

Interventional of Cardiology Research Laboratory

Lab Introduction

To enhance the knowledge flow from molecular and genetic epidemiology to clinical medicine, the Interventional of Cardiology Research Laboratory was established in E-Da Hospital in 2007. This lab focuses on the genetic dissection of complex human diseases. The program gives special emphasis to deciphering the molecular mechanisms underlying cardiovascular disease to improve our capacities for cardiovascular disease diagnosis, prognosis, and treatment, as well as prevention. Recent research focus on four major themes: coronary artery disease, arrhythmias, heart failure, and ventricular function, vascular biology including prevention, and imaging. At the present time, three categories of research topics are included in our on-going projects:

1. Clinical and basic experimental studies of cardiovascular disease: A cohort prospective and cross-sectional investigation of risk factors, special on adipocytokines and inflammatory cytokines, in the pathogenesis, prognosis, prevention, and treatment of cardiovascular disease.
2. The electrophysiological effect of 3 protein-bounded uremic toxins: indoxyl sulfate, p-cresol, and p-cresyl sulfate on cardiomyocyte and their role in clinical arrhythmogenesis.
3. Developing and evaluating the rapid test device for clinical emergency and critical markers of Troponin-I and B-type natriuretic peptide detection.

Lab Members

Lab Administrator: Yung-Chieh Yen, M.D., Chao-Ping Wang, M.D., Chia-Chang Hsu, M.D., I-Ting Tsai, M.D., Li-Wen Lin, M.D., Yung-Chuan Lu, M.D., Wei-Chin Hung, M.D., Teng-Hung Yu, M.D., Cheng-ching Wu, M.D., Lee, Thung-Lip, M.D., Hsuan, Chin-Feng M.D., Wei, Ching-Ting, M.D.

Assistant Researcher : Fu-Mei Chung, Ph.D., Pei-Yang Tai, I-Ching Chen, Bo-Lun Lai

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Techniques:

Cell culture

RT-PCR

qPCR

ELISA

Paraffin block sectioning

Immunohistochemistry

Immunofluorescent stain

Equipments:

Polymerase chain reaction cyclers

Microcentrifuge

Digital dry bath

Magnetic stirrer

4°C, -20°C refrigerators, and liquid nitrogen tank (20L)

Research Projects

Project titles	PI	Source	Duration
A study of ficolins and gene polymorphism in the pathogenesis of heart failure, acute myocardial infarction, hepatocellular carcinoma, and diabetic kidney disease EDAHI111001	Chao-Ping Wang	EDAH	2022/02~2023/01
A study of inter-relationship of risk factors and pathways associated with primary arteriovenous fistula dysfunction in hemodialysis patients EDAHP111047	Cheng-Ching Wu	EDAH	2022/02~2023/01
A study of sarcopenia index, adipokines, and outcomes in patients with breast cancer EDAHP111034	Wei, Ching-Ting	EDAH	2022/02~2023/01

Selected Publications (2017~2022):

1. Wei-Chin Hung, Teng-Hung Yu, Cheng-Ching Wu, Thung-Lip Lee, Wei-Hua Tang, Chia-Chi Chen, I-Cheng Lu, Fu-Mei Chung, Yau-Jiunn Lee, Chia-Chang Hsu*
Nonalcoholic Fatty Liver Disease Is Related to Abnormal Corrected QT Interval and Left Ventricular Hypertrophy in Chinese Male Steelworkers. *Int J Environ Res Public Health*. 2022 Nov 6;19(21):14555.
2. Wei-Chin Hung#, Wei-Hua Tang#, Teng-Hung Yu, Cheng-Ching Wu, Chao-Ping Wang, Yung-Chuan Lu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee, Chia-Chang Hsu* Low

plasma growth/differentiation factor 1 levels are associated with liver fibrosis in patients with stable angina. *J Clin Lab Anal.* 2022 Oct 21;e24745.

