Kaohsiung Medical University

RESEARCH CENTER QUARTERLY REPORT

Office of Research & Development

November 2025

contents

List of Research Centers

University-Level Academic Research Institute

Biomedical Artificial Intelligence Academy

https://baia.kmu.edu.tw
Dean：Dist. Prof. Henry Horng-Shing Lu
Deputy Dean: Prof. Chun-Wang Wei, Prof. Cheng-Che Lan
Division Director: Prof. Ming-Chung Chou, Prof. I-Chen Wu, Prof. Hao-Yun Kao
E-mail：baia@kmu.edu.tw

University-Level Academic Research Center

Research Center for Precision Environmental Medicine

https://envmed.kmu.edu.tw
MOE Higher Education Sprout Project-The Featured Areas Research Center Program (107~116)
CEO：Prof. Chih-Hsing Hung
Deputy CEO：Prof. Pei-Shih Chen, Prof. Chih-Jen Yang, Prof. Tusty-Jiuan Hsieh, Prof. Wei-Ting Liao, Clinical Asst. Prof. Da-Wei Wu
E-mail：envmed@kmu.edu.tw

Regenerative Medicine and Cell Therapy Research Center

https://rcc.kmu.edu.tw
CEO：Prof. Chung-Hwan Chen
Deputy CEO：Prof. Cheng-Chang Lu, Assoc. Prof. Bin Huang
E-mail：rcc@kmu.edu.tw

Drug Development and Value Creation Research Center

https://dvcr.kmu.edu.tw
CEO ：Prof. Chih-Hung Chuang
Deputy CEO：Prof. Yeng-Tseng Wang, Prof. Chia-Hung Yen
E-mail：dvcr@kmu.edu.tw

Center for Cancer Research

https://ccr.kmu.edu.tw
CEO：Chair Prof. Li-Tzong Chen
Deputy CEO：Prof. Ming-Yii Huang, Prof. Yu-Tse Wu, Prof. Pei-Feng Liu, Assoc. Prof. Hui-Ching Wang
E-mail：ccr@kmu.edu.tw

Precision Sports Medicine and Health Promotion Center

https://psmhpc.kmu.edu.tw
Director：Prof. Shang-Jyh Huang
Deputy Director：Prof. Pei-Hsi Chou, Prof. Nai-Jen Chang
CEO：Prof. Lan-Yuen Guo；Deputy CEO：Prof. I-Hua Chu, Assoc. Prof. Wei-Chun Hung
Division Director: Prof. Hwai-Ting Lin, Prof. Chia-Yen Dai, Asst. Prof. Yung-Li Hung
E-mail：psmhpc@kmu.edu.tw

Center for Metabolic Disorders and Obesity

https://cmdo.kmu.edu.tw
CEO：Chair Prof. Wan-Long Chuang
Deputy CEO：Deputy CEO：Prof. Jee-Fu Huang, Prof. Yi-Chun Tsai
E-mail：cmdo@kmu.edu.tw

University-Level Mission-Oriented Research Center

Center for Tropical Medicine and Infectious Disease Research

https://tmed.kmu.edu.tw
Director：Assoc. Prof. Chun-Yu Lin
Deputy Director：Prof. Sheng-Fan Wang, Prof. Po-Liang Lu
E-mail：tmed@kmu.edu.tw

Neuroscience Research Center

https://nrc.kmu.edu.tw
Director：Prof. Yuan-Han Yang
Deputy Director：Prof. Tzyh-Chyuan Hour, Assoc. Prof.Ping-Song Chou
E-mail：nrc@kmu.edu.tw

Center of Applied Genomics

https：//genomics.kmu.edu.tw
Director：Prof. Chia-Yang Li
E-mail：genomics@kmu.edu.tw

Center for Liquid Biopsy and Cohort Research

https://clbcr.kmu.edu.tw
Director：Director：Prof. Po-Liang Lu
E-mail：clbcr@kmu.edu.tw

Center for Big Data Research

https://bigdata.kmu.edu.tw
Director：Prof. Hung-Pin Tu
Deputy Director：Prof. Ming-Chung Chou, Prof. Ping-Ho Chen, Prof. Shih-Feng Weng, Assoc. Prof. Fu-Wen Liang
E-mail：bigdata@kmu.edu.tw

Center for Long-Term Care Research

https://cltcr.kmu.edu.tw
Director：Prof. Yi-Chun Tsai
Deputy Director：Assoc. Prof. Chia-Chi Yang, Asst. Prof. Tzu-Yu Lin, Asst. Prof. Tzu-Jung Fang
E-mail：cltcr@kmu.edu.tw

Center for Medical Education and Humanizing Health Professional Education

https://mehhpe.kmu.edu.tw
Director：Prof. Ming-Ju Tsai
Deputy Director：Prof. Cheng-Sheng Chen, Assoc. Prof. Yen-Ko Lin, Prof. Ju-Hui Wu
E-mail：mehhpe@kmu.edu.tw

Research Center for Medical Technology and Policy

https://rcmtp.kmu.edu.tw
Director：Prof. Chi-Kung Ho
Deputy Director：Prof. Pei-Shih Chen
E-mail：rcmtp@kmu.edu.tw

Indigenous Health Care and Cultural Sustainability Research Center

https://ihccsrc.kmu.edu.tw
Director：Prof. Chia-Yen Dai
Deputy Director：Prof. Ping-Ho Chen, Prof. Hong-Liang Lin, Assoc. Prof. Jong-Rung Tsai
E-mail：ihccsrc@kmu.edu.tw

University-Level Research Center Networking Event

Cross-Disciplinary Collaboration X Talent Recruitment X Casual Conversation

Written and Compiled by Office of R&D

To promote communication and collaboration between KMU's faculty, students, and university – level research centers, and to spark cross – disciplinary research ideas, the Office of Research and Development will regularly host the University – Level Research Center Networking Sessions from April 2025.

Each session will feature keynote presentations by the core teams of different centers.

Through the relaxed and enjoyable tea party format, these events aim to promote cross – department and cross – center collaborations, attract and recruit new blood to participate in related research, and organize research teams to apply for external funding.

Session 3 Research Center for Precision Environmental Medicine

This event was held by "Research Center for Precision Environmental Medicine (RCPEM)" on August 21, 2025. Through this event, the RCPEM aims to form innovative cross-disciplinary research teams to jointly investigate how exposure to multiple emerging environmental pollutants in real – world settings may pose risks to lung and kidney health in the Taiwanese population, as well as to elucidate their pathogenic mechanisms. The ultimate goal is to address environmental and health issues of both national and global concern.

Topic 1 Featured Theme of the Precision Environmental Medicine Research Center

Speaker : CEO Chih-Hsing Hung, Superintendent of Kaohsiung Municipal Siaogang Hospital

Summary :

The RCPEM actively leverages the clinical resources of KMU's medical system, identifying problems from the patient's perspective. Through cross-disciplinary integration – including environmental monitoring, epidemiological analysis, molecular mechanism studies, multi-omics approaches, and clinical medicine – the center investigates the causes and progression mechanisms of diseases and implements intervention and harm – reduction strategies. At the same time, the RCPEM has established a multi-level training framework to translate scientific knowledge into practice across diverse activity settings.

Topic 2 Introduction to Core Service Facilities of the Precision Environmental Medicine Research Center

Speaker : Postdoc. Yu-Ming Hsu

Summary :

The RCPEM has established an environmental exposome analysis platform using advanced instruments such as liquid chromatography – tandem mass spectrometry (LC-MS/MS) and gas chromatography – tandem mass spectrometry (GC-MS/MS). This platform supports human biomonitoring through the analysis of various biological samples – including blood, urine, and issues – to assess the relationship between environmental pollutant exposure and disease risk.

In addition, the RCPEM is progressively developing fee structures for different analytical methods and actively promoting its analytical services to the academic community, medical institutions, and industry. These efforts not only enhance the center's self-sufficiency and operational revenue but also strengthen external collaborations, expand the RCPEM's visibility and influence in the field of precision environmental medicine, and facilitate the translation and societal application of research findings.

Topic 3 Introduction to the University Social Responsibility (USR) Project on Environmental Education, Health Promotion, and Sustainable Development under Air Pollution (Air Pollution USR Project)

Speaker : Asst. Prof. Chia-Ju Lin, Co-PI

Summary :

The RCPEM collaborates closely with the Air Pollution USR Project, aligning with the SDGs goals of quality education, good health and well – being, and industry innovation and infrastructure. By integrating the center's strengths in environmental medicine research with university – industry collaboration mechanisms, the initiative jointly promotes the cultivation of academic and research talent and advances community-engaged practical programs. Through deep engagement in local settings and communities, the project fulfills the social responsibilities of a medical university while enhancing its international influence.

Topic 4 Research Sharing on Bioaerosols and Indoor Air Quality

Speaker : Deputy CEO Pei-Shih Chen, Vice President of Institutional Research & Sustainable Development

Summary :

Bioaerosols include microorganisms, endotoxins, and dust mite fragments (metabolites), all of which pose potential health risks. Examples include infections caused by pathogenic microorganisms – such as Mycobacterium tuberculosis and influenza viruses – which may result in tissue damage and disease; allergic diseases triggered by allergens, including hypersensitivity pneumonitis, allergic rhinitis, and asthma; and toxin – related conditions caused by exposure to substances such as mycotoxins and aflatoxins.

Therefore, the development of methods capable of detecting airborne pathogens and the successful capture of M. tuberculosis, avian influenza viruses, and others from air samples can be applied to disease outbreak prediction and early warning systems.

In addition, the research team conducts indoor and outdoor air monitoring for various gaseous and particulate pollu – ants. Using Taiwan's popular night markets as an example, the team found that PM1 and PM2.5 concentrations on business days were significantly higher than on non-business days. Moreover, children living within 595 meters of a night market exhibited poorer lung function compared to those living farther away (>595 meters). These findings may offer valuable insights for national air quality policy development.

Topic 5 Case Study and Demonstration of an Oil Fume Absorption Barrel for Exposure Reduction

Speaker : Prof. Chiung-Yu Peng, Department of Public Health

Summary :

To actively address the health hazards posed by cooking oil fumes, the RCPEM successfully developed a simple oil fume absorption barrel capable of reducing approximately 55% to 76% of harmful substances in oil fumes. The center has also produced instructional videos and made them freely available to food stall vendors and the public for reference and self-assembly.

In addition, the team has proactively engaged with local communities–such as the Linyuan Xiang – Ji Learning Center and Dingcuo Community Development Association – conducting visits and on – site assessments of vendors' exhaust systems. These efforts aim to help reduce environmental exposure and improve public health.

▲Opening Remarks by CEO Chih-Hsing Hung.

▲Special Topic Presentation by Postdoc. Yu-Ming Hsu.

▲Special Topic Presentation by Asst. Prof. Chia-Ru Lin.

▲Special Topic Presentation by Deputy CEO Pei-Shih Chen.

▲Special Topic Presentation by group member of Prof. Chiung-Yu Peng.

