Curriculum Vitae

Name: **Lien-Hsin Hu**

Affiliated Appointments

Aug. 1, 2017- Attending physician
Department of Nuclear Medicine, Taipei Veterans General Hospital

Jan.1, 2022- Associate professor
School of Medicine, National Yang Ming Chiao Tung University, Taipei 112, Taiwan

Education

1999 – 2006 M.D. Tzu-Chi University, Hua-Lien, Taiwan

Postgraduate Training

Apr. 1, 2010 – Jun. 30, 2013 Resident
Department of Nuclear Medicine, Taipei Veterans General Hospital

Jul. 1, 2013 – Aug. 15, 2016 Chief Resident
Department of Nuclear Medicine, Taipei Veterans General Hospital

Aug. 16, 2016 – Jul. 31, 2017 Fellow
Department of Nuclear Medicine, Taipei Veterans General Hospital

Sep. 25, 2017 – Jul. 29, 2019 Postdoctoral scientist
Cedars-Sinai Medical Center, Los Angeles, California, U.S.A

Aug. 1, 2017 – Attending physician
Department of Nuclear Medicine, Taipei Veterans General Hospital

Jan. 1, 2022 – Assistant Professor
National Yang Ming Chiao Tung University

Professional Specialty

2014 – Specialist, Society of Nuclear Medicine, Taiwan (R.O.C)

Research Interests

1. Nuclear cardiology
2. PET
3. Establishment of normal database in nuclear medicine images

HONORS AND SPECIAL AWARDS

1. 臺北榮民總醫院 104 年 臨床教學績優醫師獎 (退輔會)
2. 陽明大學醫學系 110 年第二學期優良教師 (陽明大學醫學系)
3. 臺北榮民總醫院 110 年 09 月 病歷優良醫師 (教學部)
4. 臺北榮民總醫院 111 年 臨床教學績優醫師獎 (臺北榮總)
5. 中華民國核醫學學會 2022 年年會 口頭論文臨床組 優異 (中華民國核醫學學會)

Publication

2022

1. Balaji K Tamarappoo, Yuka Otaki, Tali Sharir, **Lien-Hsin Hu**, Heidi Gransar, Andrew J Einstein, Mathews B Fish, Terrence D Ruddy, Philipp Kaufmann, Albert J Sinusas, Edward J Miller, Timothy M Bateman, Sharmila Dorbala, Marcelo Di Carli, Evann Eisenberg, Joanna X Liang, Damini Dey, Daniel S Berman, Piotr J Slomka. **Differences in Prognostic Value of Myocardial Perfusion SPECT using High-Efficiency Solid-State Detector Between Men and Women in a Large International Multi-Center Study.** Circ Cardiovasc Imaging. 2022 Jun;15(6):e012741. IF 7.792 in 2020, 9/133=6.77/93.61% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. {SCI}

2021

2. Richard Rios, Robert JH Miller, **Lien-Hsin Hu**, Yuka Otaki, Ananya Singh, Marcio Diniz, Tali Sharir, Andrew J. Einstein, Mathews B. Fish, Terrence D. Ruddy, Philipp A. Kaufmann, Albert J. Sinusas, Edward J. Miller, Timothy M. Bateman, Sharmila Dorbala, Marcelo Di Carli, Serge Van Kriekinge, Paul Kavanagh, Tejas Parekh, Joanna X. Liang, Damini Dey, Daniel S. Berman, Piotr Slomka. **Determining a Minimum Set of Variables for Machine Learning Cardiovascular Event Prediction: results from REFINE SPECT registry.** *Cardiovascular Research.* 2021 Jul 14; cvab236 doi: 10.1093/cvr/cvab236. IF 10.787 in 2020, 12/142=8.45/91.55% in CARDIAC & CARDIOVASCULAR SYSTEMS. Online ahead of print. **{SCI}**

3. Evann Eisenberg, Robert JH Miller, **Lien-Hsin Hu**, Richard Rios, Julian Betancur, Peyman Azadani, Donghee Han, Tali Sharir, Andrew J. Einstein, Sabahat Bokhari, Mathews B. Fish, Terrence D. Ruddy, Philipp A. Kaufmann, Albert J. Sinusas, Edward J. Miller, Timothy, M. Bateman, Sharmila Dorbala, Marcelo Di Carli,