3. Wei-Chin Hung, Teng-Hung Yu, Chao-Ping Wang, Chia-Chang Hsu, Yung-Chuan Lu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee, Cheng-Ching Wu*, Wei-Hua Tang* Fibroblast growth factor 21 is associated with widening QRS complex and prolonged corrected QT interval in patients with stable angina. *BMC Cardiovasc Disord.* 2022 Sep 30;22(1):432.
4. Yung-Chuan Lu#, Chao-Ping Wang#, Wei-Chin Hung, Cheng-Ching Wu, Teng-Hung Yu, Chia-Chang Hsu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee, Wei-Hua Tang* Interactive effect of obesity and cognitive function decline on the risk of chronic kidney disease progression in patients with type 2 diabetes mellitus: a 9.1-year cohort study. *Int J Med Sci.* 2022; 19(11): 1660-1671.
5. Wei-Hua Tang, Wei-Chin Hung, Chao-Ping Wang, Cheng-Ching Wu, Chin-Feng Hsuan, Teng-Hung Yu, Chia-Chang Hsu, Ya-Ai Cheng, Fu-Mei Chung, Yau-Jiunn Lee, Yung-Chuan Lu* The Lower Limit of Reference of Urinary Albumin/Creatinine Ratio and the Risk of Chronic Kidney Disease Progression in Patients With Type 2 Diabetes Mellitus. *Front Endocrinol (Lausanne).* 2022 Jun 2;13:858267.
6. Teng-Hung Yu#, Chin-Feng Hsuan#, Cheng-Ching Wu, Wei-Chin Hung, Thung-Lip Lee, I-Ting Tsai, Ching-Ting Wei, Jer-Yiing Houn, Fu-Mei Chung, Yau-Jiunn Lee, Yung-Chuan Lu* Association of plasma fatty acid-binding protein 3 with estimated glomerular filtration rate in patients with type 2 diabetes mellitus. *Int J Med Sci.* 2022 Jan 1;19(1):82-88.
7. Ching-Ting Wei, I-Ting Tsai, Cheng-Ching Wu, Wei-Chin Hung, Chin-Feng Hsuan, Teng-Hung Yu, Chia-Chang Hsu, Jer-Yiing Houn, Fu-Mei Chung, Yau-Jiunn Lee, Yung-Chuan Lu* Elevated plasma level of neutrophil gelatinase-associated lipocalin (NGAL) in patients with breast cancer. *Int J Med Sci.* 2021 May 13;18(12):2689-2696.
8. Thung-Lip Lee, Chin-Feng Hsuan, Cheng-Ching Wu, Wei-Chin Hung, I-Ting Tsai, Ching-Ting Wei, Teng-Hung Yu, I-Cheng Lu, Fu-Mei Chung, Yau-Jiunn Lee, Yung-Chuan Lu* Association between Triglyceride Glucose Index and Corrected QT Prolongation in Chinese Male Steelworkers. *Int J Environ Res Public Health.* 2021 Apr 12;18(8):4020.
9. Yung-Chuan Lu, Thung-Lip Lee, Chin-Feng Hsuan, Wei-Chin Hung, Cheng-Ching Wu, Chao-Ping Wang, Ching-Ting Wei, Teng-Hung Yu, Fu-Mei Chung, Yau-Jiunn Lee, I-Ting Tsai*. Elevated plasma fatty acid-binding protein 3 is related to prolonged corrected QT interval and reduced ejection fraction in patients with stable angina. *Int J Med Sci.* 2021 Mar 11;18(9):2076-2085.
10. Yung-Chuan Lu#, Cheng-Ching Wu#, I-Ting Tsai, Wei-Chin Hung, Thung-Lip Lee, Chin-Feng Hsuan, Teng-Hung Yu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee, Chao-Ping Wang*. Associations among total p-cresylsulfate, indoxyl sulfate and hippuric

acid levels with hemodialysis quality indicators in maintenance hemodialysis patients. *Clin Chim Acta*. 2021 Jan; 516 (2021) 83-91.

