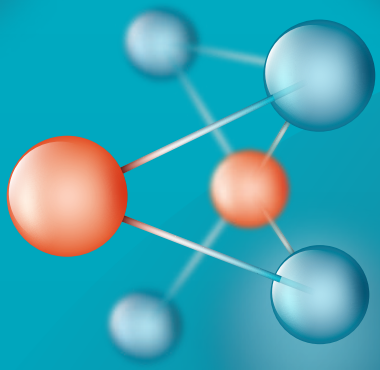
KMU
Kaohsiung Medical University



RESEARCH CENTER QUARTERLY REPORT

2026.03

OFFICE OF RESEARCH & DEVELOPMENT

RESEARCH CENTER QUARTERLY REPORT

CONTENTS

LIST OF RESEARCH CENTERS

University -Level Academic Research Institute

Biomedical Artificial Intelligence Academy (BAIA)

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
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University-Level Academic Research Center

Research Center for Precision Environmental Medicine (RCPEM)

[MOE Higher Education Sprout Project-The Featured Areas Research Center Program (107~116)]

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Deputy CEO：Prof. Pei-Shih Chen, Prof. Chih-Jen Yang,
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Regenerative Medicine and Cell Therapy Research Center (RCC)

https://rcc.kmu.edu.tw
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Deputy CEO：Prof. Cheng-Chang Lu,
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Drug Development and Value Creation Research Center (DVCR)

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Center for Cancer Research (CCR)

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Center for Metabolic Disorders and Obesity (CMDO)

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Precision Sports Medicine and Health Promotion Center (PSMHPC)

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CEO：Prof. Lan-Yuen Guo；Deputy CEO：Prof. I-Hua Chu, Assoc. Prof. Wei-Chun Hung
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University-Level Mission-Oriented Research Center

Neuroscience Research Center (NRC)

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Center for Tropical Medicine and Infectious Disease Research (TMED)

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Center for Big Data Research (CBDR)

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Center for Disease Multi-Omics Research (ATOMICS)

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CEO：Prof. Chia-Yang Li；Deputy CEO：Prof. Yi-Ching Lin
Division Director: Prof. Yi-Chang Liu,
Asst. Prof. Chao-Ju Chen,
Asst. Prof. Sin-Hua Moi
Division Section Director: Dr. Peir-In Liang,
Prof. Hsin-Chih Yeh,
Asst. Prof. Pei-Kang Liu,
Assoc. Prof. Ying-Chi Lin,
Asst. Prof. Chia-Hsin Liu,
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Indigenous Health Care and Cultural Sustainability Research Center (IHCCSRC)

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Deputy Director：Prof. Ping-Ho Chen,
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Culturally Grounded Health Care: Developing a New Model for Urban Indigenous Medical Education and Cultural Sustainability

University-Level Mission-Oriented Research Center
Indigenous Health Care and Cultural Sustainability Research Center (IHCCSRC)
Director Chia-Yen Dai

Indigenous health care is not merely a medical issue; it is deeply intertwined with culture, ways of life, and community relationships. Centering on urban Indigenous peoples, the Center integrates medical expertise with cultural knowledge to promote culturally responsive health education through elders' experiential sharing, intergenerational dialogue, and the development of medical education picture books. Through these efforts, the IHCCSRC seeks to advance health equity for indigenous communities while supporting cultural sustainability.

As the Indigenous population increasingly concentrates in urban areas, sustaining cultural continuity and developing health care models that are responsive to cultural contexts in metropolitan settings have become pressing issues. Positioned as a university-level, mission-oriented initiative, the Indigenous Health Care and Cultural Sustainability Research Center (IHCCSRC) at Kaohsiung Medical University(KMU) is dedicated to integrating perspectives from medicine, public health, and indigenous cultures to address the health needs of urban Indigenous communities.

On Nov. 25, 2025, the Center organized an exchange event centered on a "Dialogue with Urban Indigenous Elders and Community Members." Elders and leaders from Indigenous organizations were invited to share life experiences, caregiving wisdom, and cultural perspectives.