▲Exhibition and Hands-On Experience of R&D Achievements

Session 4 Center for Metabolic Disorders and Obesity

This session, organized by the Center for Metabolic Disorders and Obesity (hereafter referred to as the CMDO), was held on Sep. 17, 2025. Through this matchmaking event, the Center aims to serve as a bridge connecting clinical medicine, basic research, public health, and data science, thereby fostering interdisciplinary collaboration. The long-term goal is to translate research outcomes into actions that respond to the World Health Organization (WHO)'s global initiative on noncommunicable disease (NCD) prevention, specifically contributing to the target of reducing premature mortality from NCDs by one-third by 2030.

The event began with opening remarks by CEO Wan – Long Chuang, and followed by several insightful research presentations delivered by members of the CMDO, along with active on – site discussions and exchanges. CEO Chuang emphasized that since the establishment of the CMDO, it has been dedicated to integrating research strengths both within and outside the university to build a cross – disciplinary collaboration platform. With a mission of "clinical problem – driven research, and research outcomes feeding back into clinical practice, " the Center aims to advance metabolic disease and obesity research toward greater integration and evidence-based development.

Topic 1 Clinical Implementation of Exercise Prescription

Speaker : Vice Superintendent Chia-Yen Dai, KMUH

Summary :

This session shared how "exercise" can be transformed into a quantifiable, trackable, and monitorable therapeutic intervention.

- The precision exercise model (FITT – VP principle) and the KMU – PX program.
- Establishing a safety-first, cross-professional team consisting of physicians, coaches, and administrators.
- Developing a remote monitoring model using heart-rate tracking to assess exercise intensity.
- Implementing a 12 – week precision exercise intervention – based on clinical trials – for patients with obesity and metabolic diseases.

Topic 2 Current Status and Applications of the Cijin Cohort

Speaker : Superintendent Yi-Chun Tsai, KMCH

Summary :

This session shared research experiences from the Cijin Cohort.

- Initiated in 2016, the cohort has collected health data from more than 2,700 residents, with an average age of 48.9 years.
- Research topics include metabolic syndrome, chronic diseases, nutrition, and mental health.
- A comprehensive dataset has been established, including InBody measurements, dietary records, handgrip strength, walking tests, the MNA nutrition assessment, and the CES – D psychological scale.
- The team continues to build a multi-omics biobank and conduct long-term follow-up analyses, laying the foundation for a community-based cohort study.

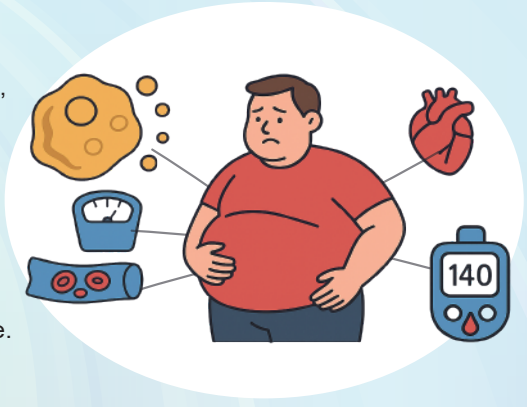
Topic 3 Metabolic Disease Mapping and Public Health Applications

Speaker : (Department Chair Hui-Min Hsieh), Department of Public Health

Summary :

From a public health perspective, this session explored how national – level health data can be integrated to construct a "Metabolic Disease Map."

- Integrating multiple data sources, including the National Health Insurance Research Database, disease registries, adult health examinations, and biobanks.
- Applying the map for early disease warning systems and analyses of health inequalities.
- Using spatial epidemiological methods to reveal regional differences in metabolic disease distribution, providing evidence for policy-making.
- Aiming to establish a visualized "Healthy Taiwan" monitoring platform aligned with international benchmarks such as the NCD-RisC database.



Topic 4 Missions and Research Directions of the CMDO

Speaker : Postdoc. Chih-Yuan Sui

Summary :

This session briefly emphasized the missions and research directions promoted by the CMDO.

- Integrating clinical cohorts and multi-omics databases, and combining university and hospital resources to establish a core research platform for metabolic diseases and obesity.
- Promoting interdisciplinary collaboration and academic internationalization by linking clinical departments and research centers to conduct cross-disciplinary evidence-based research, thereby expanding academic and policy influence.
- Cultivating young research talent and providing internship opportunities to build a co-creative research ecosystem. This environment enables early-career researchers to focus on solving important unsolved problems and accelerate research achievements.

During the event, the speakers and participants engaged in lively interactions. From clinical applications and data integration to student involvement and interdisciplinary collaboration, the CMDO continues to bring together cross-disciplinary strengths and actively respond to the WHO's global initiatives for chronic disease prevention and control.

▲Opening Remarks by CEO Wan-Long Chuang.

▲Special Topic Presentation by Vice Superintendent Chia-Yen Dai.

▲Special Topic Presentation by Superintendent Yi-Chun Tsai.

▲Special Topic Presentation by Department Chair Chui-Min Hsieh

▲Special Topic Presentation by Postdoc. Chih-Yuan Sui.

▲Collaboration & Partnership Networking.

▲Collaboration & Partnership Networking.

▲Group Photos (Left to right, first line: Superintendent Yi-Chun Tsai, Vice Superintendent Chia-Yen Dai, CEO Wan-Long Chuang; Right to left, 2nd line: Vice president of R&D office Chia-Yang Li, Department Chair Hui-Min Hsieh, Postdoc. Chih-Yuan Sui)

Indigenous Health Care and Cultural Sustainability Research Center

Date of Establishment: July, 2025

Research Focus

The Center is founded on the core values of health equity and cultural sustainability, integrating medical expertise with cultural sensitivity to promote community-based Indigenous health care models with local characteristics. Our primary research focus is on establishing culturally sensitive medical services by implementing the Indigenous e-Care System to develop telehealth promotion, day care, and community support programs. These initiatives aim to address the challenges of high chronic disease prevalence and population aging in tribal regions. Secondly, the Center emphasizes the revitalization and transmission of Indigenous languages and cultures through immersive language learning, educational material development, and cultural activities. These efforts aim to strengthen ethnic identity and foster intergenerational exchange. Furthermore, the Center promotes the establishment and systematic analysis of an Indigenous health database to support policy translation research. By providing evidence-based policy recommendations, we seek to assist the government in optimizing healthcare and health policies for rural and Indigenous communities. The Center also actively engages in cross-university, cross-institutional, and international collaborations, organizing thematic forums and academic conferences to broaden research perspectives and enhance policy influence. Ultimately, our goal is to cultivate local professionals with culturally safe care competencies, empower community autonomy, and develop sustainable models of health and cultural care. Through these efforts, we aim to ensure that our research outcomes are not only integrated into the healthcare system but also deeply rooted in community engagement—laying a solid foundation for the health and cultural sustainability of Taiwan's Indigenous peoples.

Introduction

The Center is dedicated to promoting health equity and cultural sustainability for Indigenous peoples as its core mission. By integrating medical expertise, cultural sensitivity, and interdisciplinary collaboration, the Center strives to reduce health disparities and preserve Indigenous cultures. Through three major dimensions—research, education, and service—we aim to establish evidence-based, community-oriented health care models that reflect local characteristics and strengthen community engagement. The Center also serves as a vital platform that connects government, academia, and local communities to foster collaborative action and meaningful impact.

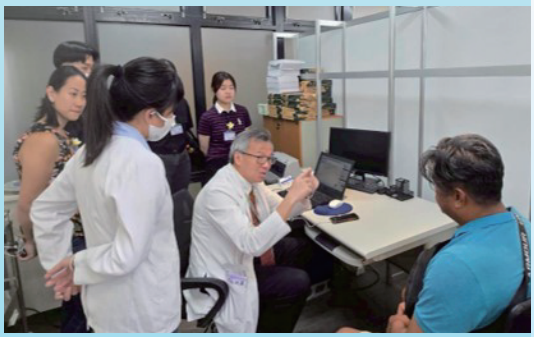
1.Developing Culturally Sensitive Health Care Models

The Center focuses on developing medical services that meet the cultural needs of Indigenous peoples, incorporating the Indigenous e-Care System to promote telemedicine, day care, and health promtion programs. By strengthening community support, the Center aims to reduce disparities caused by limited healthcare resources in remote areas.

2.Establishing an Indigenous Health Database and Policy Translation

The Center collects and consolidates health-related data on Indigenous peoples to establish a comprehensive research database. Through systematic analysis and policy research, the Center provides evidence-based policy recommendations to assist the government in improving healthcare and health policies for rural and Indigenous communities.

▲The Center's five main research themes are: Culturally Sensitive Health Care, Health Database and Policy Translation, Indigenous Language and Cultural Transmission, Interdisciplinary Collaboration, and Talent Cultivation.



▲Rural Healthcare Services (Outreach Medical Program)

3.Promoting Indigenous Language and Cultural Transmission

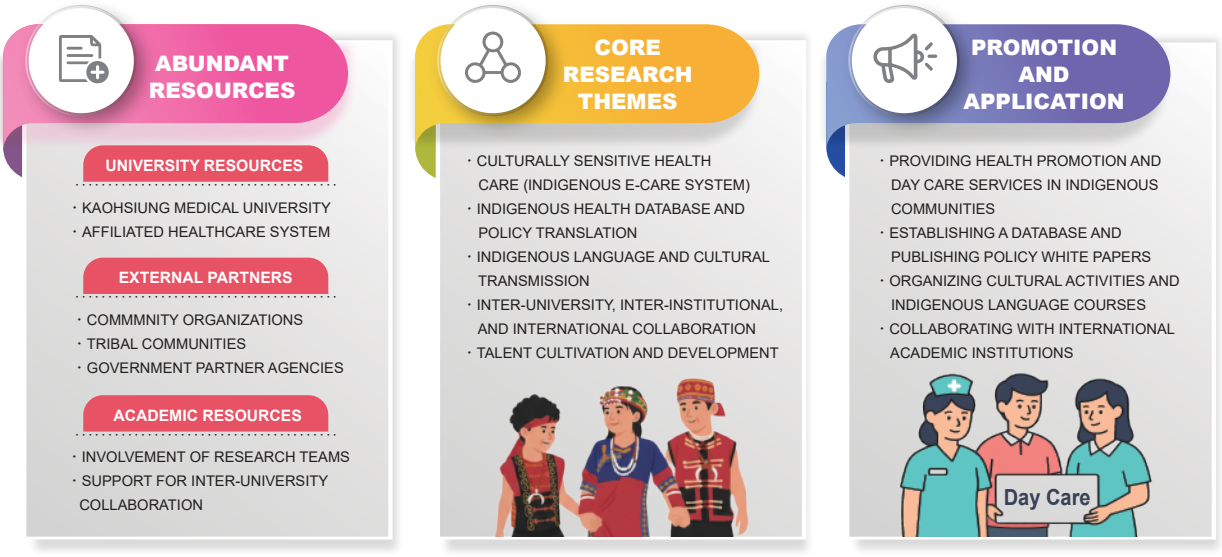
The Center promotes immersive Indigenous language learning, develops cultural teaching materials and activities, and encourages active community participation. By integrating these initiatives with service-learning courses and homecoming programs, the Center seeks to strengthen intergenerational connections and enhance cultural identity.