Joanna X. Liang, Yuka Otaki, Balaji K. Tamarappoo, Damini Dey, Daniel S. Berman, Piotr J. Slomka. **Diagnostic safety of a machine learning-based automatic patient selection algorithm for stress-only myocardial perfusion SPECT.** *J Nucl Cardiol.* 2021 Jul 6. doi: 10.1007/s12350-021-02698-4. IF 5.952 in 2020, 17/133=12.78/87.22% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. Online ahead of print. **{SCI}**

4. Keiichiro Kuronuma, Robert J.H. Miller, Yuka Otaki, Serge D. Van Kriekinge, Marcio A. Diniz, Tali Sharir, **Lien-Hsin Hu**, Heidi Gransar, Joanna X. Liang, Tejas Parekh Paul Kavanagh, Andrew J. Einstein, Mathews B. Fish, Terrence D. Ruddy, MD, Philipp A. Kaufmann, Albert J. Sinusas, Edward J. Miller, Timothy M. Bateman, Sharmila Dorbala, Marcelo Di Carli, Balaji K. Tamarappoo, Damini Dey, Daniel S Berman, Piotr J. Slomka. **Prognostic Value of Phase Analysis for Predicting Adverse Cardiac Events beyond Conventional SPECT Variables: Results from the REFINE SPECT Registry.** *Circulation: Cardiovascular Imaging.* 2021 Jul;14(7):e012386. IF 7.792 in 2020, 9/133=6.77/93.61% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING **{SCI}**
5. Azadani PN, Robert JH Miller, Sharir T, Diniz MA, **Hu LH**, Otaki Y, Gransar H, Liang JX, Eisenberg E, Einstein AJ, Fish MB, Ruddy TD, Kaufmann PA, Sinusas AJ, Miller EJ, Bateman TM, Dorbala S, Di Carli M, Balaji K Tamarappoo BK, Dey D, Berman DS, Slomka PJ. **Impact of Early Revascularization on Major Adverse Cardiovascular Events in Relation to Automatically Quantified Ischemia.** *JACC Cardiovasc Imaging.* 2021 Mar;14(3):644-653. IF 14.805 in 2020, 1/133=0.75/99.62% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING **{SCI}**
6. **Lien-Hsin Hu**, Robert J. H. Miller, Tali Sharir, Frederic Commandeur, Richard Rios Patino, Andrew J. Einstein, Mathews B. Fish, Terrence D. Ruddy, Philipp A. Kaufmann, Albert J. Sinusas, Edward J. Miller, Timothy M. Bateman, Sharmila Dorbala, Marcelo Di Carli, Joanna X. Liang, Evann Eisenberg, Damini Dey, Daniel S. Berman, Piotr J. Slomka. **Prognostically safe stress-only SPECT myocardial perfusion imaging guided by machine learning: report from REFINE SPECT.** *Eur Heart J Cardiovasc Imaging.* 2021 May 10;22(6):705-714. IF 6.875 in 2020, 12/133=9.02/91.35% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING **(First author) {SCI}**

Founding: R01HL089765 from the National Heart, Lung, and Blood Institute/National Institutes of Health (NHLBI/NIH) (PI: Piotr Slomka); Taipei Veterans General Hospital-National Yang-Ming University Excellent Physician Scientists Cultivation Program, No. 108-V-A-004

