

CURRICULUM VITAE

George Zubal, Ph.D., F.A.B.N.M

Owner and General Manager
Z-Concepts LLC, East Haven, CT
and
Associate Researcher
Department of Neurology
Yale School of Medicine, Yale University

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East Haven, CT, 06512
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EDUCATION and DISTINCTIONS:

Board Certification: American Board of Science in Nuclear Medicine, 1991
D.A.B.S.N.M.
Fellowship Fellow of the American College of Nuclear Medicine, 1999
F.A.C.N.M.
1975-1981 Ph.D. Bio-Physics - June 1981
The University of Saarland, Department of Bio-Physics,
Saarbrucken, Germany
1972-1974 M.Sc. in Nuclear Engineering - June 1974
The Ohio State University, College of Nuclear Engineering,
Columbus, Ohio
1968-1972 B.S. in Engineering Physics - June 1972
The Ohio State University, College of Engineering Physics,
Columbus, Ohio

PROFESSIONAL HISTORY:

9/2015 – present **Visiting Professor**, Medical Imaging, University of Arizona, Tucson, AZ

11/2014 – present **Owner and CEO**, Z-Concepts LLC, East Haven, CT

9/2012 – present **Associate Researcher**, Neurology, Yale University, New Haven, CT

9/2006 – 10/2014 **Director of Imaging Development**, Molecular NeuroImaging L.L.C. and the Institute for NeuroDegenerative Disorders, New Haven CT.

Overall supervision of PET and SPECT cameras and acquisition protocols as well as the technologists; supervision of image-processing core-lab for the evaluation of new radiopharmaceuticals and therapies for neurodegenerative disorders under pharmaceutical company sponsored clinical trials.

- o- conducted Investigator Meetings for clinical trials using beta amyloid as a PET biomarker for testing therapies for Alzheimer's disease;

- o-designed and implemented automated DaTSCAN clinical analysis software (OSA) for hospital-based Parkinson's imaging (installed at beta-test sites);

- o-designed and implemented automated beta amyloid clinical analysis software (ADER) for hospital-based Alzheimer's imaging (installed at beta-test sites);

- o-negotiated contracting for FDA 510(k) approval of OSA and ADER clinical software;

6/1992 – 9/2006 **Associate Professor of Diagnostic Imaging** Yale University School of Medicine.

Image processing for improved clinical interpretation of brain scans. Compartmental modeling applied to scintigraphic images. Monte Carlo simulations of SPECT images applied to improved reconstruction algorithms. Registration and superposition of inter-modality images, in particular for ictal-interictal SPECT imaging in epilepsy.

Technical Director of Nuclear Medicine, Yale New Haven Hospital. Responsible for all aspects of SPECT and planar clinical imaging, hot-lab operations, and general clinical computer processing.

Sabbatical 1/2 year (9/2001-1/2002): Project Manager for Kinetic Analysis of FDG Uptake in Living Rat Brain Slices from Dynamic Positron Autoradiography, at the Biomedical Imaging Research Center, Fukui Medical University, Matsuoka, Fukui, Japan.

7/1986 - 6/1992 **Assistant Professor of Diagnostic Imaging**, Nuclear Medicine Physicist, Yale University School of Medicine. Lecturer (“Physics in Nuclear Medicine”) for medical residents and technologists. Development of computerized clinical image analysis software for general nuclear medicine.

1/1983 - 7/1986 **Principal Scientist and Medical Computers Project Manager**, Nuclear Products and Ultrasound Division, Picker International, Northford, CT. Project manager for Picker's PCS-512 nuclear medicine computer, supervised system architecture, clinical software development, and networking concept.

7/1981 - 12/1983 **Assistant Scientist (post-doc)**, Medical Department, Brookhaven National Laboratory, Upton, New York. Development of interface sub-system for acquisition of nuclear camera data correlated with physiological patient data.

RESEARCH GRANTS AWARDED:

NIH STTR Phase II renewal, 5R42NS055475-06, “Computational Tools for Research in Neuroscience, Behavioral Science and Mental Health”,
Principle Investigator: George Zubal, % effort: 30,
Total grant: \$2,300,000, Aug 20012 - July 2015.

DOE SBIR Phase I and II, 85215S08-I “Development of Automated Software Program for the Analysis of Alzheimer's Disease Beta-Amyloid Scans”,
Principle Investigator: George Zubal, % effort: 30,
Total grant: \$800,200, Aug 2008 - July 2012.

NIH SBIR FastTrack NS055475 “Automated Parkinson's Disease Dopamine Transporter Scan Analysis Fast Track”,
Principle Investigator: George Zubal, % effort: 30,
Total grant: \$545,200, Aug 2007 - July 2010.