4.Promoting Inter-University, Inter-Institutional, and International Collaboration

The Center actively collaborates with domestic and international research institutions, organizing forums, conferences, and policy exchange platforms that bring together interdisciplinary experts to discuss issues related to Indigenous health and cultural sustainability. Through these efforts, the Center aims to enhance its academic visibility and strengthen its influence on policy development.

5.Talent Cultivation and Development

The Center organizes special lectures and forums to cultivate interdisciplinary professionals and research teams, thereby enhancing the quality of teaching and research. Through student forums and thematic discussions, the Center encourages greater student engagement and interest in public health policy. In addition, the Center is committed to nurturing young scholars by integrating policy planning and practical research, promoting the sustainable development of both academia and practice.



▲Diagram of the Center's Resource Allocation, Core Research Themes

Function and task architecture diagram / Organizational structure:

From Ward to Code: Cultivating the Next Generation of AI Nursing Innovators

University-Level Academic Research Institute - Biomedical Artificial Intelligence Academy (BAIA)

Author: RA Yi-Xiang Chen / Dean Henry Horng-Shing Lu

Facing the dual challenges of an aging population and a growing shortage of nursing manpower, BAIA of Kaohsiung Medical University (KMU) has launched the Nursing Innovation and Artificial Intelligence Talent Cultivation Program. By integrating AI (Artificial Intelligence) and VR (Virtual Reality) technologies into nursing education, this program aims to nurture a new generation of nursing professionals who possess both clinical sensitivity and digital creativity.

Through interdisciplinary courses, industry–academia collaboration, project-based learning, and faculty development, students learn to identify pain points in clinical practice and apply technology to solve real-world problems—fulfilling the threefold mission of Smart Care × Educational Innovation × Local Industry Connection.

Taiwan's healthcare system stands at a crucial turning point. As the elderly population rises and chronic diseases become more prevalent, nursing manpower shortages and high clinical workloads have become increasingly severe. Nurses face heavy administrative burdens, leading to burnout and turnover. This is not merely a manpower issue—it is an educational challenge.

If nursing students can learn to integrate AI and digital tools during their training, they can become not only caregivers but also innovators and changemakers. Guided by this vision, KMU launched the Nursing Innovation and AI Talent Cultivation Program, supported by the Ministry of Education's Smart Rainforest Industry Talent Development Initiative. The program merges artificial intelligence, virtual reality, and clinical innovation into an educational pathway that bridges nursing and technology.

Interdisciplinary Curriculum × Four-Stage Learning: From Coding Logic to Clinical Innovation

The program features four core learning clusters: Nursing Innovation, AI Fundamentals, AI Applications, and AI Practice—forming a complete learning framework over two years that takes students from theory to hands-on innovation.

- Nursing Innovation: Courses such as Innovative Nursing Education and Multimedia Nursing Theory foster creativity and problem-identification skills.
- AI Fundamentals: Students learn Python programming, Introduction to AI, and VR/AR Basics, building foundational understanding of intelligent care.
- AI Applications: Advanced topics include Machine Learning, Deep Learning, Image Processing, Conversational AI Development, and VR Simulation Design. Students apply these skills to analyze nursing data and develop virtual care simulations.
- AI Practice: Students complete a cross-disciplinary innovation capstone, collaborating with industry mentors and clinical advisors to present their outcomes in a public showcase.

Through this progression, nursing students move beyond simply using AI to actually creating AI applications. Partner institutions include KMU's Institute of Artificial Intelligence in Medicine, College of Nursing, Department of Healthcare Administration and Medical Informatics, and Center for General Education, as well as National Yang Ming Chiao Tung University's AI Program, HTC VIVE, and Ubiik Inc.—together forming a collaborative ecosystem for innovation grounded in clinical needs.

Technology in Practice × Educational Innovation: Bringing AI into Nursing Training

Emphasizing hands-on and immersive learning, the program enables students to go beyond coding and theory by developing VR-based ward simulations, AI chatbots, and interactive health education platforms. These systems are applied in clinical training, nursing education, and health promotion, helping students practice communication, crisis response, and ethical decision-making in realistic virtual scenarios.

The curriculum also integrates ChatGPT API applications, enabling students to explore how generative AI can assist with clinical communication, medical documentation, and automated nursing records—essential competencies for future smart care environments.

Collaborative project development is encouraged through interdisciplinary team-based learning and competitive showcases. Guided by both AI mentors and clinical instructors, students are expected to present prototypes addressing real clinical needs—from patient fall prediction models and pressure ulcer risk classification to immersive VR nursing training systems—demonstrating the full potential of AI × Nursing Innovation.

Faculty Co-Creation × Educational Sustainability: Establishing a Model for AI Nursing Education

To ensure long-term sustainability, the program promotes continuous faculty development and co-learning. Each semester, workshops such as AI Empowerment Camp, Design Thinking Bootcamp, and AI × Nursing Teaching Community equip educators with skills in AI ethics, data analysis, and VR-based lesson design.

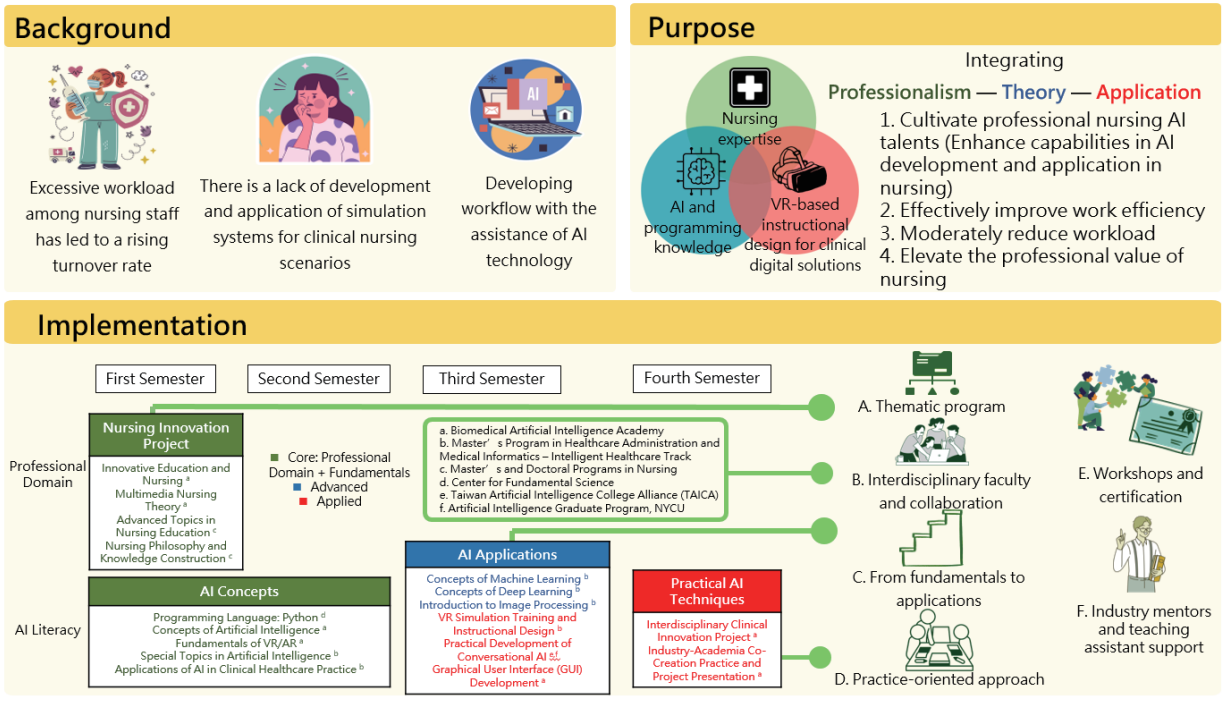
The program also launches an AI TA Training Camp to cultivate teaching assistants with programming expertise who can support classroom instruction. Industry experts from HTC and leading medical information companies are invited as mentors, providing professional consultation and career guidance.

Through this process, students evolve from clinical executors to problem-solvers and innovators, while teachers transform from lecturers to cross-disciplinary collaborators. The ultimate goal is to cultivate nursing professionals who integrate clinical competence, humanistic care, and AI innovation—empowering them to contribute to smart healthcare development, health technology design, and education in the digital era.

From Care to Innovation — Redefining the Future of Nursing

"The essence of nursing is humanity, but technology brings us closer to it." This belief underpins KMU's vision for the program. When AI, VR, and educational innovation converge, nursing education becomes more than skill transmission—it becomes an act of reimagining care.

The Nursing Innovation and AI Talent Cultivation Program is shaping a new generation of nurses who not only understand patients' needs but also design data-driven and algorithmic solutions for better care. They are not just AI users—they are creators of intelligent healthcare.



2025 Harvard Summer Program in KMU: Intensive Training Workshop on Precision Environmental Medicine

University-Level Academic Research Center- Research Center for Precision Environmental Medicine (RCPEM)

Postdoc Yu-Ming Hsu /CEO Chih-Hsing Hung

The Center for Precision Environmental Medicine has been actively developing a multi-level talent cultivation system. Over the past two years, in collaboration with Dr. Tzong-Shi Lu from Harvard Medical School and Brigham and Women's Hospital, we have jointly planned and organized summer training courses to cultivate researchers and clinical physicians in the field of environmental medicine, thereby contributing to the goals of SDG 3 (Good Health and Well-Being) and SDG 4 (Quality Education).

The Center for Precision Environmental Medicine (RCPEM) not only focuses on research related to environmental exposure and health impacts but also places strong emphasis on interdisciplinary collaboration and talent development. To this end, RCPEM is actively developing a multi-level training system designed to cultivate professionals with both research expertise and clinical competence in environmental medicine."

Last year, RCPEM collaborated for the first time with Dr. Tzong-Shi Lu from Harvard Medical School and Brigham and Women's Hospital to introduce the concept of Harvard's summer research program, launching a summer training course that combines both depth and breadth, which received positive feedback. This year, RCPEM once again joined forces with Dr. Lu to hold the "Intensive Training Workshop" during the summer break. Focusing on the field of precision environmental medicine and inviting Center's faculty members, including Prof. Chih-Hsing Hung, Prof. Shih-Hsien Hsu, Prof. Tusty-Jiuan Hsieh, Prof. Wei-Ting Liao, Dr. Chiung-Yu Peng, Dr. Da-Wei Wu, and Dr. Tsai-Hui Duh. The course content was specifically designed to meet the distinct academic needs of both graduate students and clinical physicians.

A total of 20 students from various departments participated in this course. The participants expressed high recognition and provided very positive feedback on the course.

