CURRICULUM VITAE

Date of Revision: June 14, 2019
Name: Yi-Hwa Liu, PhD
School: Yale School of Medicine

Education:

BS, Chung Yuan Christian University, Chung-Li, Taiwan Biomedical Engineering 1981
MS, University of Missouri, Columbia, Missouri Electrical and Computer Engineering 1987
PhD, Rensselaer Polytechnic Institute Electrical, Computer and System Engineering 1991

Career/Academic Appointments:

1991 - 1993	Post-Doctoral Fellow, Pharmacology, Georgetown University School of Medicine, Washington, DC
1993 - 1995	Postdoctoral Associate, Cardiology (Medicine), Yale School of Medicine, New Haven, CT
1995 - 1998	Associate Research Scientist, Cardiology (Medicine), Yale School of Medicine, New Haven, CT
1998 - 2004	Assistant Professor, Cardiology (Medicine), Yale School of Medicine, New Haven, CT
2004 - 2014	Associate Professor on Term, Cardiology (Medicine), Yale School of Medicine, New Haven, CT
2014 - present	Senior Research Scientist, Cardiology (Medicine), Yale School of Medicine, New Haven, CT
2014 - present	Senior Research Scientist, Internal Medicine, Yale School of Medicine, New Haven, CT

Administrative Positions:

2017 - present	Associate Director of Cardiovascular Nuclear Imaging Core Laboratory, Internal Medicine (Cardiovascular Medicine), Yale School of Medicine, New Haven, CT

Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated With Yale:

International/National

2018: Global Conference on Biomedical Engineering (GCBME), Taipei, Taiwan. "New quantification methods for planar and SPECT equilibrium radionuclide angiocardiography (ERNA)"
2018: Emerging Technologies Conference, Whistler, BC, Canada. "Near-Field coded aperture imaging: potential for high-sensitivity and high-resolution SPECT"
2017: Department of Biomedical Engineering, Chung Yuan Christian University, Taipei, Taiwan. "Iodine-123-MIBG Nuclear Cardiac Imaging and Quantitative Assessment of Myocardial Sympathetic Innervation for Prediction of Life-threatening Cardiac Events"

2017: Department of Nuclear Medicine, Veteran General Hospital, Taipei, Taiwan. "Iodine-123-MIBG NInuclear Cardiac Imaging and Quantitative Assessment of Myocardial Sympathetic Innervation for Prediction of Life-threatening Cardiac Events"

2016: Department of Biomedical Engineering, National Yang-Ming University, Taipei, Taiwan. "Iodine-123-MIBG Nuclear Cardiac Imaging and Quantitative Assessment of Myocardial Sympathetic Innervation for Prediction of Life-threatening Cardiac Events"

2016: Department of Biomedical Engineering, National Cheng Kung University, Tainan, Tainan City, Taiwan. "Iodine-123-MIBG Nuclear Cardiac Imaging and Quantitative Assessment of Myocardial Sympathetic Innervation for Prediction of Life-threatening Cardiac Events"

2014: Department of Biomedical Imaging & Radiological Sciences, National Yang-Ming University, Taipei, Taiwan. "Near-field Coded Aperture Imaging Technology and EM-based 2-D and 3-D SPECT Reconstruction Methods"

2014: Department of Biomedical Engineering, National Yang-Ming University, Taipei, Taiwan. "Molecularly Targeted SPECT Imaging and Absolute Quantification of Myocardial Focal Tracer Uptake"

2013: Department of Biomedical Imaging & Radiological Sciences, National Yang-Ming University, Taipei, Taiwan, Taipei, Taiwan. "Department of Biomedical Imaging & Radiological Sciences, National Yang-Ming University, Taipei, Taiwan"

2013: Department of Biomedical Engineering, Chung Yuan Christian University, Chung-Li, Taiwan, Taipei, Taiwan. "SPECT Quantification of Abnormalities of Myocardial Perfusion and Left Ventricular Function"

2013: Department of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan, Tainan, Tainan City, Taiwan. "SPECT Quantification of Abnormalities of Myocardial Perfusion and Left Ventricular Function"

2011: Department of Biomedical Engineering, Chung Yuan Christian University, Chung-Li, Taiwan, Taipei, Taiwan. "Quantification of Myocardial Focal Tracer Uptake from Molecular Targeted SPECT Imaging"

