIBG), May 1984; IND #30,154; I-123-IMP for brain perfusion studies, June, 1987; IND #33,240; Sm-153-EDTMP for palliation of pain in patients with bone cancer, 1998.

SERVICE COMMITTEES:

VA Hospital

- VA Research and Development Committee, 1988-1993 and 1998
-present; Chairman, 1990-1993
- VA Research Space Committee, 1990-1993 and 1997-present
- VA Committee for Core Immunology and Cell Culture Facility,
1990-1993
- VA Hospital Radiation Safety Committee, 1983-present; Chairman,
1991-present

University Wide and Columbia Campus

Reactor Safety Subcommittee, 1972-1999
Campus Radiation Safety Committee, 1973-1994 - (Chairman, 1975-1994)
University Wide Radiation Safety Committee, 1974-1993
(Chairman, 1982-1993)
University Wide Risk Management Committee, 1982-1985
Research Council, Columbia Campus, 1974-77
Sigma Xi, Research Award Committee, 1979-80 (Chairman)
Sigma Xi, Nominating Committee, 1982-83 (Chairman)
Committee on Grant and Contract Incentive Policy for UMC, 1989-90
Search Committee for Director of MU Research Reactor, 1989-90
Committee for Review of Programs and Operations of the MU Research
Reactor, 1989-90
MURR Research Subcommittee of Reactor Advisory Committee,
1991-1998
MURR Reactor Advisory Committee, 1995-present; Chairman 2000-present
Commission on International Initiatives, 1997-1999
Life Sciences Mission Enhancement Committee, 1998-2001
Comprehensive Cancer Center Task Force, 1998-2001

School of Medicine

Education Council, Medical School, 1981-1984
Research Council, Medical School, 1979-81, 1984-85, 1988-91, 1995-97
Promotions and Tenure Committee, Medical School, 1973-74, 1992-1995
Chairman, 1994-95
Medical School Self-Study Task Force; Liaison Committee on Medical
Education, Chair, Basic Science Departments Subcommittee, 1993 and 1999
Department of Radiology Chairman Search Committee, 1999
School of Medicine Research Planning Group for Cancer Research, 2001
SOM Administrators Research Council, 2002-present

School of Health Related Professions

Student Affairs Committee, 1979-80
Promotion and Tenure Committee, 1979-1984
Nuclear Medicine Technology Educational Program Admissions Committee, 1986-present
Nuclear Medicine Technology Program Advisory Committee 1986-present

DEPARTMENTAL:

Education Committee, 1980-1986
Resident Selection Committee, 1980-1990
Promotion and Tenure Committee, 1978-1987; 1988-present
Director, Radiological Sciences Section, 1984-present
Radiology Chairman Search Committee, 1986

PRIMARY CLINICAL SERVICE RENDERED IS IN THE NUCLEAR MEDICINE SECTION AND INCLUDES:

1. Supervision of Radiopharmaceutical Preparation and Quality Control.
2. Primarily responsible for developing and directing special in vitro patient procedures (e.g. ferrokinetics, in vivo cross matches, RBC-sequestration, In-111 White Cells, etc.)

3. Development of special labeling procedures (e.g. Tc-99m-RBC labeling for spleen scans, aerosol inhalation studies, etc.) and develop new analytical methods for QA.
4. Write Investigative New Drug Applications (IND's) to FDA.
5. Major participant in many aspects of the Nuclear Medicine Technology Educational Program.
6. Coordinate clinical protocols in Nuclear Medicine using investigative radioactive drugs (e.g., Study Coordinator for Phase III trials using ^{153}Sm -EDTMP [IND #33,240, as a potential pain palliation drug for bone cancer patients).

TEACHING ACTIVITIES:

Diagnostic Radiology Residents and Nuclear Medicine Residents:

Radiation Biology, Approx. 10 lectures yearly
 Radiopharmacy in Nuclear Medicine, 10 lectures yearly

Graduate and Undergraduate Teaching:

Radiol. 328 (3 hr) - "Introd. Radiat. Biology", Course Coordinator (course taught every year - Fall Semester); 1972-present

Radiol. Tec. 329 (3 hr) - Radiopharmaceuticals in Nuclear Medicine (course taught every year - Fall Semester); 1976-present

Radiol. 400 and Rad. Tech. 300 - Problems Courses and provided lectures in other UMC courses (e.g. NE 303, Chem. 461)

Medical Students:

Radiology Block, 12 lectures yearly, Risks to personnel and patients from medical radiation exposures.