▲Group photos from the ceremonies.

▲Lecture by Dr. Tzong-Shi Lu (Graduate Student Group).

▲ Lecture by Dr. Tzong-Shi Lu (Clinical Physician Group).

▲Lecture by center member (Graduate Student Group).

▲ Lecture by center member (Clinical Physician Group).

▲Oral Presentations by Participants.

▲Group photos from the closing ceremonies.

Other Important Highlights：

The research team of our center collaborated with Kaohsiung Municipal Siaogang Hospital, the Department of Geomatics at National Cheng Kung University, and the WaCare telehealth to establish the first 'Smart Lung Health Clinic' in Taiwan. By integrating the medical database of KMU, the air quality monitoring data from the Environmental Protection Bureau, and Geospatial Artificial Intelligence (Geo-AI) technology, the team jointly developed and continuously refined a "Chronic Obstructive Pulmonary Disease (COPD) Prediction System" that provides real-time disease prevention and clinical decision support. This system was granted a Taiwan utility model patent in 2025 (Patent No. M669643).

Achievements and Prospects of Inviting International Scholars for Special Lectures and Advancing Research Collaboration with the Center for iPS Cell Research and Application (CiRA), Kyoto University

University-Level Academic Research Center- Regenerative Medicine and Cell Therapy Research Center (RCC)

Author : RA Chun-Ya Kao /CEO Chung-Hwan Chen

Invitation for International Scholar Special Lecture

On August 7, 2025, RCC invited Associate Prof. Chun-Yuh Charles Huang from the Department of Biomedical Engineering, University of Miami (USA) to give a special lecture and engage in academic exchange.

Prof. Huang delivered a talk titled "Mechanobiology of Articular Cartilage and Intervertebral Disc," introducing how cells and tissues in articular cartilage and intervertebral discs respond to mechanical forces such as compression and tension. He also shared research findings that integrate experimental studies with computational modeling to explore the relationship between mechanobiology and energy metabolism.

The University of Miami is one of the leading private research universities in the southeastern United States, with a strong foundation and extensive international collaboration in medical and biological sciences.

Prof. Huang specializes in cartilage and intervertebral disc mechanobiology, cellular mechanotransduction, three-dimensional culture, and biomedical engineering modeling and design. These research areas closely align with the Center's major research directions, offering strong potential for future collaboration.

During the lecture and discussion, both parties had active and fruitful exchanges, laying the groundwork for future academic cooperation.

To further strengthen collaboration, the Center will dispatch Assistant Research Fellow Dr. Shun-Cheng Wu to visit the University of Miami from October 8 to 21, 2025. Through this visit, both sides aim to deepen research exchange in mechanobiology and regenerative medicine, enhance research capabilities, and elevate the international visibility of the university.

Promotion of Research Collaboration with Kyoto University's CiRA

The Center for iPS Cell Research and Application (CiRA) at Kyoto University, founded by Nobel Laureate Professor Shinya Yamanaka, is one of the world's most authoritative iPS cell research centers, consistently leading the global trend in the field of regenerative medicine.To promote substantial collaboration between our center and Kyoto University's CiRA, CEO Chung-Hwan Chen, Prof. Yin-Chih Fu and Emeritus Prof. Mei-Ling Ho have actively engaged in multiple exchanges, resulting in several concrete achievements:

- **September 2024 :** Our team visited Kyoto University's CiRA for technical exchange and collaborative discussions, and invited CiRA researchers to Taiwan in April 2025 to participate in the Taiwan–Japan–Singapore International Symposium) hosted by our center.
- **August 22–26, 2025 :** Prof. Chung-Hwan Chen, Prof. Yin-Chih Fu, and Postdoc Ling-Hua Chang visited Kyoto University again to discuss the details of a Memorandum of Understanding (MOU) and technical exchange programs with CiRA Deputy Director Professor Kenji Osafune. Both sides have reached a consensus on the MOU and are arranging for the official signing.
- **August 2025 :** Two members of our center (including one young scholar) conducted a two-week technical training on kidney differentiation techniques at CiRA laboratories. Two additional young scholars are scheduled to participate in advanced training in November.

Highlights of Technical Exchange:

- **Imported Technologies :** Training and introduction of key techniques in induced pluripotent stem cell (iPSC) culture, kidney differentiation, and quality control from Kyoto University.
- **Shared Technologies :** Our center contributed expertise in decellularized kidney scaffold preparation and microsurgical techniques for kidney transplantation, fostering a complementary partnership.

Collaboration Goals:

- To officially sign an international Memorandum of Understanding (MOU) with Kyoto University, establishing a long-term and stable academic collaboration platform.
- To strengthen our research capacity in stem cell and regenerative medicine technologies, and to enhance Taiwan's visibility and influence in the global field of regenerative medicine.

▲Group picture at the Center for iPS Cell Research and Application (CiRA),Kyoto University, Japan


▲Postdoc Ling-Hua Chang presenting and discussing research findings


▲Postdoc Ling-Hua Chang presenting and discussing research findings

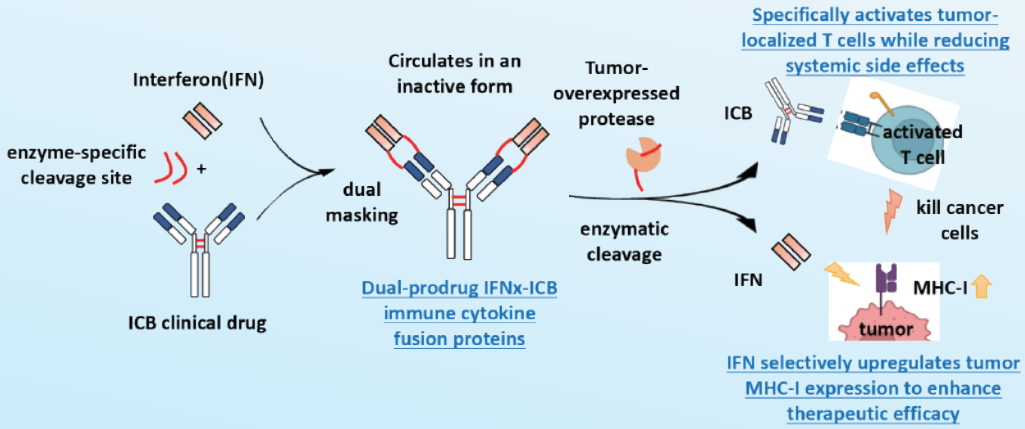

▲Assoc. Prof. Jia-Jung Lee presenting and discussing research findings

Development of Tumor-Selective Pro-Immunocytokines to Enhance the Efficacy and Safety of Immune Checkpoint Inhibitors

University-Level Academic Research Center /Drug Development and Value Creation Research Center

Author : CEO Chih-Hung Chuang

Over the past decade, immune checkpoint blockade (ICB) therapy has become a major milestone in solid tumor treatment. ICB reactivates T cells by blocking immunosuppressive signaling, thereby promoting immune-mediated tumor cell clearance. However, its overall response rate remains limited. According to data from the Industrial Economics and Knowledge Center (IEK), up to 80% of patients eventually discontinue treatment due to therapeutic failure or severe toxicity. One of the main causes of low response rates is the “immunologically cold” tumor microenvironment, characterized by insufficient expression of major histocompatibility complex I (MHC-I) and poor immune cell infiltration. Furthermore, current ICBs are administered systemically without tumor-specific activation mechanisms, often leading to indiscriminate immune activation and systemic side effects. To improve response rates, clinical studies have attempted to combine interferons (IFNs) to enhance tumor immunogenicity, but their high systemic toxicity has limited clinical application. To overcome these challenges, we developed a “dual-prodrug IFNx-ICB immunocytokine,” which integrates IFN with ICB antibodies and employs tumor-associated matrix metalloproteinases (MMP-2/9) for selective activation within the tumor microenvironment. This fusion antibody remains inactive in circulation, preventing systemic immune activation. Upon reaching the tumor site, MMP-2/9 enzymes specifically cleave the designed linker, releasing the active IFN and ICB antibody. IFN enhances the cytotoxic activity of T cells and NK cells against tumor cells, while the ICB antibody relieves immune inhibition, synergistically boosting antitumor immunity. Key advantages of the IFNx-ICB fusion antibody include: (a) Enzyme-selective activation design: Tumor-specific enzyme-cleavable linkers enable localized release and precision therapy, representing a novel class of actively activated ICB fusion antibodies. (b) Modular platform design: The patent claims interchangeable IFN modules (α/γ variants) and antibody modules (PD-1/PD-L1, CTLA-4, EGFR, etc.), providing high flexibility for therapeutic development. (c) Applicability to cold tumors: The platform targets tumors with low MHC-I expression (e.g., MSS-type colorectal cancer, melanoma, pancreatic cancer), addressing ICB-refractory indications and enabling upgrade of existing antibody pipelines. (d) Broad therapeutic potential: Initial validation was conducted in melanoma models. Notably, ipilimumab (anti-CTLA-4) and nivolumab (anti-PD-1) have demonstrated efficacy in non-small cell lung cancer and hepatocellular carcinoma. This strategy can be broadly applied to enhance the selectivity and safety of antibody-based therapeutics, paving the way for a “second-generation antibody class” with improved efficacy, reduced toxicity, and better patient quality of life.



We established a dual-prodrug immunocytokine platform strategy. Current IFN and ICB therapies lack tumor selectivity, often resulting in systemic side effects and limited efficacy. Through genetic engineering, we linked interferon (IFN) and immune checkpoint blockade (ICB) antibodies via a tumor-specific MMP-2/9 cleavage site to generate a tumor-selective pro-immunocytokine. This pro-immunocytokine remains inactive in systemic circulation and is only activated by MMP-2/9 enzymes within the tumor microenvironment. This enables tumor-specific T cell activation, thereby reducing systemic side effects. Furthermore, IFN enhances tumor MHC-I expression, improving T cell recognition of tumor cells and thereby increasing therapeutic efficacy.

Award

2024 21th National Innovation Award (Innoaward) - Selective activation of IFNγ-ipilimumab enhances the therapeutic effect and safety of ipilimumab.

Publication

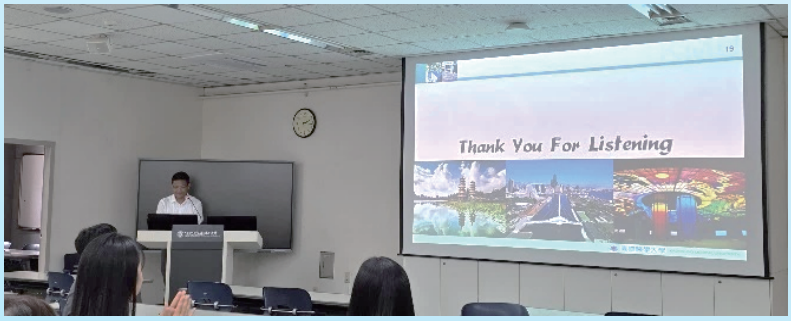
1.Huang, Y. J., Ho, K. W., Cheng, T. L., Wang, Y. T., Chao, S. W., Huang, B. C., Chao, Y. S., Lin, C. Y., Hsu, Y. H., Chen, F. M., & Chuang,. C. H. (2024). Selective activation of IFNγ-ipilimumab enhances the therapeutic effect and safety of ipilimumab. *International journal of biological macromolecules,* 265(Pt 2), 130945.