2020

7. Donghee Han, Alan Rozanski, Heidi Gransar, Tali Sharir, Andrew J. Einstein, Mathews B. Fish, Terrence D. Ruddy, Philipp A. Kaufmann, Albert J. Sinusas, Edward J. Miller, Timothy M. Bateman, Sharmila Dorbala, Marcelo Di Carli, Joanna X. Liang, **Lien-Hsin Hu**, Guido Germano, Damini Dey, Daniel S. Berman, Piotr J. Slomka. **Myocardial Ischemic Burden and Differences in Prognosis Among Patients With and Without Diabetes: Results From the Multicenter International REFINE SPECT Registry.** *Diabetes Care.* 2020 Feb;43(2):453-459. IF 16.019 in 2019, 4/143=2.80/97.55% in ENDOCRINOLOGY & METABOLISM **{SCI}**
8. **Hu LH**, Betancur J, Sharir T, Einstein AJ, Bokhari S, Fish MB, Ruddy TD, Kaufmann PA, Sinusas AJ, Miller EJ, Bateman TM, Dorbala S, Di Carli M, Germano G, Commandeur F, Liang JX, Otaki Y, Tamarappoo BK, Dey D, Berman DS, Slomka PJ. **Machine learning predicts per-vessel early coronary revascularization after fast myocardial perfusion SPECT: results from multicentre REFINE SPECT registry.** *Eur Heart J Cardiovasc Imaging.* 2020 May 1;21(5):549-559. IF 4.481 in 2019, 18/134=13.43/86.94% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **(First author) {SCI}**
9. Miller RJH, **Hu LH**, Gransar H, Betancur J, Eisenberg E, Otaki Y, Sharir T, Fish MB, Ruddy TD, Dorbala S, Carli MD, Einstein AJ, Kaufmann PA, Sinusas AJ, Miller EJ, Bateman T, Germano G, Tamarappoo BK, Dey D, Berman DS, Slomka PJ. **Transient ischaemic dilation and post-stress wall motion abnormality increase risk in patients with less than moderate ischaemia: analysis of the REFINE SPECT registry.** *Eur Heart J Cardiovasc Imaging.* 2020 May 1;21(5):567-575. IF 4.481 in 2019, 18/134=13.43/86.94% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **{SCI}**
10. **Hu LH**, Sharir T, Miller RJH, Einstein AJ, Fish MB, Ruddy TD, Dorbala S, Di Carli M, Kaufmann PA, Sinusas AJ, Miller EJ, Bateman TM, Betancur J, Germano G, Liang JX, Commandeur F, Azadani PN, Gransar H, Otaki Y, Tamarappoo BK, Dey D, Berman DS, Slomka PJ. **Upper reference limits of transient ischemic dilation ratio for different protocols on new-generation cadmium zinc telluride cameras: A report from REFINE SPECT registry.** *J Nucl Cardiol.* 2020 Aug;27(4):1180-1189. IF 3.366 in 2019, 32/134=23.88/76.12% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **(First author) {SCI}**
11. Otaki Y, Betancur J, Sharir T, **Hu LH**, Gransar H, Liang JX, Azadani PN, Einstein AJ, Fish MB, Ruddy TD, Kaufmann PA, Sinusas AJ, Miller EJ, Bateman TM, Dorbala S, Di Carli M, Tamarappoo BK, Germano G, Dey D, Berman DS, Slomka

PJ. **5-Year Prognostic Value of Quantitative Versus Visual MPI in Subtle Perfusion Defects: Results from REFINE SPECT.** *JACC: Cardiovascular Imaging.* 2020 Mar;13(3):774-785. IF 12.740 in 2019, 1/134=0.746/99.63% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **{SCI}**

12. Chang, Chih-Yung; Hung, Guang-Uei; Hsu, Bailing; Yang, Bang-Hung; Chang, Chi-Wei; **Hu, Lien-Hsin**; Huang, Wen-Sheng; Wang, Hsin-Ell; Wu, Tao-Cheng; Liu, Ren-Shyan. **Simplified quantification of 13 N-ammonia PET myocardial blood flow: A comparative study with the standard compartment model to facilitate clinical use.** *J Nucl Card.* Epub 2018 Oct 15, 2020 Jun;27(3):819-828. IF 3.366 in 2019, 32/134=23.88/76.12% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **{SCI}**
13. Betancur JA, **Hu LH**, Commandeur F, Sharir T, Einstein AJ, Fish MB, Ruddy TD, Kaufmann P, Sinusas AJ, Miller EJ, Bateman TM, Dorbala S, Di Carli M, Germano G, Otaki Y, Liang JX, Tamarappoo BK, Dey D, Berman DS, Slomka PJ. **Deep Learning Analysis of Upright-Supine High-Efficiency SPECT Myocardial Perfusion Imaging for Prediction of Obstructive Coronary Artery Disease: A Multicenter Study.** *J Nucl Med.* 2019 May;60(5):664-670. IF 7.887 in 2019, 4/134=2.99/97.39% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **{SCI}**
14. Slomka PJ, Betancur J, Liang JX, Otaki Y, **Hu LH**, Sharir T, Dorbala S, Di Carli M., Fish MB, Ruddy TD, Bateman TM, Einstein AJ, Kaufmann PA, Miller EJ, Sinusas AJ, Azadani PN, Gransar H, Tamarappoo BK, Dey D, Berman DS, Germano G. **Rationale and design of the REgistry of Fast Myocardial Perfusion Imaging with NExt generation SPECT (REFINE SPECT).** *J Nucl Cardiol.* 2020 Jun;27(3):1010-1021. IF 3.366 in 2019, 32/134=23.88/76.12% in RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING. **{SCI}**