DOE SBIR Phase I, 83229S07-I "Development of Automated Software Program for the Analysis of Peripheral Benzodiazepine Receptors ",
Principle Investigator: George Zubal, % effort: 30,
Total grant: \$95,000, awarded May 2007,overlap with NIH.

NIH R01 grant, NS35674, “Quantitative Ictal Flow Changes in Localizing Epilepsy”,
Principle Investigator: George Zubal, % effort: 30,
Total grant: \$1,387,000, April 1997 - March 2002.

NIH subcontract, NS32879, “Improved Algorithms and Priors for SPECT Reconstruction”,
Principal Investigator: George Zubal, % effort: 15,
Total grant: \$228,000, June 1995 - May 1999.

Whitaker Foundation, “Computer Based Inter-Modality Analysis of Tomographic Images of the Human Brain”,
Principal Investigator: George Zubal, % effort: 30,
Total grant: \$173,751, March 1989 - April 1992.

DOE, DE-FG02-88ER60724, “Computer Simulated Images of Radiopharmaceutical Distributions in Digital Anthropomorphic Phantoms”
Principal Investigator: George Zubal, % effort: 30,
Total grant: \$435,090, Nov. 1988 - Oct. 1991.

PREVIOUS ACADEMIC APPOINTMENTS:

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| 2012-present | Associate Researcher, Neurology, Yale University |
| 2006-2012 | Faculty Lecturer for Yale Nuclear Medicine Residency Program on SPECT/PET imaging and analysis |
| 1992-2000 | Guest Faculty Lecturer for the “Cerebral SPECT Imaging Mini-Fellowship Program”, Columbia University, Dept. of Radiology (held semi-annually). |
| 1986-2000 | Director of Nuclear Medical Technologists Program at Gateway/Yale New Haven Hospital. |
| 1986-9 | Faculty lecturer at Quinnipiac College, Department of Radiological Sciences. |
| 1984-6 | Industrial Research Collaborator for the Medical Department, Associated Universities, Inc. Brookhaven National Laboratory, Upton, New York. |
| 1982-5 | Assistant Professor of Radiology, School of Medicine, State University of New York at Stony Brook, Stony Brook, NY |
| 1982-3 | Consulting Lecturer, School of Nuclear Medicine Technology, Veterans Administration Hospital, Northport, NY. |

PROFESSIONAL MEMBERSHIP AND COMMITTEES:

Journal of Nuclear Medicine, Editorial Board, January, 2000 – present
IEEE Nuclear and Plasma Sciences, Nuclear Medicine and Imaging Sciences Council
member, January, 2000 – present.
Yale University, Department of Radiology, Research Management Committee
April 1, 1996-2000
Yale New Haven Hospital, Radioactive Drug Research Committee
Member, June 1, 1995-present; Chairman, March 2000 - present
Yale New Haven Hospital, Radioactivity Safety Committee
Member, June 1, 1995-present; Chairman, March 2000 - present
ASNC – American Society of Nuclear Cardiology, full member
Program Coordinator for American Society of Nuclear Cardiology's “Basic
Radioisotope Handling Techniques” 200 hour NRC Licensing Lecture Series held
annually in Bethesda MD. 1995 - 2002.
ABSNM - American Board of Science in Nuclear Medicine.
ABSNM elected president, 1994-6.
ABSNM elected secretary/treasurer, 1993-4.
SNM – Society of Nuclear Medicine and Molecular Imaging (SNMMI)
BOD elected Director at Large 2004-7
SNM - Computer and Instrumentation Council member
elected president 2003-5
elected secretary/treasurer 1992-4
SNM – Candidate to the presidency of SNM 2006
Sigma Xi Society member, since 1993
IEEE - Institute of Electrical and Electronics Engineers, member
AAPM American Association of Physicists in Medicine, member
AAPM Nuclear Medicine Committee 1994-7

ACADEMIC THESIS ADVISOR FOR:

“Small-Scale Dosimetry of Thyroid with Iodine-123 using a Paired Image Radiation Transport Model: a Monte Carlo Study”, PhD Doctoral Dissertation to be submitted to Biomedical Engineering, University of Massachusetts at Lowell, Mike Tabriz, June 2017.

“Optimum Design Characteristics of a New Generation Compton Gamma Camera for Nuclear Medicine”, PhD Doctoral Dissertation submitted to Biomedical Engineering Yale University, Sudhakar Chelikani, June 2001.