Through intergenerational dialogue, the event fostered mutual understanding among community members and strengthened social connections. The event also featured a press release of the first draft of an "Indigenous Medical Education Picture Book", which translates medical and health knowledge into culturally grounded narratives and is envisioned as an important medium for culturally sensitive health education.

The picture book is developed based on the everyday life contexts of Indigenous communities, integrating medical expertise with cultural perspectives. It aims to enhance community members' understanding of and engagement in health care, while serving as an important teaching aid for health professionals and students to better understand indigenous cultures. Through visual and image-based presentation, the book lowers barriers to understanding health and medical knowledge and supports culturally sensitive communication and teaching.

Looking ahead, the IHCCSRC will continue to deepen its efforts in Indigenous health care and cultural sustainability through educational outreach, community partnerships, and interdisciplinary integration. By developing an urban indigenous health care model that balances medical professionalism, cultural respect, and sustainable development, the Center seeks to fulfill the university's social responsibility and lay a foundation for health equity among Indigenous peoples.

Elders and senior members of Indigenous-related associations sharing their experiences

Presentation of the first draft of the Indigenous Medical Education Picture Book

Vice President Chih-Lung Lin delivering opening remarks

The then Deputy Director Hong-Liang Lin discussing the first draft of the picture book with Section Chief Shu-Hong Ge from the Indigenous Peoples Commission

On-site Exchange and Interaction

Group Photo after the Event

Press Released：
1.【Live News】Building Cross-Disciplinary Collaboration: KMU Advocates for Advancing Urban Indigenous Health and Cultural Sustainability(https://more-news.tw/462827/)
2.【Taiwan Good News】Cross-Disciplinary Collaboration Launched! KMU Advocates for Advancing Urban Indigenous Health, Education, and Cultural Sustainability (https://newstaiwan.net/2025/11/26/383225/)
3.【Taiwan Shin Sheng Daily News】Cross-Disciplinary Collaboration Launched: KMU Advocates for Advancing Urban Indigenous Health, Education, and Cultural Sustainability (https://www.tssdnews.com.tw/?FID=64&CID=841095)
4.【Newtalk】Cross-Disciplinary Collaboration Launched! KMU Advocates for Advancing Urban Indigenous Sustainability (https://newtalk.tw/news/view/2025-11-26/1006693)
5.【True Morning News】Cross-Disciplinary Collaboration Launched! KMU Advocates for Advancing Urban Indigenous Health, Education, and Cultural Sustainability (https://5550555.com/web/story.html?s=323391#6)
6.【Sky News Taiwan】KMU Advocates for Advancing Urban Indigenous Health, Education, and Cultural Sustainability through Cross-Disciplinary Collaboration (https://tw-skynews.com/?p=99670)
7.【NOWnews】Cross-Disciplinary Collaboration: KMU Advocates for Advancing Indigenous Health Education and Cultural Sustainability (https://www.nownews.com/news/6758514)
8.【TITV News】(https://youtu.be/CLIOqtPtRQ0?si=E0Z_xq6Jq6C8r1tY)

NEWLY-ESTABLISHED RESEARCH CENTERS

University-Level Mission-Oriented Research Center
Date of Establishment: October, 2025

Advancing the "Treating Disease Before It Manifests" Vision, KMU Establishes the Center for Disease Multi-Omics Research

KMU ATOMICS as a New Asia-Pacific Hub for Subhealth-Oriented Precision Medicine

Asst. Res. Fellow Zhao-Feng Chen, CEO Chia-Yang Li

Against the backdrop of population aging and the growing burden of chronic diseases, healthcare is steadily shifting from treatment after disease onset toward earlier risk identification and prevention. In 2026, KMU officially launched the Center for Disease Multi-Omics Research and its flagship initiative, KMU ATOMICS (Advanced Trans-Omics Infrastructure for Chronic Subhealth). By integrating resources from KMU Chung-Ho Memorial Hospital and university research units, the Center is building a multi-omics integrated database and AI-enabled platform focused on subhealth and signature disease entities. Its long-term aim is to establish a sustainable, scalable data infrastructure that directly supports clinical decision-making, turning the philosophy of "treating disease before it manifests" into a measurable, verifiable model of precision prevention.