11. I-Ting Tsai, Wei-Chin Hung, Yung-Chuan Lu, Cheng-Ching Wu, Thung-Lip Lee, Chin-Feng Hsuan, Teng-Hung Yu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee, Chao-Ping Wang*. Circulating hepassocin level in patients with stable angina is associated with fatty liver and renal function. *Int J Med Sci*. 2021 Jan 1;18(1):1-7.
12. Chao-Ping Wang#, Yung-Chuan Lu#, Wei-Chin Hung, I-Ting Tsai, Yu-Hung Chang, Der-Wei Hu, Chia-Chang Hsu, Cheng-Ching Wu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee*. Inter-relationship of risk factors and pathways associated with chronic kidney disease in patients with type 2 diabetes mellitus: a structural equation modelling analysis. *Public Health*. 2021 Jan;190:135-144.
13. I-Ting Tsai#, Cheng-Ching Wu#, Wei-Chin Hung, Thung-Lip Lee, Chin-Feng Hsuan, Ching-Ting Wei, Yung-Chuan Lu, Teng-Hung Yu, Fu-Mei Chung, Yau-Jiunn Lee, Chao-Ping Wang*. FABP1 and FABP2 as markers of diabetic nephropathy. *Int J Med Sci*. 2020 Aug 27;17(15):2338-2345.
14. Yau-Jiunn Lee, Chao-Ping Wang, Wei-Chin Hung, Wei-Hua Tang, Yu-Hung Chang, Der-Wei Hu, Yung-Chuan Lu, Teng-Hung Yu, Cheng-Ching Wu, Fu-Mei Chung, Chia-Chang Hsu*. Common and Unique Factors and the Bidirectional Relationship Between Chronic Kidney Disease and Nonalcoholic Fatty Liver in Type 2 Diabetes Patients. *Diabetes Metab Syndr Obes*. 2020 Apr 17;13:1203-1214.
15. Cheng-Ching Wu#, Chao-Sung Chang#, Chia-Chang Hsu, Chao-Ping Wang, I-Ting Tsai, Yung-Chuan Lu, Jer-Yiing Houg, Chi-Chang Chang, Fu-Mei Chung, Yau-Jiunn Lee, Wei-Chin Hung*. Elevated Plasma Adiponectin Levels Are Associated with Abnormal Corrected QT Interval in Patients with Stable Angina. *Int Heart J*. 2020 Jan 31;61(1):29-38.
16. Chi-Chang Chang, Chao-Ping Wang, Wei-Chin Hung, Ching-Ting Wei, Wei-Hua Tang, Cheng-Ching Wu, I-Ting Tsai, Ya-Ai Cheng, Yau-Jiunn Lee, Chia-Chang Hsu*. Circulating P-Cresylsulphate Level is Associated with Hepatocellular Carcinoma in Chronic Hepatitis B or C Virus Infection. *E-Da Medical Journal* 2020;7(1):11-21
17. Yung-Chuan Lu#, Chi-Chang Chang#, Chao-Ping Wang, Wei-Chin Hung, I-Ting Tsai, Wei-Hua Tang, Cheng-Ching Wu, Ching-Ting Wei, Fu-Mei Chung, Yau-Jiunn Lee, Chia-Chang Hsu*. Circulating fatty acid-binding protein 1 (FABP1) and nonalcoholic fatty liver disease in patients with type 2 diabetes mellitus. *Int J Med Sci*. 2020 Jan 14;17(2):182-190.
18. I-Ting Tsai, Chia-Chang Hsu, Wei-Chin Hung, Chao-Ping Wang, Teng-Hung Yu, Jer-Yiing Houg, Kun-Tai Lee, Wei-Hua Tang*. The Arrhythmogenic Effect of Protein-Bound Uremic Toxin p-Cresylsulfate: an in vitro study. *Acta Cardiologica Sinica* 2019 Nov;35(6):641-648.

19. Mei-Chu Yen Jean, Chia-Chang Hsu, Wei-Chin Hung, Yung-Chuan Lu, Chao-Ping Wang, I-Ting Tsai, I-Cheng Lu, Yi-Hsin Hung, Fu-Mei Chung, Yau-Jiunn Lee, Teng-Hung Yu*. Association between lifestyle and hematological parameters: A study of Chinese male steelworkers. *J Clin Lab Anal.* 2019 Jun 26:e22946.
20. Chao-Ping Wang, Chia-Chang Hsu, Wei-Chin Hung, Teng-Hung Yu, Cheng-Ching Wu, I-Ting Tsai, Wei-Hua Tang, Fu-Mei Chung, Jer-Yiing Houg, Yau-Jiunn Lee, Yung-Chuan Lu*. Plasma fatty acid-binding protein 4 (FABP4) level is associated with abnormal QTc interval in patients with stable angina and chronic kidney disease. *BMC Cardiovasc Disord.* 2019 Jun 24;19(1):153.
21. Li-Wen Lin, Teng-Hung Yu, Wei-Chin Hung, Chao-Ping Wang, Cheng-Ching Wu, I-Ting Tsai, Chia-Chang Hsu, Ya-Ai Cheng, Yau-Jiunn Lee, Yung-Chuan Lu*. Periodontal Disease is Associated with Metabolic Syndrome - The Role of Peripheral Total and Differential Leukocyte Count-Related Metabolic Derangements. *E-Da Medical Journal* 2018 Dec;5(4)1-10.
22. Heng-Long Wang, Jung-Che Chang, Li-Wen Fang, Hsia-Fen Hsu, Li-Chiun Lee, Jyh-Feng Yang, Ming-Tsai Liang, Pei-Chi Hsiao, Chao-Ping Wang, Shih-Wei Wang, Chi-Chang Chang*, Jer-Yiing Houg*. *Bulnesia sarmientoi* Supercritical Fluid Extract Exhibits Necroptotic Effects and Anti-Metastatic Activity on Lung *Cancer Cells*. *Molecules.* 2018 Dec 13;23(12). pii: E3304.
23. Chao-Ping Wang, Teng-Hung Yu, Cheng-Ching Wu, Wei-Chin Hung, Chia-Chang Hsu, I-Ting Tsai, Wei-Hua Tang, Fu-Mei Chung, Jer-Yiing Houg, Yau-Jiunn Lee, Yung-Chuan Lu*. Circulating secreted frizzled-related protein 5 and chronic kidney disease in patients with acute ST-segment elevation myocardial infarction. *Cytokine.* 2018 Oct;110:367-373.
24. Cheng-Ching Wu, Yung-Chuan Lu, Teng-Hung Yu, Chao-Ping Wang, Wei-Chin Hung, Wei-Hua Tang, I-Ting Tsai, Fu-Mei Chung, Yau-Jiunn Lee, Jin-Jia Hu*. Serum albumin level and abnormal corrected QT interval in patients with coronary artery disease and chronic kidney disease. *Intern Med J.* 2018 Oct;48(10):1242-1251.
25. Teng-Hung Yu, Wei-Hua Tang, Yung-Chuan Lu, Chao-Ping Wang, Wei-Chin Hung, Cheng-Ching Wu, I-Ting Tsai, Fu-Mei Chung, Jer-Yiing Houg, Wen-Chun Lan, Yau-Jiunn Lee*. Association between hippuric acid and left ventricular hypertrophy in maintenance hemodialysis patients. *Clin Chim Acta.* 2018 Sep;484:47-51.
26. Wei-Hua Tang, Chao-Ping Wang, Teng-Hung Yu, Pei-Yang Tai, Shih-Shin Liang, Wei-Chin Hung, Cheng-Ching Wu, Sung-Hao Huang, Yau-Jiunn Lee, Shih-Chieh Chen*. Protein-bounded uremic toxin p-cresylsulfate induces vascular permeability alternations. *Histochem Cell Biol.* 2018 Jun;149(6):607-617.
27. Yung-Chuan Lu, Teng-Hung Yu, Wei-Hua Tang, I-Ting Tsai, Chao-Ping Wang, Wei-Chin Hung, Chia-Chang Hsu, Mei-Chu Yen Jean, Ya-Ai Cheng, Cheng-Ching Wu*. Increased Levels of Total p-Cresylsulfate are Associated with Anxiety in Patients with Chronic