“Study of Blood Flow with Single Photon Emission Computed Tomography (SPECT) in Focal Epilepsy and its Importance for the Surgical Treatment of the Disease”, MD Doctoral Dissertation submitted to School of Medicine, Athens, Greece, by Marianna Varelas-Spanaki, 1998.

“Measurement of the Acetazolamide Induced Cerebral Blood Volume and Blood Flow Responses Using Whole Brain Dynamic Enhanced Susceptibility MR Imaging” Applied Math Senior Essay by Mandeep Dagli, 1996.

“Use of Calculated Difference and Percent Difference Tc-99m HMPAO SPECT Cerebral Blood flow Images in Detecting Seizure Foci in Patients with Partial Epilepsy”, MD Thesis submitted to the Yale School of Medicine in Fulfillment of the Requirements for the Degree of Doctor of Medicine, by Khursheed Imam, 1994.

“Bayesian Reconstruction in SPECT Emission Tomography Using Gibbs Priors”, PhD Doctoral Dissertation submitted to Biomedical Engineering Yale University, Mindy MinHae Lee, 1994.

“Clinical Measurement of Glomerular Filtration Rate in Patients with Impaired Renal Function: 99m-Tc-DTPA versus Inulin Clearance” MD Thesis submitted to the Yale School of Medicine in fulfillment of the requirements for the degree of Doctor of Medicine, Darryl Scott Wong, 1989.

PUBLISHED PEER-REVIEWED MANUSCRIPTS

M. King , J. Mukherjee , A. Konik , **G. Zubal** , J. Dey , R. Licho,
“Design of a Multi-Pinhole Collimator for I-123 DaTscan Imaging on Dual-Headed SPECT Systems in Combination with a Fan-Beam Collimator”, *IEEE Transactions on Nuclear Science*, VOL. 63, No. One, February 2016

“ENPP1-Fc prevents mortality and vascular calcifications in rodent model of generalized arterial calcification of infancy.”

Albright RA, Stabach P, Cao W, Kavanagh D, Mullen I, Braddock AA, Covo MS, Tehan M, Yang G, Cheng Z, Bouchard K, Yu ZX, Thorn S, Wang X, Folta-Stogniew EJ, Negrete A, Sinusas AJ, Shiloach J, **Zubal G**, Madri JA, De La Cruz EM, Braddock DT.
Nat Commun. 2015 Dec 1;6:10006.

Kuo PH, Avery R, Krupinski E, Lei H, Bauer A, Sherman S, McMillan N, Seibyl J, **Zubal G**:
“Receiver-Operator-Characteristic Analysis of an Automated Program for Analyzing Striatal Uptake of 123I-Ioflupane SPECT images: Calibration Using Visual Reads”., *J Nucl Med.Tech*; 2013; 41:1-6.

Seibyl J, **Zubal IG**, Jennings D, Marek K, Doraiswamy PM.
"Molecular PET imaging in multicenter Alzheimer's therapeutic trials: current trends and implementation strategies.", *Expert Rev Neurother.* 2011 Dec;11(12):1783-93.

J. Seibyl, K. Marek, **G. Zubal**,
“The Role of the Core Imaging Laboratory in Multicenter Trials”, *Semin Nucl Med* (2010) Sep;40:338-346.

Blumenfeld H, Varghese GI, Purcaro MJ, Motelow JE, Enev M, McNally KA, Levin AR, Hirsch LJ, Tikofsky R, **Zubal IG**, Paige AL, Spencer SS.
“Cortical and subcortical networks in human secondarily generalized tonic-clonic seizures”
Brain. 2009 Apr;132:999-1012. Epub 2009 Apr 1.

K. Buch, S. Spencer, E Novotny, H. Blumenfeld, **I.G. Zubal**,
“Evaluating The Accuracy of Perfusion/Metabolism (SPET/PET) Ratio In Seizure Localization” *Eur J Nucl Med Mol Imaging.* 2008 Mar;35(3):579-88.

Zubal IG, Early M, Yuan O, Jennings D, Marek K, Seibyl JP.,
“Optimized, Automated Striatal Uptake Analysis Applied to SPECT Brain Scans of Parkinson's Disease Patients.”, *J Nucl Med.* 2007 Jun;48(6):857-64.

Delbeke D, Coleman RE, Guiberteau MJ, Brown ML, Royal HD, Siegel BA, Townsend DW, Berland LL, Parker JA, **Zubal G**, Cronin V
“Procedure Guideline for SPECT/CT Imaging” ; Society of Nuclear Medicine (SNM). *J Nucl Med.* 2006 Jul;47(7):1227-34.