2010: MD Anderson Medical Center, University of Texas, Houston, TX, Houston, TX. "Quantification of SPECT and PET Imaging"

Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated With Yale:

International/National

2018: IEEE Nuclear Science and Medical Imaging Conference, Sydney, NSW, Australia. "A new approach to automatic extraction of the time activity curve with partial volume correction for dynamic 82Rb cardiac PET"

2018: IEEE Nuclear Science and Medical Imaging Conference, Sydney, NSW, Australia. "New method for quantification of the left ventricular function from low-dose equilibrium radionuclide angiocardiography: comparisons with conventional methods in patients"

2016: American College of Cardiology (ACC), Chicago, IL. "Normal limits of heart-to-mediastinum ratio (HMR) of I-123 MIBG uptake quantified from high sensitivity (HS) and high-resolution (HR) SPECT/CT"

2015: International Conference on Nuclear Cardiology and Cardiac CT (ICNC), Madrid, Community of Madrid, Spain. "Planar versus SPECT quantification of the heart-to-mediastinum ratio from I-123-MIBG sympathetic cardiac SPECT imaging: accuracy as assessed by computer simulations"

2014: International Conference on Clinical & Experimental Cardiology, San Antonio, TX. "Current Research in Cardiology"

2010: Society of Nuclear Medicine, Salt Lake City, UT. "Quantification of normal pattern of regional myocardial uptake of 18F LMI1195, a novel tracer for imaging myocardial sympathetic function: First-in-human study"

2006: Annual Conference of American Society of Nuclear Cardiology (ASNC), Montreal, QC, Canada. "Increasing Role of Quantification in Clinical Nuclear Cardiology: The Yale Approach"

2006: Annual Conference of Society of Nuclear Medicine (SNM), San Diego, CA. "Quantification of Targeted Images"

Professional Service:

Peer Review Groups/Grant Study Sections

2019	Co-Ad Hoc Reviewer, Ministry of Science, Technology and Space, Jerusalem, Israel
2009	Co-Ad Hoc Reviewer, National Institute of Diabetes and Digestive and Kidney Disease Special Emphasis Panel, National Institutes of Health (NIH)
2004 - present	Committee Member, National American Heart Association (AHA)

Journal Service

Editor/Associate Editor

2017 - present	Editor, Journal of Radiology and Diagnostic Imaging
2012 - 2016	Associate Editor, Current Molecular Imaging Journal
2009 - present	Associate Editor, Medical Physics, AAPM, College Park, MD
2009 - present	Associate Editor, World Journal of Cardiology

Professional Service for Professional Organizations

Department of Biomedical Engineering, Chung Yuan Christian University, Taoyuan, Taiwan

2016 - present	Adjunct Professor, Department of Biomedical Engineering, Chung Yuan Christian University, Taoyuan, Taiwan

Meeting Planning/Participation

2018	Chairperson, Advanced Materials, Emerging Technologies Conference, Whistler, BC, Canada
2017	Presenter/Speaker, Department of Biomedical Engineering, National Cheng Kung University, Tainan, Taiwan
2016	Adjunct Professor, Department of Biomedical Engineering, Chung Yuan Christian University, Taoyuan, Taiwan

2015 Adjunct Professor, Department of Biomedical Imaging and Radiological Sciences, School of Biomedical Science and Engineering, National Yang-Ming University, Taipei, Taiwan

2014 Presenter/Speaker, Department of Biomedical Engineering, Chung Yuan Christian University, Chung-Li, Taiwan

Yale University Service

Medical School Committees

2015 - present Council Member, Faculty Advisory Council to the Dean of Yale School of Medicine

Public Service

2016 - present Founder, Voxelon Inc., Watertown, CT

Bibliography:

Peer-Reviewed Original Research

1. Shi CQ, Young LH, Daher E, DiBella EV, **Liu YH**, Heller EN, Zoghbi S, Wackers FJ, Soufer R, Sinusas AJ. Correlation of myocardial p-(123)I-iodophenylpentadecanoic acid retention with (18)F-FDG accumulation during experimental low-flow ischemia. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2002, 43:421-31.
2. **Liu YH**, Lam PT, Sinusas AJ, Wackers FJ. Differential effect of 180 degrees and 360 degrees acquisition orbits on the accuracy of SPECT imaging: quantitative evaluation in phantoms. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2002, 43:1115-24.
3. Navare SM, Wackers FJ, **Liu YH**. Comparison of 16-frame and 8-frame gated SPET imaging for determination of left ventricular volumes and ejection fraction. European Journal Of Nuclear Medicine And Molecular Imaging 2003, 30:1330-7.
4. Samady H, **Liu YH**, Choi CJ, Ragosta M, Pfau SE, Cleman MW, Powers ER, Kramer CM, Wackers FJ, Beller GA, Watson DD. Electromechanical mapping for detecting myocardial viability and ischemia in patients with severe ischemic cardiomyopathy. The American Journal Of Cardiology 2003, 91:807-11.
5. Li S, Dobrucki LW, Sinusas AJ, **Liu YH**. A new method for SPECT quantification of targeted radiotracers uptake in the myocardium. Medical Image Computing And Computer-assisted Intervention : MICCAI ... International Conference On Medical Image Computing And Computer-Assisted Intervention 2005, 8:684-91.
6. **Liu YH**, Sinusas AJ, Khaimov D, Gebuza BI, Wackers FJ. New hybrid count- and geometry-based method for quantification of left ventricular volumes and ejection fraction from ECG-gated SPECT: methodology and validation. Journal Of Nuclear Cardiology : Official Publication Of The American Society Of Nuclear Cardiology 2005, 12:55-65.
7. Masood Y, **Liu YH**, Depuey G, Taillefer R, Araujo LI, Allen S, Delbeke D, Anstett F, Peretz A, Zito MJ, Tsatkin V, Wackers FJ. Clinical validation of SPECT attenuation correction using x-ray computed tomography-derived attenuation maps: multicenter clinical trial with angiographic correlation. Journal Of Nuclear Cardiology : Official Publication Of The American Society Of Nuclear Cardiology 2005, 12:676-86.

8. **Liu YH**, Fernando GP, Sinusas AJ. A new method for hot-spot quantification of hybrid SPECT/CT cardiac images: methodology and preliminary phantom validation. IEEE Trans Nucl Sci 200653:2814-2821.
9. Mu Z, **Liu YH**. Aperture collimation correction and maximum-likelihood image reconstruction for near-field coded aperture imaging of single photon emission computerized tomography. IEEE Transactions On Medical Imaging 2006, 25:701-11.
10. Abbott BG, **Liu YH**, Arrighi JA. [18F]Fluorodeoxyglucose as a memory marker of transient myocardial ischaemia. Nuclear Medicine Communications 2007, 28:89-94.
11. **Liu YH**. Quantification of nuclear cardiac images: the Yale approach. Journal Of Nuclear Cardiology : Official Publication Of The American Society Of Nuclear Cardiology 2007, 14:483-91.
12. Ryder WJ, Brennan MP, Sinusas AJ, **Liu YH**. Iterative reconstruction of multi-pinhole SPECT. Proceedings of the SPIE 20081613:69132M1-10.
13. **Liu YH**, Sahul Z, Weyman CA, Ryder WJ, Dione D, Dobrucki LW, Mekkaoui C, Brennan MP, Hu X, Hawley C, Sinusas AJ. Hotspot quantification of myocardial focal tracer uptake from molecular targeted SPECT/CT images: canine validation. Proceedings of the SPIE 20086915:69150N1-8.
14. Mu Z, Hong B, Li S, **Liu YH**. A novel three-dimensional image reconstruction method for near-field coded aperture single photon emission computerized tomography. Medical Physics 2009, 36:1533-42.
15. **Liu YH**, Sahul Z, Weyman CA, Dione DP, Dobrucki WL, Mekkaoui C, Brennan MP, Ryder WJ, Sinusas AJ. Accuracy and reproducibility of absolute quantification of myocardial focal tracer uptake from molecularly targeted SPECT/CT: a canine validation. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2011, 52:453-60.
16. Li S, Sinusas AJ, Dobrucki LW, **Liu YH**. New approach to quantification of molecularly targeted radiotracer uptake from hybrid cardiac SPECT/CT: methodology and validation. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2013, 54:2175-81.
17. Jovin IS, Ebisu K, **Liu YH**, Finta LA, Oprea AD, Brandt CA, Dziura J, Wackers FJ. Left ventricular ejection fraction and left ventricular end-diastolic volume in patients with diastolic dysfunction. Congestive Heart Failure (Greenwich, Conn.) 2013, 19:130-4.
18. Chan C, Harris M, Le M, Biondi J, Grobshtein Y, **Liu YH**, Sinusas AJ, Liu C. End-expiration respiratory gating for a high-resolution stationary cardiac SPECT system. Physics In Medicine And Biology 2014, 59:6267-87.
19. Sinusas AJ, Lazewatsky J, Brunetti J, Heller G, Srivastava A, **Liu YH**, Sparks R, Puretskiy A, Lin SF, Crane P, Carson RE, Lee LV. Biodistribution and radiation dosimetry of LMI1195: first-in-human study of a novel 18F-labeled tracer for imaging myocardial innervation. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2014, 55:1445-51.
20. Mu Z, Dobrucki LW, **Liu YH**. SPECT Imaging of 2-D and 3-D Distributed Sources with Near-Field Coded Aperture Collimation: Computer Simulation and Real Data Validation. Journal Of Medical And Biological Engineering 2016, 36:32-43.
21. Wu J, Lin SF, Gallezot JD, Chan C, Prasad R, Thorn S, Stacy MR, Huang H, Zonouz TH, **Liu YH**, Lampert RJ, Carson RE, Sinusas AJ, Liu C. Quantitative Analysis of Dynamic 123I-mIBG SPECT Imaging Data in Healthy Humans with a Population-Based Metabolite Correction Method. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2016, 57:1226-32.
22. Palyo R, Sinusas A, **Liu YH**. High-Sensitivity and High-Resolution SPECT/CT Systems Provide Substantial Dose Reduction Without Compromising Quantitative Precision for Assessment of