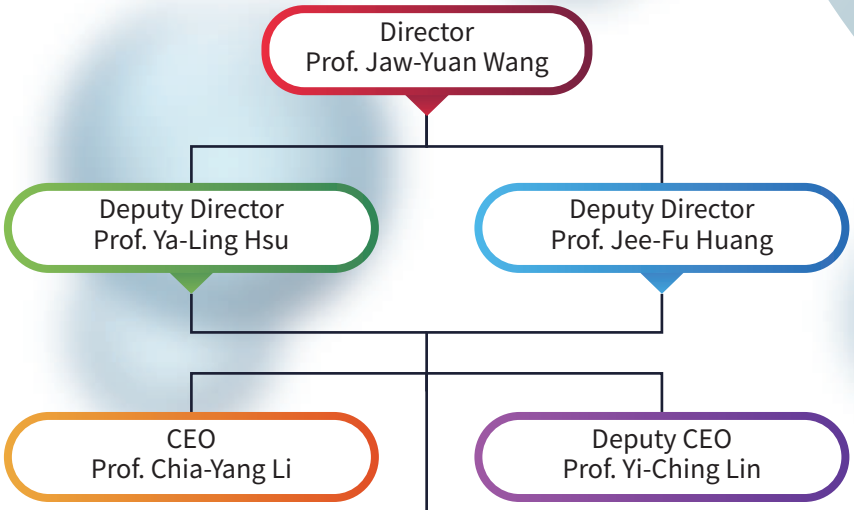
Many major chronic conditions, including metabolic syndrome, metabolic dysfunction-associated steatotic liver disease (MASLD), chronic fatigue, and sleep disorders, evolve through a prolonged subhealth stage before a clear clinical diagnosis is made. Individuals in this gray zone may not meet diagnostic criteria, yet carry substantially higher risks of progressing to metabolic diseases, cardiovascular disease, or even cancer. The core mission of the Center is to capture these early and fragmented physiological signals by integrating genomics, transcriptomics, proteomics, metabolomics, and clinical and lifestyle information, and to develop biologically interpretable risk assessment and prediction models. These models are intended to identify high-risk individuals earlier and to support evidence-based intervention, follow-up, and stratified care.

To ensure that multi-omics data can be effectively translated into research and clinical practice, the Center has designed an end-to-end operational framework spanning biospecimen collection, data generation, analysis, and application. On the front end, biobank operations coordinate cohort studies and disease-oriented recruitment in close collaboration with multiple clinical research teams, ensuring that specimens and clinical data are both representative and of high quality. On the experimental side, the Center leverages the capabilities of KMU Chung-Ho Memorial Hospital' s laboratory medicine department and affiliated research units to provide whole-genome and whole-exome sequencing, as well as proteomic and metabolomic profiling, supporting a wide range of research and clinical needs. For data analysis, standardized preprocessing workflows are being established, coupled with statistical modeling and machine learning approaches to extract key biomarkers and potential pathogenic mechanisms from large-scale datasets, laying the foundation for future AI-based prediction tools. Finally, a secure and scalable cloud and visualization platform is being developed to manage data storage and access, provide bilingual query interfaces and interactive analysis tools, and translate complex analytical outputs into intuitive visual summaries, thereby facilitating cross-team collaboration, international engagement, and potential linkage with clinical decision support systems.

In the Center' s inaugural quarter, the first quarter of 2026, the focus has been on building a solid foundation. On the infrastructure side, high-performance computing servers and large-capacity storage systems have been deployed and brought online, providing robust computational and storage resources for AI workloads and large-scale multi-omics data processing. On the data side, the Center has prioritized integration of international public resources and has established systematic workflows for data inventory, standardization, and analysis. To date, curation and preliminary analysis have been completed for multiple public gene expression datasets, including both microarray and RNA-seq data, which are being imported into the KMU ATOMICS platform as seed resources for search and re-analysis. In parallel, additional multi-omics and clinically related public datasets are being systematically collected, preprocessed, and quality-controlled using standardized pipelines, providing an initial test bed for subsequent data integration and methodological development.