McNally KA, Paige AL, Varghese G, Zhang H, Novotny EJ, Spencer SS, **Zubal IG**, Blumenfeld H.
“Localizing Value of Ictal-Interictal SPECT Analyzed by SPM (ISAS)”. Epilepsia, 2005 Sep;46(9):1450-64.

Chelikani S, Gore J, **Zubal G.**,
“Optimizing Compton camera geometries.”, Phys Med Biol. 2004 Apr 21;49(8):1387-408

Blumenfeld H, McNally KA, Vanderhill SD, Paige AL, Chung R, Davis K, Norden AD, Stokking R, Studholme C, Novotny EJ, **Zubal IG**, Spencer SS. .
“Positive and negative network correlations in temporal lobe epilepsy”, Cerebral Cortex, 2004, 14(8): 892-902.

Zubal G, Fujibayashi Y, Maruoka N, Omata N, Yonekura Y.,
“Automated kinetic analysis of FDG uptake in living rat brain slices from dynamic positron autoradiography”, Cancer Biother Radiopharm. 2003 Jun;18(3):405-11.

Blumenfeld H, Westerveld M, Ostroff RB, Vanderhill SD, Freeman J, Necochea A, Uranga P, Tanhehco T, Smith A, Seibyl JP, Stokking R, Studholme C, Spencer SS, **Zubal IG**,
“Selective frontal, parietal, and temporal networks in generalized seizures.”, Neuroimage. 2003 Aug;19(4):1556-66.

Stokking R, **Zubal IG**, Viergever MA.,
“Display of fused images: methods, interpretation, and diagnostic improvements.”, Semin Nucl Med. 2003 Jul;33(3):219-27.

Daube-Witherspoon ME, **Zubal IG**, Karp JS.,
“Developments in instrumentation for emission computed tomography (PET SPECT).”, Semin Nucl Med. 2003 Jan;33(1):28-41.

Blumenfeld H, McNally KA, Ostroff RB, **Zubal IG.**,
“Targeted prefrontal cortical activation with bifrontal ECT.”, Psychiatry Res. 2003 Jul 30;123(3):165-70.

Chang DJ, **Zubal IG**, Gottschalk C, Necochea A, Stokking R, Studholme C, Corsi M, Slawski J, Spencer SS, Blumenfeld H.,
"Comparison of statistical parametric mapping and SPECT difference imaging in patients with temporal lobe epilepsy." , Epilepsia 2002 Jan;43(1):68-74.

Avery RA, **Zubal IG**, Studholme C, Slawski J, Corsi M, Spencer DD, Spencer SS.,
"Interictal 99mTc-HMPAO SPECT in temporal lobe epilepsy: relation to clinical variables." , Epilepsia 2001 Jul;42(7):869-74.

Studholme C, Novotny E, **Zubal IG**, Duncan JS.,
"Estimating tissue deformation between functional images induced by intracranial electrode implantation using anatomical MRI." , Neuroimage 2001 Apr;13(4):561-76.

Zubal IG, Avery RA, Stokking R, Studholme C, Corsi M, Dey H, Seibyl JP, Spencer SS
“Ratio-images calculated from interictal positron emission tomography (PET) and single-photon emission computed tomography (SPECT) for quantification of the uncoupling of brain metabolism and perfusion in epilepsy.”, Epilepsia. 2000 Dec;41(12):1560-6.

Zubal IG, Narayanan MV, MacMullan, J, King MA,
“Scanner Correction for Camera Based Coincidence and Single Photon Imaging Protocols”,
IEEE Trans on Nuclear Sciences 2000 June, vol 47, no 3, 1222-1227.

Avery RA, **Zubal IG**, Stokking R, Studholme C, Corsi M, Seibyl JP, Spencer SS.
“Decreased cerebral blood flow during seizures with ictal SPECT injections.”, Epilepsy Res,
2000 Jun;40(1):53-61.

Avery RA, Spencer SS, Studholme C, Stokking R, Morano G, Corsi M, Seibyl JP, Spencer DD, **Zubal IG**, “Reproducibility of serial peri-ictal single-photon emission tomography difference images in epilepsy patients undergoing surgical resection.”, Eur J Nucl Med 2000 Jan;27(1):50-5.

Spanaki MV, Spencer SS, Corsi M, MacMullan J, Seibyl J, **Zubal IG**,
“The role of quantitative ictal SPECT analysis in the evaluation of nonepileptic seizures”
J Neuroimaging, 1999 Oct;9(4):210-6.