FUNDED RESEARCH ACTIVITIES (* = direct costs only, all others, indirect costs included)

NSF - CHE - 76 18707

"Photoprocesses in Tryptophan and Model Compounds", \$120,000.* October 1973 - June 30, 1978. Principal Investigator with C. A. Ghiron and R. R. Kuntz.

V. A. MEDICAL PROTOCOL

" $^{99\text{mTc}}$ -Labeled Macrocyclic Compounds as New Radiopharmaceuticals". \$30,000,* December 1, 1977 - September 30, 1979. Co-Principal Investigator with R. A. Holmes and D. Troutner.

V. A. MEDICAL PROTOCOL - Merit Review

"Tc-99m Macrocyclic Amines: A Basis for New Radiopharmaceuticals," \$104,000.* July 1, 1979 - September 30, 1982. Co-Principal Investigator with R. A. Holmes and D. Troutner.

Contract - Mallinckrodt Nuclear

Cd-115/In-115m In Generator and Abscess Localization of $^{115m}\text{In}+3$ in Mice," \$14,800, May 1980 - 1981. Co-Principal Investigator with Drs. G. Ehrhardt and R. A. Holmes.

NIH-NCI-CA27182-D1A1:

"Developing Macrocyclic Amines as Tc-99m-Imaging Agents," \$282,637.* March 1, 1982 - June 30, 1985. Principal Investigator with Drs. D. E. Troutner and R. A. Holmes.

V. A. Medical Research Service Merit Review

"Tc-99m-Labeled Cyclam: A Basis for New Radiopharmaceuticals," \$131,000.* October 1, 1982 - April 1, 1986. Co-Principal Investigator with R. A. Holmes (Co-P.I.) and D. E. Troutner.

DOW Chemical Company

"Tc-99m-Complexation and *in vivo* Localization of New Sulfonate and Phosphonate Ligands," \$105,000.* March 1, 1982 - February 28, 1984. Principal Investigator.

DOW Chemical Company

"Biolocalization Studies With New Bone Therapeutic Agents" \$110,000.* March 1, 1984 - May 31, 1985. Principal Investigator with Drs. D. E. Troutner, L. Corwin and J. Lattimer.

Amersham International

"Evaluation of the Potential of Tc-99m-PnAO and Its Derivatives as Radiopharmaceuticals," \$227,269* October 20, 1983 - October 19, 1986. Co-Principal Investigator with Dr. R. A. Holmes.

Missouri Research Assistant Act, State of Missouri

"Sm-153-Phosphonate Complexes as Therapeutic Agents for Bone Cancer," \$750,000*. June 1, 1985 - May 31, 1988. Principal Investigator, Co-Investigators, D. E. Troutner, J. Lattimer, L. Corwin and G. Ehrhardt.

VA Medical Research Service Merit Review

"Tc-99m Labeled Macrocyclic Amines: A Basis for New Radiopharmaceuticals, \$264,000.* April 1, 1986 - March 31, 1989. Co-Investigator with R. A. Holmes (PI) and D. E. Troutner.

VA Medical Research Service Merit Review

"Tc-99m-HMPAO Labeled Leukocytes and Platelets: Basic and Clinical Studies", \$219,421.* April 1, 1988-March 31, 1991. Principal Investigator. Co-Investigators: R. A. Holmes and T. P. Dresser.

U.S. Department of Veterans Affairs

Career Research Scientist Award: August 1, 1988 - March 30, 1999; \$1,040,000*

VA Medical Research Service Merit Review

"Tc-99m Labeled Macrocyclic Amines: A Basis for New Radiopharmaceuticals", \$647,800.* April 1, 1989-March 31, 1994. Co-Principal Investigator with R. A. Holmes (PI), D. E. Troutner and T. J. Hoffman.