According to the current roadmap, the Center aims to expand its integrated multi-omics database over the next three years to more than 2,000 high-quality samples, creating a shared resource that supports long-term accumulation and multidisciplinary collaboration. The Center will also focus on at least two disease areas to develop AI prediction tool prototypes designed for linkage with Clinical Decision Support Systems, testing the real-world value and feasibility of risk stratification and early warning. On the academic and translational fronts, the Center plans to publish at least three SCIE-indexed papers, including one targeting a journal with an impact factor above 10, and to pursue software copyrights or patents for the database platform, strengthening KMU' s international visibility and intellectual property portfolio in precision health and data science. Looking further ahead, the value of subhealth and multi-omics infrastructure will depend on years of continuous data accumulation and methodological refinement. With a decade-scale horizon, the Center will continue to broaden data coverage, refine analytical workflows, and deepen clinical partnerships, so that "treating disease before it manifests" becomes not only an ideal, but a data-driven practice that can be tracked, predicted, and translated into better health outcomes for the population.

Function and task architecture diagram



Clinical Cohort Division

Leader

Prof. Yi-Chang Liu

Deputy Leader

Prof. Hsin-Chih Yeh
Asst. Prof. Pei-Kang Liu

Asst. Res. Fellow Ching-Chih Lin

Multi-Omics Tech Division

Leader

Asst. Prof. Chao-Ju Chen

Deputy Leader

Assoc. Prof. Ying-Chi Lin

Junior Technical Specialist Chung-Ya Wang

Computing Division

Leader

Asst. Prof. Sin-Hua Moi

Deputy Leader

Asst.Prof. Chia-Hsin Liu
Prof. Ping-Ho Chen
Senior Tech. Chung-Cheng Tsai

Asst. Res. Fellow Zhao-Feng Chen

Biomedical Artificial Intelligence Academy Officially Launched, Opening a New Chapter in Smart Healthcare

University-Level Academic Research Institute
Biomedical Artificial Intelligence Academy (BAIA)
R.A. Yi-Xiang Chen / Dean Henry Horng-Shing Lu

With the rapid advancement of artificial intelligence technologies, healthcare systems worldwide are undergoing structural transformation. KMU has officially established the Biomedical Artificial Intelligence Academy and marked its inauguration with a signature interdisciplinary international symposium. Guided by clinical needs, the Academy integrates resources from medicine, engineering, information science, and industry, and is committed to advancing smart healthcare research, cultivating interdisciplinary talent, and translating research outcomes into real-world applications to address the critical challenges facing future healthcare systems.

Artificial intelligence is no longer merely a supporting tool; it is increasingly becoming a core technology indispensable to medical decision-making, disease prediction, and healthcare delivery systems. In the face of rapidly growing volumes of medical data, escalating clinical workforce burdens, and rising demands for precision medicine, healthcare systems are confronting unprecedented structural challenges. Against this backdrop, Kaohsiung Medical University (KMU) established the Biomedical Artificial Intelligence Academy (BAIA), a forward-looking initiative grounded in global trends in medical technology development as well as long-standing needs and experience accumulated through local clinical practice. The founding principle of the BAIA is to begin with medical problems rather than treating technology as an end in itself. The Academy focuses on the practical application of artificial intelligence in areas such as clinical decision support, medical imaging analysis, disease prediction models, smart healthcare, and medical big data analytics. It emphasizes that research design must originate from real clinical needs and that resulting solutions must be understandable, usable, and verifiable within existing healthcare workflows. This positioning enables the Academy to function not only as an academic research unit, but also as a critical hub connecting clinical practice with technological innovation, fostering more effective and meaningful dialogue between the two domains.

In terms of organizational structure and operational model, the BAIA adopts an interdisciplinary integration framework, bringing together clinicians, data scientists, engineers, and biomedical experts to jointly participate in research design, data analysis, and clinical validation processes. Through cross-professional collaboration, the Academy seeks to break down the barriers created by traditional disciplinary divisions, allowing researchers from diverse backgrounds to work toward shared goals using a common language. This approach further facilitates the translation of AI technologies from theoretical models into solutions that can be practically adopted by healthcare systems.