Avery RA, Spencer SS, Spanaki MV, Corsi M, Seibyl JP, **Zubal IG**,
“Effect of injection time on postictal SPET perfusion changes in medically refractory epilepsy.”, Eur J Nucl Med, 1999 Aug;26(8):830-6.

Spanaki MV, Spencer SS, Corsi M, MacMullan J, Seibyl J, **Zubal IG**,
“Sensitivity and specificity of quantitative difference SPECT analysis in seizure localization.”, J Nucl Med, 1999 May;40(5):730-6.

Spanaki MV, **Zubal IG**, MacMullan J, Spencer SS,
“Peri-ictal SPECT localization verified by simultaneous intracranial EEG.”, Epilepsia, 1999 Mar;40(3):267-74.

Zubal IG, Spanaki MV, McMullen J., Corsi M., Seibyl J.P., Spencer SS, “Influence of Tc-99m HMPAO Injection Time on Single Photon Emission Tomography (SPECT) Perfusion Changes in Epilepsy”, Eur. J. Nucl. Med., 1999 26: 12-17.

Rajeevan N, **Zubal IG.**, Ramsby S. Q, Zoghbi SS, Seibyl J, Innis R,
“Significance of Nonuniform Attenuation correction In Quantitative Brain SPECT Imaging” J Nucl Med; 1998 39:1719-1726.

Zubal IG, Spanaki MV, Spencer SS,
“Single photon emission computed tomography-EEG relations in temporal lobe epilepsy.”, Neurology, 1998 Aug;51(2):645; 646-7.

Dey HM, Daley L, Ng CK, **Zubal G**, Freedman G, Seibyl JP.,
“Detection of Pulmonary Malignancy with a Coincidence Capable Gamma Camera.
Preliminary Comparison to Traditional PET.”, Clin Positron Imaging. 1998 Sep;1(4):259.

Baron JM, **Zubal IG**, Daley L, Ng C, Dey H, Seibyl J,
“Simultaneous High Resolution Dual Isotope F18 PET and Tc99m SPECT with Cross-talk
Correction.”, Clin Positron Imaging. 1998 Sep;1(4):251.

Liu Y-H-M, Rangarajan A, Gagon D, Therrien M, Sinusas AJ, Wackers FJTh, **Zubal IG**,
“A Novel Geometry for SPECT Imaging Associated with the EM-Type Blind Deconvolution
Method”, IEEE Transactions/Journal: Nuclear Science Symposium, 1998 vol 45, issue 4,
2095-2101, (1998).

Spanaki MV, Spencer SS, Wisniewski G, McMullen J, Seibyl JP, **Zubal IG**,
“Evolution and Localization of Post-ictal Blood Flow Changes in Partial Seizures
Demonstrated by SPECT: Use of Quantitative Difference Images”, J of Epilepsy, 1998
11:25-33.

Zubal IG, Harrell CR, Smith EO, Smith AL, Krischlunas P,
“High resolution, MRI-based, Segmented, Computerized Head Phantom”, in the Sixth
International Radiopharmaceutical Dosimetry Symposium, Gatlinburg, TN, May 7-10, 1996.
A. T. S.-Stelson, MG Stabin, RB Sparks and RE Toohey, Editors. Published by Oak Ridge
Associated Universities, Vol. 1, p.319-324, (1988).

Tagesson M, **Zubal IG**, Ljungberg M, Strand SE,
“S-values for subregions in the Brain”, in the Sixth International Radiopharmaceutical
Dosimetry Symposium, Gatlinburg, TN, May 7-10, 1996. A. T. S.-Stelson, MG Stabin, RB
Sparks and RE Toohey, Editors. Published by Oak Ridge Associated Universities, Vol. 1,
p.325-330, (1998).

Heller EN, DeMan P, Liu YH, Dione DP, **Zubal IG**, Wackers FJ, Sinusas AJ,
“Extracardiac activity complicates quantitative cardiac SPECT imaging using a simultaneous
transmission-emission approach.”, J Nucl Med, 1997 Dec;38(12):1882-90.

Zubal IG, Wisniewski G.,
“Understanding Fourier space and filter selection.”, J Nucl Cardiol. 1997 May;4(3):234-43.

Bremner JD, Innis RB, Ng CK, Staib LH, Salomon RM, Bronen RA, Duncan J, Southwick
SM, Krystal JH, Rich D, **Zubal IG**, Dey H, Soufer R, Charney DS,
“Positron Emission Tomography Measurement of Cerebral Metabolic Correlates of
Yohimbine Administration in Combat-Related Posttraumatic Stress Disorder”. Arch Gen
Psychiatry. 1997 Vol 54, p246-254.