Department of Energy, DOE-910571-1

"Production of Radiolabeled Monoclonal Antibody Conjugates by Photoaffinity Labeling," \$573,689. September 1, 1989-August 31, 1992. Principal Investigator. Co-investigators: R.R. Kuntz, A.R. Ketring, E.P. Mitchell, T.A. Feldbush and R.A. Holmes.

Department of Veterans Affairs, Medical Research Division

"¹⁵³Sm-EDTMP Chelates as Skeletal Therapeutic Radiopharmaceuticals", \$355,740*; April 1, 1991 - March 31, 1995. Principal Investigator.

Department of Energy, DOE-910571-2

"Production of Radiolabeled Monoclonal Antibody Conjugates by Photoaffinity Labeling," \$464,189; September 1, 1992 - October 31, 1995. Principal Investigator. Co-Investigators: R.R. Kuntz, A.R. Ketring, K.V. Katti, and R.A. Holmes.

Mallinckrodt Medical, Inc.

"Development of New MRI Contrast Agents", \$214,000*; June 1, 1992 - May 30, 1994. Co-Investigator with A.R. Ketring (PI) and K.V. Katti (Co-PI).

Zynaxis Cell Science, Inc.: "Development of new bifunctional chelates derived from phosphorus-nitrogen frameworks, \$52,800.* March 1, 1993 - March 1, 1994, K.V. Katti (PI) and W.A. Volkert (Co-I).

DuPont Merck: "Utility of phosphinimine and related ligands for the design of new ^{99m}Tc and ¹⁸⁸Re radiopharmaceuticals", \$239,657. December 1, 1993 - November 30, 1995. K.V. Katti (PI), P.R. Singh, W.A. Volkert and A.R. Ketring (Co-I's).

VA Medical Research Service Merit Review

"Development of Tumor Seeking Peptide Receptor Radiopharmaceuticals". \$248,000*, April 1, 1994-March 31, 1996. Co-Principal Investigator with Dr. R. A. Holmes (PI), T.J. Hoffman (Co-I) and K. V. Katti (Co-I).

DuPont Merck: "Utility of phosphinimine and related ligands for the design of new ^{99m}Tc and ¹⁸⁸Re radiopharmaceuticals", \$145,000, December 1, 1995 - November 30, 1996; K.V. Katti (PI), P.R. Singh, W.A. Volkert and A.R. Ketring (Co-I's).

Department of Veterans Affairs, Medical Research Division

"Development of GRP receptor-avid radiopharmaceuticals", \$108,200*, October 1, 1996 - September 30, 1997. W.A. Volkert (PI), T.J. Hoffman, D.K. Strickland, B.S. Greenspan, T.P. Dresser (Co-I's).

Department of Energy, DEFG02 89E R60875

"Novel Strategies for the Formulation of New Site-Directed Diagnostic and Therapeutic Radiopharmaceuticals", November 1, 1995 - October 31, 1998. Total: \$598,000; W.A. Volkert (PI) (25%), K.V. Katti (Co-PI) (25%); L.R. Forte (Co-I) (5%).

National Institutes of Health (NCI): RO1-CA72942-01 "Development of GRP Receptor-Avid Radiopharmaceuticals", October 1, 1997 - June 30, 2002. Total: \$931,555, W. Volkert (PI) (30%), T. Hoffman, B. Greenspan, T.D. Dresser, Co-I's.

DuPont-Merck: Utility of water-soluble phosphines and related ligands for the design of new ^{99m}Tc and ¹⁸⁸Re Radiopharmaceuticals. \$296,562 December 1, 1996 - November 30, 1998. K.V. Katti (PI), W.A. Volkert (10%) and A.R. Ketring (Co-I's).

National Institutes of Health (NCI): RO1-CA72421-01 "Radiolabeling of FABs by Photochemical Conjugation", June 1, 1998 - May 30, 2003. Total: \$464,710; R.R. Kuntz (PI), W. Volkert (Co-I) (5%) and T. Quinn (Co-I).