2.Lin, W. W., Lu, Y. C., Chuang, C. H., & Cheng, T. L. (2020). Ab locks for improving the selectivity and safety of antibody drugs. *Journal of biomedical science,* 27(1), 76

Other Important Highlights：

1. The center's team has been approved by the National Science and Technology Council's 114th "Artificial Intelligence Driven Drug Development Pilot Project".

2. Prof. Yeng-Tseng Wang went to Oxford University to attend “OXCEP Academic Medicine Course in Precision Medicine 2025” in July 2025.



3. In September 2025, Dr. Kai-Wen Ho, assistant research fellow, began a one-year research exchange at Asia University, South Korea, focusing on artificial intelligence-assisted drug development and bioinformatics analysis.

Dried Plasma Spot Technology: A Novel Tool for Enhancing Targeted Anti-Cancer Drug Monitoring

University-Level Academic Research Center- Center for Cancer Research

Author: Assoc. Prof. William C.W. Chang / CEO Li-Tzong Chen

In modern oncology, oral tyrosine kinase inhibitors (TKIs) have become a cornerstone in cancer treatment. However, these drugs often present clinical challenges due to their narrow therapeutic window and substantial inter-individual pharmacokinetic variability. Insufficient plasma levels may compromise efficacy, while excessive concentrations raise the risk of adverse effects. This underscores the clinical importance of Therapeutic Drug Monitoring (TDM) to ensure both safety and treatment effectiveness.

Despite its potential, TDM remains underutilized in routine practice, largely due to the limitations of conventional plasma sampling methods. Wet plasma requires timely centrifugation, cold-chain storage, and rapid laboratory processing, which complicate logistics and may compromise analyte stability. These barriers have constrained the widespread implementation of TDM in outpatient and decentralized clinical settings.

An Innovative Approach: Dried Plasma Spot (DPS) Sampling

To address these limitations, our research team has developed a Dried Plasma Spot (DPS) method, utilizing Volumetric Absorptive Microsampling (VAMS) devices. This technique requires only 20 µL of plasma, which is absorbed and dried directly onto the VAMS tip. Compared to traditional wet plasma, DPS offers several advantages: it simplifies storage and transport, enhances analyte stability, and eliminates potential interference from cellular components, thereby improving analytical accuracy.

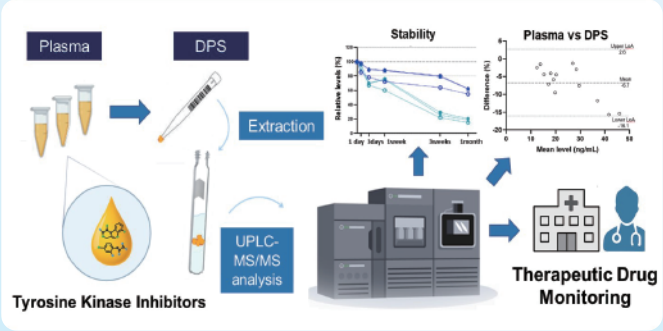
Analytical Platform and Validation

We established a UPLC–MS/MS platform validated according to FDA M10 bioanalytical method guidelines, capable of simultaneously quantifying nine clinically relevant TKIs and seven active metabolites. The assay demonstrated a quantitative range of 4–5000 ng/mL, covering therapeutic concentrations encountered in real-world practice. Both precision and accuracy metrics were within the ±15% acceptance range, confirming the platform's reliability for clinical application.

Notably, DPS exhibited markedly improved stability under frozen conditions. After one week at −20°C, only 5 analytes remained within acceptable limits in wet plasma, whereas 11 analytes remained stable in DPS. Certain compounds, such as imatinib, regorafenib, afatinib, nilotinib, and lenvatinib, retained stability for over three weeks in DPS, highlighting its advantage for long-term storage and remote sampling scenarios.

Clinical Sample Evaluation

To assess real-world performance, we analyzed 74 paired plasma and DPS samples collected from 37 cancer patients receiving TKI therapy. Concentration levels of several drugs, including afatinib and dasatinib, showed strong agreement between the two matrices, supporting the feasibility of using DPS as a clinical alternative. However, compounds such as imatinib and regorafenib were consistently underestimated in DPS, indicating that matrix-specific calibration models are necessary for certain analytes. These findings underscore the need to consider drug-specific behavior and matrix effects when applying DPS for TDM.



▲ Comparison of drug stability in traditional wet plasma and Dried Plasma Spot (DPS) samples. The study demonstrated that DPS samples preserved TKI analytes more effectively. With UPLC–MS/MS quantification, DPS can support precise therapeutic drug monitoring and individualized dose adjustment in clinical practice

Lu, I.W., Yeh, T.J., Wu, Y.T., Huang, Y.B., **Chen, L.T.*, Chang, W.C.W.*** (2025). Development of a dried plasma spot method for enhanced stability of tyrosine kinase inhibitors in therapeutic drug monitoring: A comparative study with wet plasma. *Microchemical Journal*, 218, 115197.

Clinical Implications and Future Perspectives

DPS offers clear operational advantages by reducing dependency on cold-chain logistics and enabling low-volume sampling for TDM. This is particularly beneficial for outpatient settings, remote areas, or situations requiring extended sample storage. Our study confirms that DPS holds strong potential as a practical tool for individualized anti-cancer therapy, with future integration into home sampling workflows and passive plasma separation technologies further expanding its clinical utility. Ultimately, DPS could facilitate more accessible, accurate, and patient-centered drug monitoring in oncology.

Enhancing Clinical Nutrition Competencies for Healthcare Professionals — A Series of Educational Lectures (2025)

University-Level Academic Research Center - Precision Sports Medicine and Health Promotion Center (PSMHPC)

Author : RA Chan-Chih Hsu / CEO Lan-Yuan Kuo

To enhance healthcare professionals' accurate understanding of sports nutrition, the Center launched a four-week lecture series that clarified the core differences between general nutrition and sports nutrition. Participants were guided to understand energy metabolism and nutrition strategies in exercise settings, establishing a solid foundation for future advanced courses and supporting clinical care and health promotion applications.

With the increasing importance of "sports nutrition" in clinical care and health promotion, the PSMHPC held the "Clinical Nutrition Enhancement Series Lectures for Healthcare Professionals" in 2025 to enhance medical professionals' correct understanding of sports nutrition and promote knowledge exchange between clinical practice and sports science.

This course series, running from June to September 2025, is divided into two phases, each lasting two months. Weekly thematic training sessions are offered, focusing on the core differences between general nutrition and sports nutrition. The courses guided participants to a deep understanding of the mechanisms of energy metabolism and nutritional strategies in sports settings. In addition to theoretical lectures, practical case studies are incorporated to explore the nutritional needs of different groups (such as patients with chronic diseases, athletes, and the general public) in health promotion, assisting participants in applying their knowledge to clinical care and health management.

Through the professional guidance and interdisciplinary sharing of the lecturers, participants not only established a complete knowledge framework of sports nutrition, but also laid the foundation for subsequent advanced courses. The PSMHPC will continue to promote related educational activities in the future, deepen the clinical integration of sports and nutrition, practice the concept of "from treatment to health promotion", and build KMU into a core base for promoting sports medicine education in southern Taiwan.

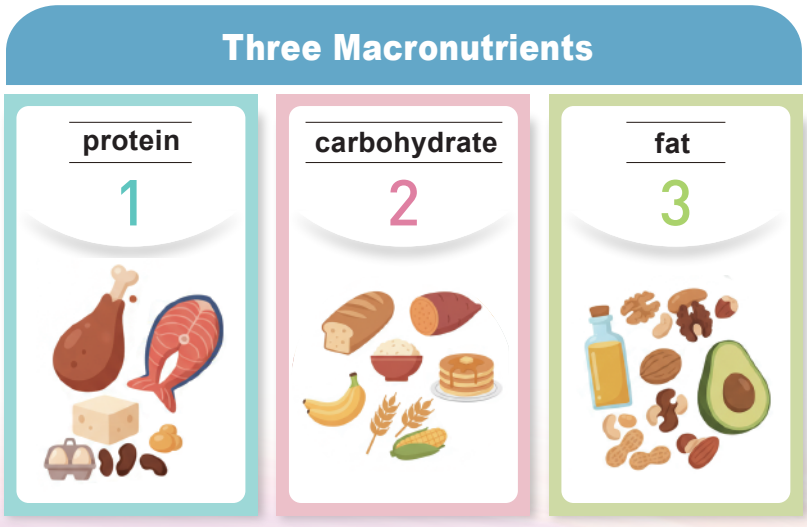
▲Director Shang-Jyh Huang introduced PSMHPC and speaker.

▲Teaching Examples in Daily Life.

▲Lecture by Asst. Prof. Wen-Hsin Chang.

▲Q&A session

▲Group Photo (Left to right: Dr. Wei-Chung Tsai, Director Shang-Jyh Huang, Asst. Prof. Wen-Hsin Chang, Division Director Hwai-Ting Lin)



Metabolic Dysfunction–Associated Steatotic Liver Disease (MASLD): A Whole-Body Warning that Begins with Fat

University-Level Academic Research Center- Center for metabolic disorder and obesity (CMDO)

The liver is one of the body's most silent yet busiest organs.

It metabolizes sugars, fats, and proteins, while also handling detoxification, energy storage, and immune regulation.

However, as modern lifestyles shift toward excessive calorie intake—characterized by weight gain, high sugar and fat consumption, and physical inactivity—this "biochemical factory" becomes overloaded.

Fat begins to accumulate quietly, metabolic balance is disrupted, and a new epidemic emerges: metabolic liver disease.

1. What Is MASLD?

Metabolic dysfunction–associated steatotic liver disease (MASLD) refers to a chronic liver condition arising from metabolic abnormalities such as obesity, diabetes, and dyslipidemia.

Previously known as nonalcoholic fatty liver disease (NAFLD), the term MASLD now highlights the underlying metabolic dysfunction rather than alcohol consumption.

Diagnosis requires evidence of hepatic fat accumulation (by imaging or biochemical testing) plus at least one metabolic abnormality.

Globally, MASLD affects about 38% of adults, and by 2050, an estimated 40–45% of adults in Asia—and over 48% in some regions—may be impacted.