Dagli M, Caride V, Carpenter S, **Zubal IG**
“Compartmental Analysis of the Complete Dynamic Scan Data for Camera-Based
Determination of Effective Renal Plasma Flow”, J Nucl Med, 1997 Aug;38(8):1285-90.

Zubal IG, Harrell CR, Smith EO, Smith AL, Krischlunas P,
“High Resolution, MRI-based, Segmented, Computerized Head Phantom”, Sixth International Radiopharmaceutical Dosimetry Symposium, 1996 May 7-10, Gatlinburg, TN.

Wallace EA, Wisniewski G, **Zubal IG**, vanDyck CH, Pfau SE, Smith EO, Rosen MI, Sullivan MC, Woods SW, Kosten TR,
“Acute cocaine effects on absolute cerebral blood flow.”, Psychopharmacology, 1996 Nov;128(1):17-20.

Zubal IG, Harrell CR, Smith EO, Smith AL,
“Two dedicated software, voxel-based anthropomorphic (torso and head) phantoms”, Proceedings of the International Conference at the National Radiological Protection Board, Chilton UK, July 6-7, Ed: P.J. Dimbylow, p. 105-111, (1995).

Caride VJ, **Zubal IG**,
“Assessment of the Plasma Volume Product to Calculate Glomerular Filtration Rate,” J. Nucl. Med., 1995 36:1602-1604.

Zubal IG, Spencer SS, Imam K, Seibyl J, Smith EO, Wisniewski G, Hoffer PB
“Difference-Images Calculated from Ictal and Interictal Tc99m-HMPAO SPECT Scans of Epileptic Seizure Patients.” J. Nucl. Med., 1995 36(4), p. 684-689.

Krystal JH, Woods SW, Seibyl JP, vanDyck CC, Price L, **Zubal IG**, Hoffer PB, Charney DS.
“Opiate Dependence and Withdrawal: Preliminary Assessment Using Single Photon Emission Computerized Tomography (SPECT)”, Am. J. Drug Alcohol Abuse, 2005 21(1), p. 47-63.

Zubal IG, Harrell CR, Smith EO, Rattner Z, Gindi G, Hoffer PB.
“Computerized 3-Dimensional Segmented Human Anatomy”, Medical Physics, 1994 21(2), February, p. 299-302.

Lee M, Gindi G., Rangarajan A, **Zubal, IG**.
“A Continuation Method for Emission Tomography”, IEEE Transactions on Nuclear Science, 1994 Vol. 40. No. 6, December.

Dey H, Seibyl JP, Stubbs JB, Zoghbi SS, Baldwin RM, Smith EO, **Zubal IG**, Zea-Ponce Y, Olson CH, Charney DS, Hoffer PB, Innis RB.
“Human Biodistribution and Dosimetry of the SPECT Benzodiazepine Receptor Radioligand Iodine-123-Iomazenil”, J Nucl Med; 1994 Vol. 35. No. 3, p. 399-404.

Seibyl JP, Wallace E, Smith EO, Stabin M, Baldwin RM, Zoghbi SS, Zea-Ponce Y, Gao Y, Zhang WY, Neumeyer JL, **Zubal IG**, Charney DS, Hoffer PB, Innis RB.
“Whole-Body Biodistribution, Radiation Absorbed Dose and Brain SPECT Imaging with Iodine-123-β-CIT in Healthy Human Subjects,” J. Nucl. Med. 1994 May, 35(5), p. 764-770.

Dey HM, Hoffer PB, Lerner E, **Zubal IG** Setaro JF, Black HR.
“Quantitative Analysis of the Technetium-99mDTPA Captopril Renogram: Contribution of Washout Parameters to the Diagnosis of Renal Artery Stenosis”. J. Nucl. Med. 1993 ; 34:, p. 1416-1419.

Hademenos GS, King MA, Ljungberg M, **Zubal IG**, Harrell CR.
“A Scatter Correction Method for Tl201 Images: A Monte Carlo Investigation.” IEEE Transactions on Nuclear Science, 1993 Vol. 40. No. 4, August, p. 1179-1186.

Rangarajan A, Lee M, **Zubal IG**, Gindi G.
“A Continuation Method for Emission Tomography.” IEEE Nuclear & Science Symposium and Medical Imaging Conference Oct. 25-31, Orlando FL, Vol. 2, p. 1204-1207, (1992).

Zubal IG, Caride VJ,
“The 99mTc-DTPA Renal Uptake - Plasma Volume Product: A Quantitative Estimation of GFR.” J. Nucl. Med., 1992 Vol. 33 No. 9 Sept., p. 1712-1716.