Department of Energy: DOE-FG02-93E61661 "Radiolabeled Peptide-based Melanoma and Breast Carcinoma Imaging and Therapeutic Agents". March 1, 1997 - February 28, 2000. Total:

\$451,787; T.P. Quinn (PI), S.S. Jurisson (Co-I), W.A. Volkert (Co-I) (5%).

DuPont-Merck: Utility of water-soluble phosphines and related ligands for the design of new ^{99m}Tc and ^{188}Re Radiopharmaceuticals. December 1, 1998 - November 31, 2000, \$180,034, K.V. Katti (PI), W.A. Volkert (10%).

Department of Energy, DEFG02 89E R60875
"Novel Strategies for the Formulation of New Site-Directed Diagnostic and Therapeutic Radiopharmaceuticals", November 1, 1998 – April 30, 2002. Total: \$510,000; W.A. Volkert (PI) (25%), K.V. Katti (Co-PI) (25%); L.R. Forte (Co-I) (5%). [One year no-cost extension]

U.S. Department of Veterans Affairs
Senior Research Career Scientist Award; April 1, 1999-October 30, 2001. Total: \$280,000*

DOE DE-FG02-93ER61661 (renewal) Department of Energy
"Melanoma Therapy with Rhenium-cyclized Melanocyte Stimulating Hormone Peptide Analogs. The major goal of the proposed research is to determine the therapeutic efficacy of [Re-188]-CCMSH in melanoma tumor bearing mice". March 1, 2000 – February 29, 2003, Total: \$403,133; T.P. Quinn (PI), S. Deutscher (Co-I) and W.V. Volkert (Co-I) (5%).

National Institute of Health (NCI) P20-CA86290
"Center for single photon-emitting cancer imaging agents: Pre-ICMIC". July 1, 2000 - June 30, 2003. Total: \$1,200,000; W.A. Volkert (PI).

National Institute of Health (NCI) P50-CA-103130
Single Photon-emitting Cancer Imaging Agents (P-50 Center Grant). August 1, 2003-July 31, 2008. Total: \$10,000,000; W.A. Volkert (PI) S. Deutscher (Co-PI).

U.S. Dept. of Energy, Radiochemistry Education Award Program, August 1, 1999 – August 31, 2002, \$248,000. W.H. Miller (P.I.), S.S. Jurisson (Co-P.I.), W.A. Volkert (Co-I) (5%).

U.S. Department of Veterans Affairs, Medical Research Division
"Combinatorial Chemistry and Genetics to Develop Tumor-avid Peptides": October 1, 2002 – September 30, 2006. Total: \$671,700; S. Deutscher (PI), W.A. Volkert, Collaborator (5%)

National Institute of Health (NCI) RO1-CA095075
"Colon Cancer Specific Radiodiagnostic/Therapeutic Agents", April 1, 2002 – March 31, 2005, \$769,494; W.A. Volkert (PI)

American Cancer Society (Volkert, Co-I) T.J. Hoffman, PI
"Targeting Prostate Cancer with Peptide Analogs", July 1, 2002 – June 30, 2006, \$735,520

DOE DE-FG07-03ID 14531(Volkert, PI)
Department of Energy: "The Midwest Nuclear Science and Engineering Consortium: An Innovative Approach to Enhancing Nuclear Science Education and Research", October 1, 2003-9/30/08, \$600,000 Year 1; \$1,400,000 Year 2; \$2,000,000 requested for Years 3-5.

DOE DE FG07 02ID14360 Miller 8/2003
Department of Energy: "DOE/Utility Matching Grant Program for Nuclear Engineering", September 1, 2003 – August 31, 2004, \$24,000. (W. Miller, PI, W. A. Volkert, Co-PI)

DOD BC032697 (Giblin, M., PI)

Department of Defense: “In vivo Imaging of Breast Cancer Using Radiolabeled Urokinase-Type Plasminogen Activator (uPA) Analogs”. July 30, 2004 – July 29, 2005. \$94,500 (\$75,000 Direct) (W. Volkert, T. Hoffman, L. Forte, Co-I’s)

National Institute of Biomedical Imaging (NIH) (Volkert, Co-I) C.J. Smith, PI

“Preparation of Low Valent Tc(I) Imaging Agents”, September 1, 2004 – August 31, 2006; \$363,750.