2019

15. 胡蓮欣, 黃文盛, 吳良治. AI 大時代：從人工智慧在核醫心臟學的應用預見 AI 在醫療領域之變革. 臨床醫學. 2019 Dec;84(6):783-793
16. Slomka PJ, Miller RJH, **Hu LH**, Germano G, Berman DS. Solid-State Detector SPECT myocardial perfusion imaging. *Journal of Nucl Med.* 2019 Sep;60(9):1194-1204. **{SCI}**

Before 2018

17. **Hu LH**, Wu LC, Lee CY, Lin KH, Chu LS, Liu RS, Huang WS, Chang CP. A practical background correction method for an immediately repeated first-pass radionuclide angiography. J Chin Medi Assoc. 2018, Apr;81(4):331-339. **(First author) {SCI}**
18. 許百靈, 胡蓮欣, 黃文盛. 核醫心肌血流定量檢查. 臨床醫學. 2017

Dec;80(6):693-697

19. Hsu B, **Hu LH**, Yang BH, Chen LC, Chen YK, Ting CH, Hung GU, Huang WS, Wu TC. SPECT myocardial blood flow quantitation toward clinical use: a comparative study with (13)N-Ammonia PET myocardial blood flow quantitation. *Eur J Nucl Med Mol Imaging.* 2017;44:117-128. **{SCI}**
20. **Hu LH**, Lee CY, T CH, Wu LC, Liu RS. Persistent Left Superior Vena Cava Demonstrated by First-Pass Radionuclide Angiography. *Clin Nucl Med.* 2016 Feb;41(2):e98-100. **(First author) {SCI}**
21. 胡蓮欣, 張承培. 淋巴瘤治療反應評估標準：正子造影之角色與影像判讀標準. *臺北榮總臨床醫學雜誌*. 2013;71:106-111. **(First author)**
22. Chu YK, **Hu LH**. Waders sign on bone scan: a manifestation of portal hypertension. *Clin Nucl Med*. 2012 Apr;37(4):385-6. **{SCI}**
23. **Hu LH**, Wang SJ, Liu RS. Hyperprolactinemia-related 131I Uptake in Nonlactating Breasts. *Clin Nucl Med*. 2012 Mar;37(3):e57-8. **(First author) {SCI}**

INVITED LECTURES AND PRESENTATIONS

1. CAD in Women: the value of myocardial perfusion imaging. Taiwan Nuclear Cardiology Symposium, Chia-Yi, Taiwan, April 8, 2017.
2. Artificial intelligence in nuclear cardiology— My post-doctoral research in Cedars-Sinai Medical Center. Department of Radiology, Taipei Veterans General Hospital, Oct. 23, 2019.
3. New horizon for myocardial imaging with the use of a CZT gamma camera system. Taiwan Nuclear Cardiology Symposium, Taipei, Taiwan, July 18, 2020
4. Ventilation-perfusion scan in acute PE and CTEPH: a retrospect and prospect. Department of Chest Medicine, Taipei Veterans General Hospital. Apr. 22, 2021
5. DMSA renal cortical imaging. Department of Pediatrics, Taipei Veterans General Hospital, Jan. 12, 2022.