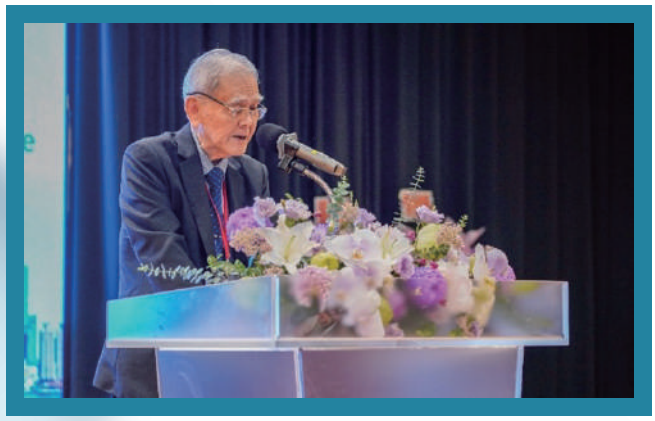
Coinciding with the establishment of the Academy, a signature interdisciplinary international symposium was held, featuring distinguished scholars and experts from Taiwan and abroad. From perspectives spanning medicine, artificial intelligence, policy, and industry, participants engaged in in-depth discussions on how AI is reshaping the future of healthcare. The symposium not only promoted academic exchange, but also served as an important starting point for building international collaboration networks, articulating the Academy's research directions, and deepening cross-disciplinary dialogue. Looking ahead, the Biomedical Artificial Intelligence Academy will continue to advance three core missions. First, it will promote AI biomedical research with clear clinical value, strengthening the evidence base for smart healthcare and ensuring that research outcomes can withstand rigorous clinical validation. Second, it will cultivate interdisciplinary talent equipped with both medical insight and AI capabilities, addressing the evolving structure of the healthcare workforce. Third, it will facilitate effective connections between research outcomes, healthcare systems, and industry partners, accelerating the translation of innovative technologies into real-world clinical and care settings.

The establishment of the BAIA marks a significant milestone in KMU's development of smart healthcare and reflects Taiwan's medical research community's commitment to actively engaging with the global AI wave. With a solid academic foundation and a strong clinical orientation, the Academy will continue to explore how artificial intelligence can genuinely improve healthcare quality, enhance care efficiency, and lay a more resilient foundation for research and application in the future health society.

Group Photo of attendees

Ribbon-cutting ceremony

Speech by Chung-Liang Shih,
Minister of the Ministry of Health and Welfare (MOHW)



Speech by Cheng-Wen Wu, Academician of Academia Sinica

Speech by Chairman Chien-Zie Chen

Speech by Shi-An Chen,
Honorary Dean of Taichung Veterans General Hospital

Speech by President Ming-Lung Yu

Speech by Fang-Ming Chen, Deputy Superintendent of KMUH

Speech by Academy Dean Henry Horng-Shing Lu

Innovative analytical techniques for identifying metabolites of the UV filter homosalate through UPLC–MS: Environmental and health implications

University-Level Academic Research Centers
Research Center for Precision Environmental Medicine (RCPEM)
Asst. Prof. Yi-Shiou Chiou

Regarding the core question of "Which compounds are formed by Homosalate in the human liver?", we used UPLC-MS combined with isotope labeling and three complementary metabolite data processing strategies to establish a technical process that can comprehensively analyze metabolites. Through these methods, we successfully identified nine metabolites of Homosalate, including those known in the literature and new metabolites identified for the first time in this study. This result not only significantly enriches the understanding of Homosalate metabolism in the past but also lays an important foundation for future health risk assessment, environmental exposure monitoring, and toxicological research.

Homosalate: A Common but Discussable Sunscreen Component

In modern life, sunscreen products have become an essential part of daily skincare, and the chemical sunscreen components play a crucial role in protecting the skin. Homosalate (HMS) is currently a widely used UVB absorber in many commercially available sunscreen lotions, skin care products, and cosmetics. Its main function is to reduce skin damage caused by ultraviolet rays. However, recent toxicological studies have indicated that Homosalate may have estrogenic activity and is related to anti-androgenic effects, increasing the discussion on its hormonal interference risks.