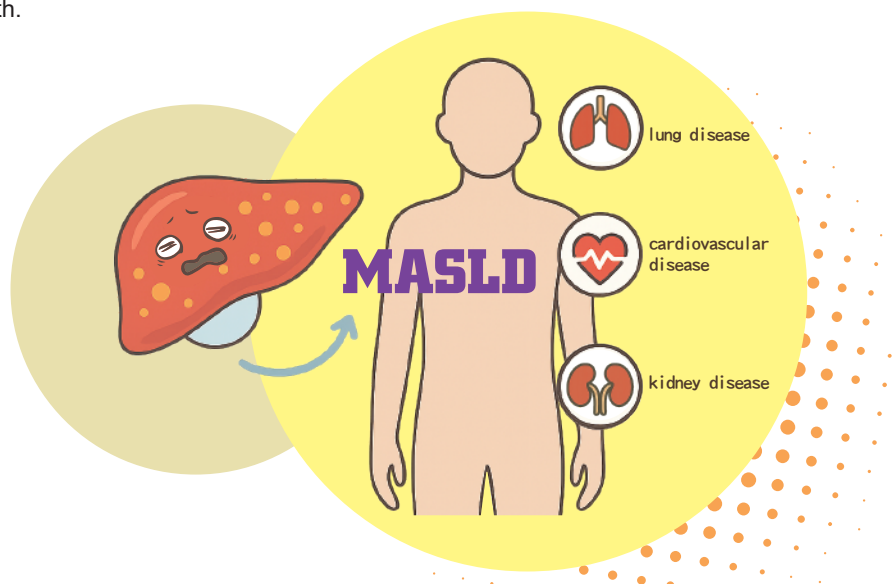
2. Health Impacts: From the Liver to the Whole Body and Beyond

MASLD is not merely a liver disorder. Beyond progression to fibrosis, cirrhosis, and liver cancer, it is strongly linked with diabetes, cardiovascular disease, and chronic kidney disease.

Large prospective studies further reveal that MASLD increases susceptibility to respiratory (thoracic) diseases, including: influenza, pneumonia, chronic obstructive pulmonary disease (COPD), asthma, interstitial lung disease, pleural disease, pulmonary embolism, lung cancer, and bronchial carcinoma—along with higher rates of respiratory-related mortality.

The more severe the fibrosis, the higher the prevalence of both systemic and thoracic comorbidities. Interactions between gut–liver–lung immunity and chronic inflammation create a vicious cycle of modern metabolic illness.

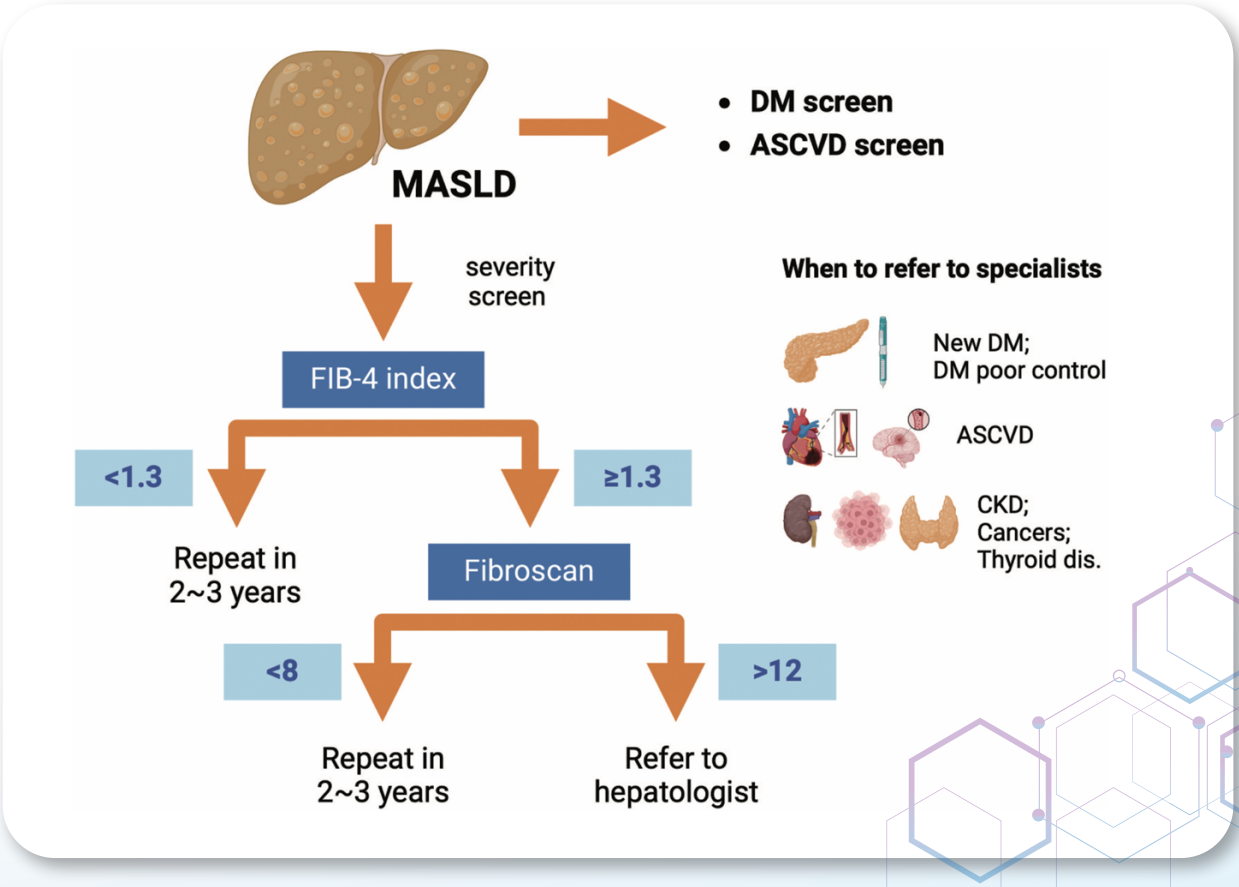
These findings emphasize that fatty liver is a systemic warning sign.
Treatment should go beyond liver enzyme control, requiring multidisciplinary, integrated care to protect overall health.



3. High-Risk Populations

According to international diagnostic criteria, individuals meeting any of the following are considered high-risk: besity or central obesity (BMI ≥ 23 kg/m²; waist > 90 cm in men, > 80 cm in women); Type 2 diabetes or impaired glucose metabolism (fasting glucose ≥ 100 mg/dL or HbA1c ≥ 5.7%); Elevated blood pressure (≥ 130/85 mmHg); Dyslipidemia (triglycerides ≥ 150 mg/dL; HDL ≤ 40 mg/dL in men, ≤ 50 mg/dL in women).

A diagnosis of MASLD requires hepatic steatosis plus at least one of the above metabolic risk factors.



▲Figure. The screening strategy of MASLD patients.
Non-invasive fibrosis screening and FIB-4–based risk stratification are recommended for patients with diabetes or metabolic dysfunction.
(Yeh, M.L., et al., Metabolic dysfunction-associated steatotic liver disease and diabetes: the cross-talk between hepatologist and diabetologist. *Expert Rev Gastroenterol Hepatol.*, 2024; 18(8): 431–439.)

4. Prevention and Reversal: The Hope of Recovery

The greatest danger of MASLD lies in its silence—but its greatest advantage is its reversibility. Research shows that lifestyle improvements—balanced nutrition, increased physical activity, and regular sleep—can gradually restore liver and metabolic health.

Reducing sugar and fat intake, exercising regularly, and maintaining consistent daily routines lower the risk of disease progression and complications.Clinical trials confirm that personalized, multidisciplinary lifestyle management can significantly improve MASLD outcomes.

Recently, novel pharmacologic approaches have expanded treatment possibilities:
Selective thyroid hormone receptor-β agonists (e.g., Resmetirom) and Glucagon-like peptide-1 receptor agonists (GLP-1RA). Both have demonstrated efficacy in reducing hepatic inflammation and fibrosis in large-scale trials—marking a new era in MASLD therapy.

5.KMU's Commitment: Toward a Healthier City and Precision Public Health

The CMDO of KMU brings together clinical experts across specialties, basic scientists, AI researchers, and public health professionals in collaboration with government partners.

By linking national health insurance data, Ministry of Health and Welfare databases, local government registries, and hospital records, the team employs big data analytics and geographic information systems (GIS) to: Map the regional distribution and burden of MASLD across Taiwan. Inform public health policy and resource allocation.

Simultaneously, the Center promotes community-based health screening, multidisciplinary care pathways, self-management mobile apps, lifestyle monitoring, and genetic risk analysis.

Collaborations among hepatology, cardiology, nephrology, pulmonology, endocrinology, and AI data teams are building personalized health promotion programs, integrating clinical medicine with public health data to enhance metabolic well-being for all citizens.

Conclusion:

MASLD is the cost of modern lifestyle imbalance. Its prevention and management require cross-disciplinary collaboration, healthy eating, regular exercise, adequate rest, and precision public health strategies supported by government and community efforts.

Together, these actions safeguard not only individual health—but the future well-being of families and the nation.

References:

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13. Yeh, M.L., et al., The efficacy of multi-disciplinary lifestyle modifications in Taiwanese nonalcoholic steatohepatitis patients. *Kaohsiung J Med Sci,* 2024. 40(6): p. 575-582.
14. Yeh, M.L., et al., Metabolic dysfunction-associated steatotic liver disease and diabetes: the cross-talk between hepatologist and diabetologist. *Expert Rev Gastroenterol Hepatol,* 2024. 18(8): p. 431-439.

Research Platform Services

Attune NxT Flow Cytometer plateform

Research Center for Precision Environmental Medicine

The Attune NxT Flow Cytometer harnesses acoustic focusing—ultrasonic standing waves within a microfluidic channel—to align and concentrate cells and particles into a single, narrow stream for optical interrogation. Compared with traditional hydrodynamic focusing, acoustic focusing reduces or eliminates the need for large volumes of sheath fluid, minimizes sample dilution, and gently positions particles at pressure nodes for more consistent signal intensity and less shear stress on fragile cells. These benefits enable higher throughput, improved reproducibility, and efficient use of small or precious samples.

With configurable lasers and detectors, the Attune NxT supports multiplexed fluorescence and scatter measurements for applications such as immunophenotyping, cell-cycle analysis, apoptosis assays, and rare-event detection. Its acoustic focusing design enables higher throughput, improved reproducibility, and efficient use of small or precious samples, making it suitable for research, clinical studies, and biomanufacturing workflows.

Services and Charges

Services	Charges
External flow cytometry analysis	NT$900/hr
On-campus unit flow cytometry analysis	NT$600/hr
On-campus self-operated use	NT$300/hr

- Users must complete training and receive approval from the instrument manager before booking.
- Flow cytometer fees are charged by the hour; any portion of an hour is billed as one full hour.
- Billing is based on actual usage time.
- If a user fails to arrive within the reserved time, charges apply based on the original reservation duration.
- If needed and not infringing on the next user's rights, the instrument manager may approve extended use; overtime fees apply and any portion of an hour is billed as one full hour.