Zubal IG, Harrell CH.
“Voxel based Monte Carlo Calculations of Nuclear Medicine Images and Applied Variance Reduction Techniques”. Image and Vision Computing, 1992 Vol. 10 No. 6 July/Aug., p. 342-348.

Seibyl JP, Woods SW, Zoghbi SS, Baldwin RM, Dey HM, Goddard AW, Zea-Ponce Y, **Zubal IG**, Germine M, Smith EO, Heninger GR, Charney DS, Kung HF, Alavi A, Hoffer PB, Innis RB.
“Dynamic SPECT Imaging of Dopamine D2 Receptors in Human Subjects with Iodine-123-IBZM.” J. Nucl. Med.; 1992 33:1964-1971.

Hoffer PB, **Zubal IG**.
“A Guide to SPECT Equipment for Brain Imaging”, in Brain SPECT Perfusion Imaging: Image Acquisition, Processing, Display, and Interpretation, Proceedings of Symposium held at Brookhaven National Laboratory, Oct. 8-9, p. 21-27 (1991).

Zubal IG, Tagare H, Zhang L, Duncan J.
“3-D Registration of Intermodality Medical Images”, Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, October 31 - November 3, Vol. 13, p. 293-294 (1991).

Harrell CR, **Zubal IG**.
“Effect of Variance Reduction Techniques on Monte Carlo Simulated Energy Spectra” Proceedings of the 17th Annual Northeast Bioengineering Conference, Hartford, CT, April 4-5, p. 97-98, (1991).

Lee M, Gindi G, Rangarajan A, **Zubal IG**.
“Locations of Discontinuities as Priors for Improved Bayesian Reconstructions from Projections”. Proceedings of the 17th Annual Northeast Bioengineering Conference, Hartford, CT, April 4-5, p. 98-100, (1991).

Gindi G, Lee M, Rangarajan A, **Zubal IG**.

“Bayesian Reconstruction of Functional Images using Registered Anatomical Images as Priors”. Proceedings of the XIIIth International Conference on Information Processing in Medical Imaging, Kent England, Springer Verlag, Ed: Goos and Hartmanis, July 7-12, p. 121-131, (1991).

Zubal IG, Harrell CR.

“Voxel Based Monte Carlo Calculations of Nuclear Medicine Images and Applied Variance Reduction Techniques”. Information Processing in Medical Imaging, 12th International Conference IPMI '91 Wye, UK. Springer Verlag Ed:Goos and Hartmanis, July, p. 23-33, (1991).

Woods SW, Hegeman IM, **Zubal IG**, Krystal JH, Koster K, Smith EO, Henninger GR, Hoffer PB. “Visual Stimulation Increases 99mTc HMPAO Distribution in Human Visual Cortex”, J of Nucl Med, 1991 Vol. 32 No. 2, Feb., p. 210-215.

Innis R, Zoghbi S, Johnson E, Woods S, Al-Tikriti M, Baldwin R, Seibyl J, Malison R, **Zubal IG**, Charney D, Heninger G, Hoffer P.

“SPECT imaging of the benzodiazepine receptor in non-human primate brain with [123]Ro 16-0154.” European Journal of Pharmacology 1991 Feb 7;193(2):249-52.

Zubal IG, Gindi G, Lee M, Harrell C, Smith EO,

”High Resolution Anthropomorphic Phantom for Monte Carlo Analysis of Internal Radiation Sources”. Proceedings of the 3rd Annual IEEE Symposium on Computer Based Medical System, Chapel Hill, North Carolina, June 3-6, p. 540-548, (1990).

Zubal IG, Harrell CR, Esser PD.

“Monte Carlo determination of emerging energy spectra for diagnostically realistic radiopharmaceutical distributions”. Nuclear Instruments and Methods in Physics Research, 1990 A299, p. 544-547.

Chen CC, Hoffer PB, Vahjen G, Gottschalk A, Koster K, **Zubal IG**, Setaro JF, Roer DA, Black HR.

“Patients at High Risk for Renal Artery Stenosis; A simple method of renal scintigraphic analysis with Tc-99m DTPA and Captopril.” Radiology 1990 Aug 176(2):365-70.

Woods SW, Koster K, Krystal JK, Smith EO, **Zubal IG**, Hoffer PB, Charney DS,

“Yohimbine Alters Regional Cerebral Blood Flow in Panic Disorder.” The Lancet, 1998 September 17, p. 678-679.

Cinnotti L, Susskind H, **Zubal IG**, Meignan M, Brill AB.

“Kr-81m Traces Lung Volume in Gated Scans” Nucl Med Commun. 1986 25:, p. 125-156.