An Overview of the Metabolism of Homosalate Sunscreen Component

As people's awareness of the safety of chemical components gradually increases, the health and environmental risks of Homosalate have also begun to attract attention. Currently, Homosalate has been detected in river waters, coastal waters, sediments, indoor dust, and even seafood in multiple research units worldwide; it has also been found in human samples in urine and breast milk. These data indicate that Homosalate has a certain potential for accumulation and circulation regardless of environmental exposure or skin absorption. Therefore, understanding the metabolic pathway of Homosalate in the body has become an important topic in chemical exposure assessment and product safety management.

This study utilized untargeted metabolomics to comprehensively elucidate the metabolic profile of the common sunscreen ingredient Homosalate (HMS) in humans.

Nine potential metabolites were identified, with salicylic acid confirmed as the major product. Addressing the non-specificity of metabolite M4, the structure-specific isomers M14 and M15 are proposed as promising biomarkers for HMS exposure. These findings warrant further validation and provide critical technical support for future environmental health risk assessments.

Research Team Members

Yi-Shiou Chiou, Chia-Lung Shih, Ji-Rui Yang, Min-Feng Tseng, Shin-Yu Yao

Reference

Chiou YS#, Liu CH#, Wu ZH, Tseng MF, Chang SC, Chang YW, Huang CY*, Shih CL*. Innovative analytical techniques for identifying metabolites of the UV filter homosalate through UPLC–MS:
Environmental and health implications. *Environmental Pollution,* **2025**, 386, 127161.

Other Important Highlights

Dr. Da-Wei Wu, Associate Director of our Center and an attending physician in the Division of Pulmonary Medicine at Kaohsiung Municipal Siaogang Hospital, has been awarded the R.O.C. Utility Model Patent entitled “Precision Essential Oil Release Device for Air Pollution Protection. (No. M675962)”

International Collaboration in 2025: Enhancing U.S.–Japan Research Exchange and Capacity Building in Regenerative Medicine Technologies

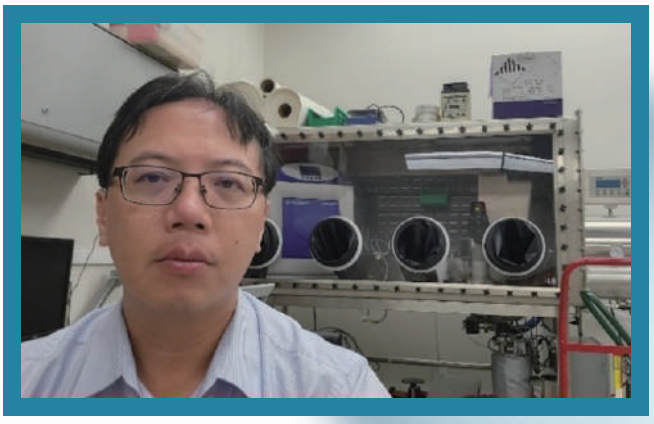
University-Level Academic Research Center
Regenerative Medicine and Cell Therapy Research Center (RCC)
RA Chun-Ya Kao /CEO Chung-Hwan Chen

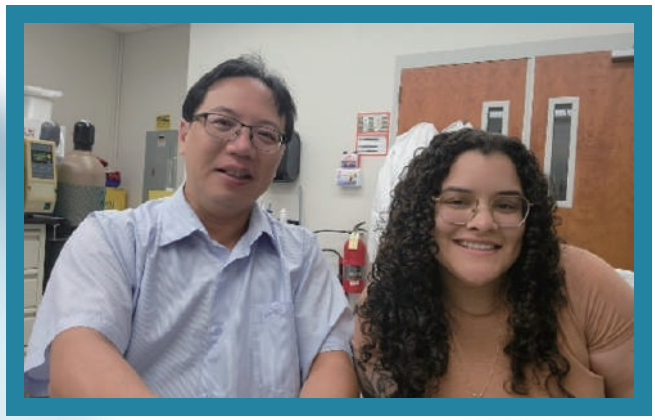
In the fourth quarter of 2025, the RCC continued to place international collaboration at the core of its research and development strategy. In October, Assistant Research Fellow Shun-Cheng Wu visited the University of Miami for academic exchange. With the support and arrangements of Associate Professor Chun-Yuh (Charles) Huang from the Department of Biomedical Engineering, Dr. Wu held meetings with several principal investigators (PIs) from the Department of Biomedical Engineering, the School of Medicine's Department of Orthopaedics, and the Nanofabrication Center. The discussions, involving Professors Ashutosh Agarwal, Courtney Dumont, Dimitrios Kouroupis, and Zhipeng Meng, focused on potential collaborations in regenerative medicine, tissue engineering, and clinical translation, laying the groundwork for future cross-national research partnerships.