Contact：
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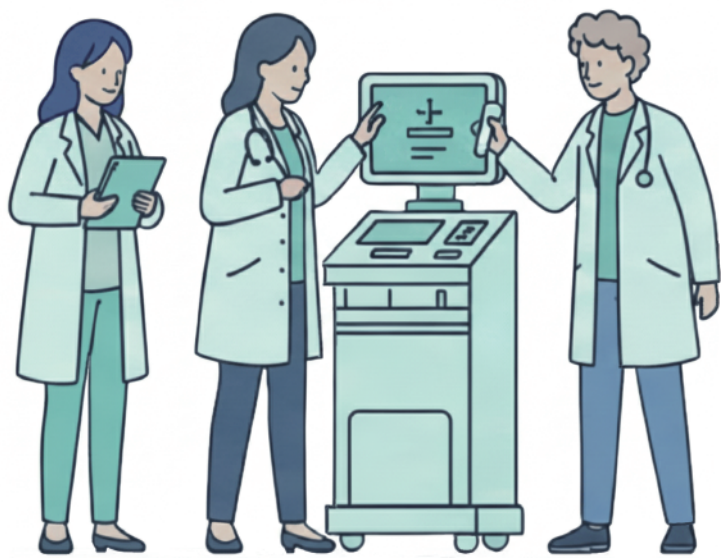
Important Events

2025
Harvard Summer Program in KMU Intensive Training Workshop on Precision Environmental Medicine

Date /Time: Jul. 15 Tue. ~Jul. 24 Thurs. , 2025

Venue : IR 6F, International Academic Research Building, KMU

On summer vacation in 2025, RCPEM and Dr. Tzong-Shi Lu from Harvard Medical School and Brigham and Women's Hospital, jointly held summer training courses.



Organizer : Research Center for Precision Environmental Medicine (RCPEM)
Co-Organizer: Higher Education Sprout Project, Ministry of Education (MOE)

Important Events

KMU AI seminar

Challenges and Opportunities Faced by the Healthcare Industry in the Age of Artificial Intelligence

Date /Time: Jul. 16 Wed., 2025 12:10~13:20

Venue: 1st Conference Room, 6F, Frank C. Chen Memorial Building, KMUH

Speaker : Chin-Chi Kuo (Vice Superintendent, Big Data Center, China Medical University Hospital)

With the rapid advancement of artificial intelligence technologies, the healthcare industry is undergoing a profound transformation. AI has brought groundbreaking innovations to clinical diagnosis, disease prediction, and personalized medicine. However, the most critical challenge remains in the management and sharing of medical data.

This lecture will take a macro perspective to explore how medical big data is reshaping the healthcare ecosystem, and how healthcare institutions can create value and sustainability through technology-driven innovation. It will also share the development experience of the iHi Platform (ignite Hyper-intelligence) — a large-scale electronic medical record integration platform that ensures data quality through its “Smart Data Chip” technology, supporting AI model development, clinical validation, and translational applications. The platform has successfully fostered multiple academia–industry collaborations and international exchanges.

In addition, the concept of Lego Data Intelligence will be introduced, emphasizing modular, composable, and iterative AI data strategies. Like building with LEGO bricks, medical data can be flexibly assembled and expanded according to clinical scenarios, enhancing model adaptability and reusability while accelerating the translation of AI innovations into frontline healthcare applications.

This talk aims to inspire dialogue across academia and industry on how to harness big data process management in the AI era — transforming challenges into opportunities and strengthening Taiwan’s position in global medical innovation. integration of sports and nutrition, practice the concept of "from treatment to health promotion", and build KMU into a core base for promoting sports medicine education in southern Taiwan.

Organizer : Biomedical Artificial Intelligence Academy (BAIA)
Co-Organizer : Medical AI Innovation and Application Center, KMUH

Important Events

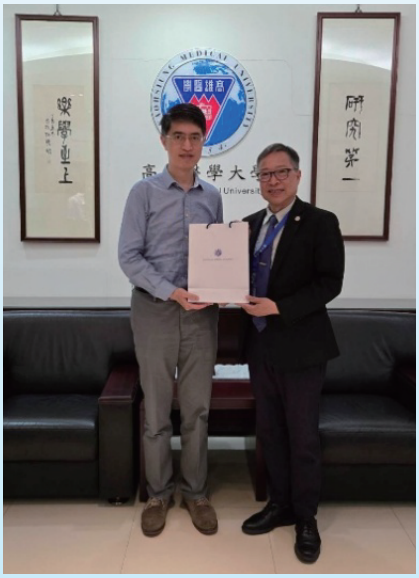
Generate Diverse Protein Conformations through AlphaFold

Date /Time : July 17, 2025 Thurs. 12:10~13:20

Venue : 1st Conference Room, 6F, Frank C. Chen Memorial Building, KMUH

Speaker : Dr. Samuel Kou (Chair of the Department of Statistics, Harvard University)

This lecture approaches the topic from the perspectives of statistics and machine learning, using practical examples to explore how to overcome the limitations of AlphaFold's static structure prediction. It is especially suitable for participants interested in bioinformatics, structural biology, or AI applications.



Organizer : Biomedical Artificial Intelligence Academy (BAIA)

Important Events

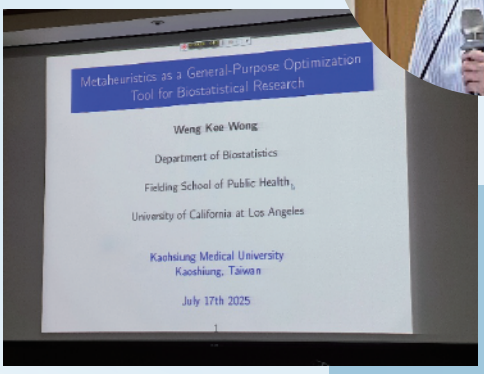
Metaheuristics as a General-Purpose Optimization Tool for Biostatistical Research

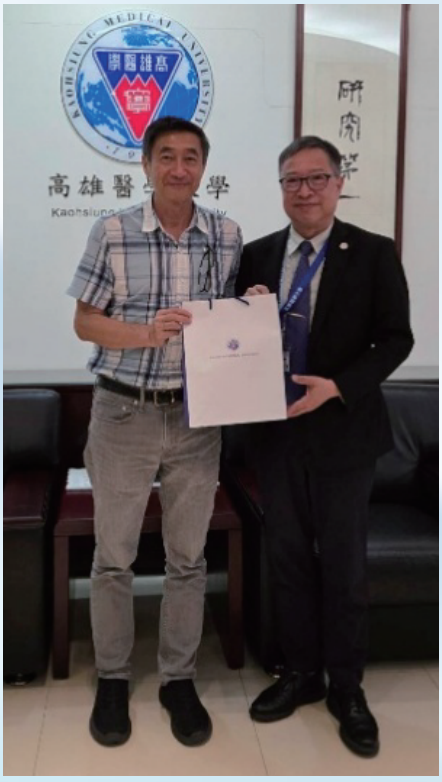
Date /Time: July 17, 2025 Thurs. 13:30～14:30

Venue : 1st Conference Room, 6F, Frank C. Chen Memorial Building, KMUH

Speaker : Dr. Weng Kee Wong (Professor, Department of Biostatistics, UCLA Fielding School of Public Health)

This lecture introduces the principles and advantages of metaheuristic algorithms, demonstrating how they can effectively solve complex optimization problems without relying on prior assumptions. Practical applications in biostatistics and early-stage clinical trial design will be showcased, highlighting the cross-disciplinary innovation potential of these methods.





Organizer: Biomedical Artificial Intelligence Academy (BAIA)

Navigating Mental Health in the Digital Age: Online Interventions for Young Adults from Prevention to Treatment

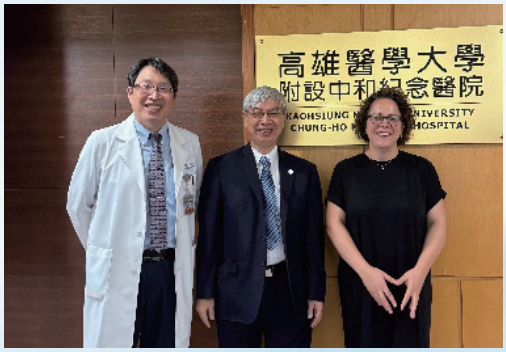
Date /Time: July 22, 2025 The. 12:10～13:20

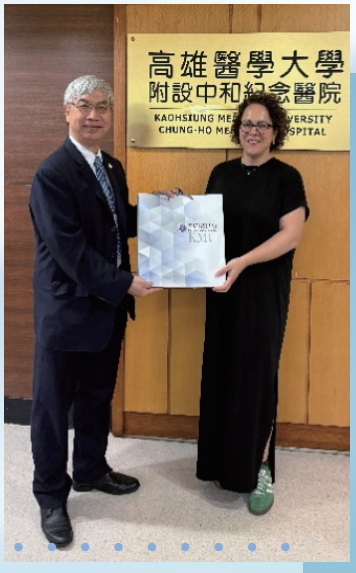
Venue : 1st Conference Room, 6F, Frank C. Chen Memorial Building, KMUH

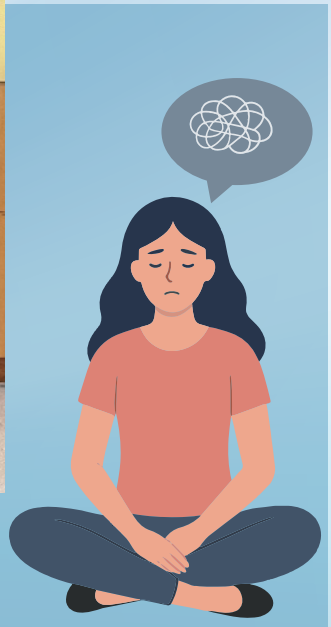
Speaker : **Dr. Elisabeth Kohls** (Psychologist and Senior Researcher, Department of Psychiatry and Psychotherapy, University Leipzig)

We are honored to invite Dr. Elisabeth Kohls from Germany, an expert in psychology, to deliver this lecture. Dr. Kohls will share her research on online psychological interventions targeting young populations—including adolescents, help-seekers, university students, and young adults facing mental health challenges.

Her talk will cover practical applications such as conversational support systems, self-management tools, and online therapy programs. Dr. Kohls will also introduce the treatment philosophy and model adopted by the Department of Acute Psychiatry at Leipzig University Medical Center, where she serves, offering valuable insights and practical experiences for clinicians and researchers in related fields.







Organizer: Biomedical Artificial Intelligence Academy (BAIA)

Important Events

Smart Fitness Assessment

Date /Time: Jul. 26 Wed. ~Jul. 27 Thurs. , 2025

Venue: Decathlon Fengshan Store (No. 59, Wenhua Rd., Fengshan Dist., Kaohsiung City 83006, Taiwan)

To promote scientific fitness concepts and health promotion services, the Center worked with Decathlon Taiwan and the Department of Sports Medicine at KMU to hold a smart physical fitness testing activity. Using several technology-based fitness testing devices, participants were given personalized exercise advice and health data analysis to help them better understand their physical condition and improve their exercise safety and effectiveness.