Cinnotti L, Susskind H, **Zubal IG**, Meignan M, Bennett G, Slosman D, Brill AB,

“Measurement of Lung Volume with Kr-81m in a dynamic scintigram” Nucl Med Commun, 1987 Jul 8(7), p. 479-488.

Cinnotti L, Meignan M, **Zubal IG**, Bazin JP, DiPaola R, Brill AB.
“Factor Analysis Imaging in Kr-81m Gated Lung Scans.” Proceedings of 37th Annual Conference on Engineering in Medicine and Biology, Vol. 26, Sept. 17-19, p. 131-136, (1984).

Bizais Y, **Zubal IG**, Rowe R, Bennett G, and Brill AB.
“Dual Seven Pin Hole Tomography.” Proc. of the 1982 IEEE Nuclear Science Symposium, Washington, DC., Oct. 20-22, (1982).

Bizais Y, Rowe R, **Zubal IG**, Bennett G, and Brill AB.
“A New Approach to 2D Linear Interpolation for Geometric Distortion Correction of Images.” Proc. of the First IEEE Computer Soc. Int'l. Conf. on Medical Computer Science, Philadelphia, Sept., IEEE Computer Soc. Press, Los Angeles, p. 170-174, (1982).

Bennett G, Brill AB, **Zubal IG**, Rowe RW, Bizais Y.
“UNICON, A Single Instrument for PET, SPECT, and Routine Clinical Imaging.”, Proc. of the World Congress on Medical Physics and Biomedical Engineering, Hamburg, W. Germany, Sept. MPBE Press, Hamburg, p. 21-28, (1982).

Kiszenick W, Fairchild RG, Slatkin DN, **Zubal IG**
“Increased neutron penetration in partially deuterated water: Application to neutron capture therapy.” Med. Phys. 1984 11(1) Jan./Feb., p. 26-30.

Zubal IG, Bennett G, Bizais Y, Brander W, and Brill AB.
“Dual Gated Nuclear Medicine Cardiac Images.” IEEE Transaction on Nuclear Science, San Francisco, Oct. 19-21, p. 566-569, (1983).

Zubal IG, Bizais Y, Susskind H, Bennett G, and Brill AB.
“Fourier Processed Images of Dynamic Lung Function.” Proceedings Fifth Annual Conference on Frontiers of Engineering and Computing in Health Care, Columbus, Ohio, Sept. 10-12, p. 504-508, (1983).

Zubal IG, Bizais YJC, Bennett GW, and Brill AB.
“Software Programmable Multi-Mode Interface for Nuclear Medicine Imaging.” Proc. of the First IEEE Computer Society Int'l. Conference on Medical Computer Science, Philadelphia, PA. Sept. 1982, IEEE Computer Society Press, Los Angeles, p. 92-96, (1982).

Zubal IG

“Characteristics of the Scatter Dose and Calculation of Total Dose of Fast Neutrons for External Beam Therapy.”, (in German), Ph.D. Dissertation, Department of Bio-Physics, The University of Saarbruecken, Saarland, West Germany, (1981).

Zubal IG

“The Fabrication and Analysis of Orthogonal Strip High Purity Germanium Detectors for Nuclear Medicine Imaging,” M.Sc. Thesis, Department of Nuclear Engineering and Instrumentation. The Ohio State University, Columbus, Ohio, (1974).

BOOKS , CHAPTERS AND REVIEWS

“From the Exhibitors’ Hall”, J Nucl Med, Newsline
JNM 53(8), 11N-17N, August 2012.
JNM 54(9), 17N-19N, September 2013.
JNM 55(10),16N-18N, October 2014.

Chapter “Epilepsy Localization: Ictal and Interictal SPECT” in Functional Cerebral SPECT and PET Imaging, Lippincott, 2010.

21 chapters: “Physics, Instrumentation and Health Physics” Chapters in Yearbook of Nuclear Medicine, Mosby, years: 1988-2001.

"Merging the instrumentation evolution.", J Nucl Med 2001 Apr;42(4):633-5.

“Anthropomorphic Phantoms” in Monte Carlo Calculations in Nuclear Medicine,
Ed: M Ljungberg, Institute of Physics Publishing, 1998.

“Understanding Fourier Space and Filter Selection”, J. of Nuclear Cardiology, 1997
May/June, p.234-243.

“The Evolution of Imaging Devices: A Constant Challenge with Continuing Progress”, JL Quinn and PB Hoffer Editor's Essay in The Yearbook of Nuclear Medicine, Ed: A. Gottschalk, 1996.