Myocardial Perfusion and Function. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2016, 57:893-9.

23. Chan C, Dey J, Grobshtein Y, Wu J, **Liu YH**, Lampert R, Sinusas AJ, Liu C. The impact of system matrix dimension on small FOV SPECT reconstruction with truncated projections. Medical Physics 2016, 43:213.
24. Wu J, Liu H, Hashemi Zonouz T, Sandoval VM, Mohy-Ud-Din H, Lampert RJ, Sinusas AJ, Liu C, **Liu YH**. A blind deconvolution method incorporated with anatomical-based filtering for partial volume correction: Validations with 123 I-mIBG cardiac SPECT/CT. Medical Physics 2017, 44:6435-6446.
25. Wu J, Gallezot JD, Lu Y, Ye Q, Liu H, Esserman DA, Kyriakides TC, Thorn S, Hashemi Zonouz T, **Liu YH**, Lampert R, Sinusas AJ, Carson RE, Liu C. Simplified Quantification and Acquisition Protocol for 123I-MIBG Dynamic SPECT. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2018, 59:1574-1580.
26. Alvi R, Miller EJ, Hashemi Zonouz T, Sandoval V, Tariq N, Lampert R, Sinusas AJ, **Liu YH**. Quantification and Determination of Normal 123I-Meta Iodobenzylguanidine Heart-to-Mediastinum Ratio (HMR) from Cardiac SPECT/CT and Correlation with Planar HMR. Journal Of Nuclear Medicine : Official Publication, Society Of Nuclear Medicine 2018, 59:652-658.
27. Sun JY, Yun CH, Mok GSP, **Liu YH**, Hung CL, Wu TH, Alaiti MA, Eck BL, Fares A, Bezerra HG. Left Atrium Wall-mapping Application for Wall Thickness Visualisation. Scientific Reports 2018, 8:4169.
28. Feher A, Srivastava A, Quail MA, Boutagy NE, Khanna P, Wilson L, Miller EJ, **Liu YH**, Lee F, Sinusas AJ. Serial Assessment of Coronary Flow Reserve by Rubidium-82 Positron Emission Tomography Predicts Mortality in Heart Transplant Recipients. JACC. Cardiovascular Imaging 2018.
29. Hashemi-Zonouz T, Wu J, Sandoval V, Allahverdi SH, Fazzone-Chettiar R, **Liu Y**-H. A new approach to quantification of end-diastolic volume and ejection fraction from SPECT equilibrium radionuclide angiocardiography: methodology and phantom validation. J Med Biol Eng 2019; 39:393-402.

Chapters, Books, and Reviews

30. Yi-Hwa Liu and Frans J.Th Wackers, CRC Press, Taylor & Francis Group, London, UK, 2011(ISBN: 978-1-84076-109-2).
31. Yi-Hwa Liu and Albert J. Sinusas, CRC Press, Taylor & Francis Group, London, UK, 2017 (ISBN: 978-1-4665-9537-8).