Organizer : Precision Sports Medicine and Health Promotion Center (PSMHPC)
Co-Organizer : Decathlon Taiwan Co., Ltd.; Department of Sports Medicine, KMU

Summer Faculty Health Promotion Exercise Program

Date /Time: Aug. 4 Mon. ~ Aug. 27 Wed. , 2025

Venue: Dance Studio, B2, Chi-Shih Building, KMU

The Center conducted a one-month program integrating exercise and health education for faculty members to promote regular exercise participation and enhance physical and mental health.

AGENDA

Session	Date	Topic
1	Aug.04	Introduction to Weight Training: Concepts × Breathing × Motor Control
2	Aug.05	Activating Functional Muscles: Movement Control & Joint Protection Strategies
3	Aug.06	Start from the Core: Enhancing Stability & Improving Posture
4	Aug.07	Beginner Strength Training: Safe and Effective Bodyweight Exercise
5	Aug.11	Beginner Tools: Application of Dumbbells, Kettlebells & Resistance Bands
6	Aug.12	Introductory Full-Body Strength Circuit Training
7	Aug.13	Shoulder Power-Up: 3D Deltoid Development
8	Aug.14	Glute-Focused Training: Squat & Hip Thrust Essentials
9	Aug.18	Back Sculpting: Lat Activation & Core Stability
10	Aug.19	Leg Aesthetics: Balanced Development of Quadriceps & Hamstrings
11	Aug.20	Chest Conditioning Class: Push, Squeeze & Support Techniques
12	Aug.21	Calf Muscle Strengthening & Lower-Limb Stability Training
13	Aug.25	Shoulder & Neck Relief × Strength Maintenance Training
14	Aug.26	Single-Leg Stability × Functional Lower-Limb Movement
15	Aug.27	Push–Pull Training Principles: Complementary Muscle Group Strategies

Organizer: Precision Sports Medicine and Health Promotion Center (PSMHPC)
Co-Organizer: Center for Sports Injury Prevention & Fitness; Department of Sports Medicine, KMU

Important Events

2025 Exercise Prescription Professional Development Lecture Series

Date /Time : Aug. 6 Wed. ~sep 24, 2025 ; per Wednesday 12:00~13:00

Venue : 1st Conference Room, 6F, Frank C. Chen Memorial Building, KMUH

To enhance healthcare personnel's competencies in exercise intervention and clinical application, the Center organized the "Exercise Prescription Professional Development Lecture Series for Healthcare Personnel" in 2025. Held over a two-month period with weekly sessions, the program covered topics such as kettlebell training, physical conditioning, and sports nutrition to support participants in mastering exercise prescription principles.

Date	Venue	Lecturer	Topic
Aug. 06, 2025	6F-2nd Lecture Hall, Frank C. Chen Memorial Building, KMUH	Prof. I-Hua Chu	Exercise Risk Assessment
Aug. 13, 2025	6F-1st Lecture Hall, Frank C. Chen Memorial Building, KMUH	Prof. I-Hua Chu	Fundamental Principles of Exercise Prescription
Aug. 20, 2025	6F-1st Lecture Hall, Frank C. Chen Memorial Building, KMUH	Coach Ting-Hsuan Chou	Exercise Prescription for Older Adults
Aug. 27, 2025	6F-1st Lecture Hall, Frank C. Chen Memorial Building, KMUH	Coach Ting-Hsuan Chou	Low Back Pain & Post-Surgical Rehabilitation Training
Sep. 03, 2025	6F-2nd Lecture Hall, Frank C. Chen Memorial Building, KMUH	Coach Yin-Yu Chen	Diabetes Exercise Prescription with Clinical Case Sharing
Sep. 10, 2025	1st Conference Room, Frank C. Chen Memorial Building, KMUH	Coach Yin-Yu Chen	Exercise Prescription for Dementia
Sep. 17, 2025	6F-2nd Lecture Hall, Frank C. Chen Memorial Building, KMUH	Coach Hao Chen	From the Heart: Exercise Training for Individuals with Disabilities (Daily Activity Adaptations)
Sep. 24, 2025	6F-1st Lecture Hall, Frank C. Chen Memorial Building, KMUH	Coach Hao Chen	Beyond Daily Living: Progression Strategies for Disability Training

Organizer : Precision Sports Medicine and Health Promotion Center (PSMHPC)
Co-Organizer: 有你禎顥Kettlebell training center, 豪健康Sports Working Room; Department of Sports Medicine, KMU

The Glimmer of Smart Healthcare – Turning Hope into a Torch

Date /Time: Aug., 27, Wed. , 2025 12:10~13:20

Venue : CS201 Classroom, Chi-Shih Building, KMU

Speaker : Ching-Ting Tan (Vice Superintendent, NTUH Hsin-Chu Branch)

The promotion of smart healthcare requires cross-disciplinary collaboration and collective effort. Healthcare professionals must evolve from being mere users of technology to key designers and drivers of innovation. Meanwhile, academia, researchers, and industry partners act as sparks that ignite the torch of progress, together creating a warm and hopeful new health ecosystem.

To align with national policy on smart healthcare development, the Smart Healthcare Innovation Center of National Taiwan University Hospital Hsin-Chu Branch was established in May 2021 as a cross-domain integration platform promoting human-centered smart healthcare strategies. Since its founding, the Center has collaborated with over 30 industry partners in developing, validating, and promoting smart healthcare solutions, bridging health technology and medical services to pioneer a new generation of healthcare innovation.

Each individual's creative ideas in smart healthcare are like small rays of light—together forming a torch of collective hope that will illuminate the future of intelligent health.

Organizer: Biomedical Artificial Intelligence Academy (BAIA)
Co-Organizer: Medical AI Innovation and Application Center, KMUH;
Teaching and Learning Development and Resource Center

Important Events

NHRI Forum - Kaohsiung Experts' Meeting: Exploring the Practicality of Using Real-World Data for Health Technology Assessment: The Case Study on the Allocation of the NT$10 Billions New Cancer Drug Funds

Date /Time : Aug., 29, 2025 Fri. 8:40～16:00

Venue : B1 Auditorium, First Teaching Building, KMU

Speaker :

1. **Honorary Distinguished Professor Rong-De Wang** (Department of Public Health, NCKU & Department of Occupational and Environmental Medicine, NCKU Hospital)
2. **Vice Superintendent, Dr. Wu-Wei Lai** (Tainan Municipal An-Nan Hospital)
3. **Attending Physician, Dr. Seu-Chun Yang** (Department of Internal Medicine, NCKU Hospital)

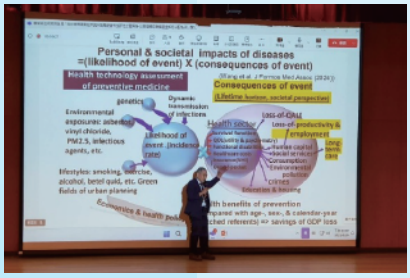
This forum explored the application of real-world data in health technology assessment, aiming to enhance both efficiency and equity. Supported by the National Health Research Institutes (NHRI) Forum Program, Prof. Rong-De Wang and his team have organized expert meetings across northern, central, and southern Taiwan to gather insights and recommendations for policy and practical application. The morning session featured expert discussions, while the afternoon workshop, chaired by Prof. Wang, who shared his 20 years of experience and practical examples. Through interactive Q&A sessions, the event integrated professional and public perspectives, providing valuable input for policy and practice.

▲Opening Speaker: Prof. Chi-Kung Ho, Director

▲Distinguished guests and participants

▲Presentation of Dr. Seu-Chun Yang

▲Q&A session



▲Presentation of Prof. Jung-Der Wang

▲Q&A session

Organizer: Research Center for Medical Technology and Policy (RCMTP), National Health Research Institutes (NHRI) Forum

KMUH's ECG AI Development and Participation in the TSHA Project's Journey to a European Multinational AI Tour

Date /Time : Sep., 3, 2025 Wed. 12:10~13:20

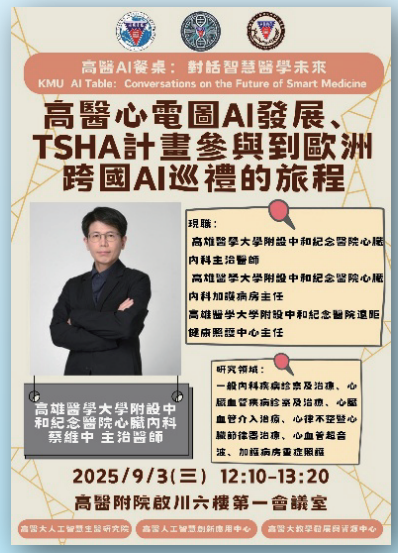
Venue : 1st Conference Room, 6F, Frank C. Chen Memorial Building, KMUH

Speaker : Wei-Chung Tsai (Attending Physician, Division of Cardiology, KMUH; Assoc. Prof., School of Post-Baccalaureate Medicine)

This lecture features the Cardiology team of KMUH sharing their insights and experiences gained throughout the development of AI-assisted electrocardiography (AI-ECG). The team has been deeply engaged in AI-based electrocardiogram (ECG) research, establishing a solid foundation through extensive development and collaboration. Partnering with Professor Hsi-Chih Li's AI Lab at National Sun Yat-sen University, the team successfully developed an innovative ECG-based AI model for sudden cardiac death risk assessment.

This achievement was subsequently integrated into the TSHA Project led by the National Science and Technology Council (NSTC), involving federated learning and validation across medical centers and resulting in the successful acquisition of a Taiwan patent.

The team also participated in an international visit to Europe with Dr. Shih-An Chen's TSHA team, which broadened their global perspectives and provided valuable insights. The Kaohsiung Medical University Hospital cardiology team is delighted to share their experiences and lessons learned throughout this journey in AI ECG development.



Organizer : Biomedical Artificial Intelligence Academy (BAIA)
Co-Organizer : Medical AI Innovation and Application Center, KMUH;
Teaching and Learning Development and Resource Center, KMU

Important Events

Slimming & Fitness Challenge — Faculty Health Improvement Campaign

Date /Time : Sep. 22 Mon. ~Sep. 26 Fri. , 2025

Venue : IR840, International Research Building 8F & Dance Studio, B2, Chi-Shih Building

To improve body composition and health awareness among university staff, the Center organized the "Slimming & Fitness Challenge," a competition specifically designed for individuals with a normal BMI but a higher body fat percentage. The program combined nutrition education with resistance training sessions to help participants effectively reduce body fat percentage and improve muscle strength. Throughout the activity, regular body composition monitoring and professional coaching were provided to enhance participants' motivation to maintain healthy exercise and dietary habits.

Organizer : Division of Health Services, Office of Student Affairs
Co-Organizer : Precision Sports Medicine and Health Promotion Center (PSMHPC)

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