Kidney Disease. *E-Da Medical Journal*. 2017; 4(2): 8-18.

28. Yung-Chuan Lu†, Chao-Ping Wang†, Teng-Hung Yu, I-Ting Tsai, Wei-Chin Hung, I-Cheng Lu, Chia-Chang Hsu, Wei-Hua Tang, Jer-Yiing Houn, Fu-Mei Chung, Mei-Chu Yen Jean*. Shift work is associated with metabolic syndrome in male steel workers-the role of resistin and WBC count-related metabolic derangements. *Diabetol Metab Syndr*. 2017 Oct 16;9:83.
29. Chao-Sung Chang, Tsai-Yun Chen, Yung-Chuan Lu, Teng-Hung Yu, Chao-Ping Wang, Wei-Chin Hung, Cheng-Ching Wu, Wei-Hua Tang, Ya-Ai Cheng, Mei-Chu Yen Jean*. Associations of peripheral total and differential leukocyte count with features of hyperuricemia in Chinese male steel workers. *E-Da Medical Journal* 2017;4(3):1-12
30. Teng-Hung Yu, Chao-Ping Wang, Wei-Chin Hung, Ya-Ai Cheng, Chih-Yu Chen, Li-Wen Lin*. Plasma Levels of Visfatin are Associated with Periodontal Disease Severity in Coronary Artery Disease Patients. *E-Da Medical Journal*. 2017; 4(1);10-17.
31. Mei-Chu Yen Jean, I-Ting Tsai, Chao-Ping Wang, Teng-Hung Yu, Yung-Chuan Lu, Hsuan-Ming Tsao, Charles Tzu-Chi Lee, Wei-Hua Tang*. High Initial Cardiovascular Events in ESRD Patients on Maintenance Dialysis: A Case-Crossover Study of Taiwan's National Health Insurance Database. *E-Da Medical Journal*. 2017; 3(4);8-16.
32. I-Ting Tsai, Chao-Ping Wang, Teng-Hung Yu, Yung-Chuan Lu, Chih-Wen Lin, Li-Fen Lu, Cheng-Ching Wu, Fu-Mei Chung, Yau-Jiunn Lee, Wei-Chin Hung, Chia-Chang Hsu*. Circulating visfatin level is associated with hepatocellular carcinoma in chronic hepatitis B or C virus infection. *Cytokine*. 2017 Feb;90:54-59.
33. I-Ting Tsai, Chao-Ping Wang, Yung-Chuan Lu, Wei-Chin Hung, Cheng-Ching Wu, Li-Fen Lu, Fu-Mei Chung, Chia-Chang Hsu, Yau-Jiunn Lee, Teng-Hung Yu*. The burden of major adverse cardiac events in patients with coronary artery disease. *BMC Cardiovasc Disord*. 2017 Jan 4;17(1):1.