During the same period, the Center and the Center for iPS Cell Research and Application (CiRA) at Kyoto University in Japan formally signed a three-year research collaboration agreement, further strengthening substantial cooperation between the two institutions in the field of regenerative medicine. Under this agreement, Postdoc. Dr. Ling-Hua Chang from the Center and Ph.D. candidate Dr. Jin-Wen Hsieh from the Institute of Medicine of our university joined the CiRA laboratories for research training, focusing on the differentiation of induced pluripotent stem cells into nephron progenitor cells and ureteric bud lineage cells. This collaboration enhances the RCC's technical capacity in kidney regeneration and precision medicine research.

In addition, the Center took part in co-organizing the 2025 KMU International Conference on BioMedicine (KMU-ICOBM 2025). The event specially invited Professor Shigetaka Shimodaira from Kanazawa Medical University in Japan as an international keynote speaker to deliver a lecture titled "Future Development and Application Trends of Stem Cell Therapy." His presentation provided insights into the future directions and applications of stem cell therapy, fostering academic exchange among domestic and international scholars while enhancing the global visibility and impact of our university in biomedical research networks.

Group photo of Asst. Research Fellow Shun-Cheng Wu (Middle) with Chair Fabrice Manns (Right) and Assoc. Prof. Chun-Yuh Huang (Left) of the Department of Biomedical Engineering at the University of Miami.





A glove box used by Prof. Chun-Yuh (Charles) Huang to simulate a low-oxygen environment for cartilage research (left), and Prof. Huang' s Ph.D. student Yomi (right), currently conducting glycolysis studies in cartilage.

Prof. Shigetaka Shimodaira delivering a lecture at KMU-ICOBM 2025.

Prof. Shigetaka Shimodaira interacting with the audience during his presentation at KMU-ICOBM 2025.

Other Important Highlights

RCC' s team received the "Clinical Innovation Award" at the 22nd National Innovation Award (2025)

We are proud to announce that members of our Center—Professor Yin-Chih Fu, Professor Chung-Hwan Chen, Professor Yur-Jen Kuo, Professor Chia-Hsin Chen, and Attending Physician Yu-Chen Chen—have been honored with the "Clinical Innovation Award" at the 22nd National Innovation Award (2025). This distinguished recognition highlights the team' s outstanding achievements in translating clinical needs into innovative technological solutions, and showcases the RCC' s excellence in clinical innovation, interdisciplinary integration, and medical application translation.

The award-winning projects span a wide range of applications, including smart medical devices, precision surgical assistance, clinical diagnostic and monitoring technologies, and rehabilitation solutions. These innovations not only address real-world needs encountered in frontline clinical practice, but also demonstrate a high level of originality and strong clinical feasibility, earning unanimous recognition from the award review committee.

The honored achievements further reflect the RCC' s long-term commitment to clinically driven research and cross-domain collaboration among academia, research institutions, and healthcare providers, underscoring the tangible impact of its integrated translational research strategy.translational innovation.

【The award ceremony of the 22nd National Innovation Award】
Teams of Prof. Yin-Chih Fu (front row, 3rd from the right),
Prof. Chung-Hwan Chen (front row, 1st from the right),
Prof. Chia-Hsin Chen (front row, 3rd from the left),
and Attending Physician Yu-Chen Chen(front row, 5th from the left).

【The award ceremony of the 22nd National Innovation Award】
Team of Prof. Yur-Ren Kuo (far right)

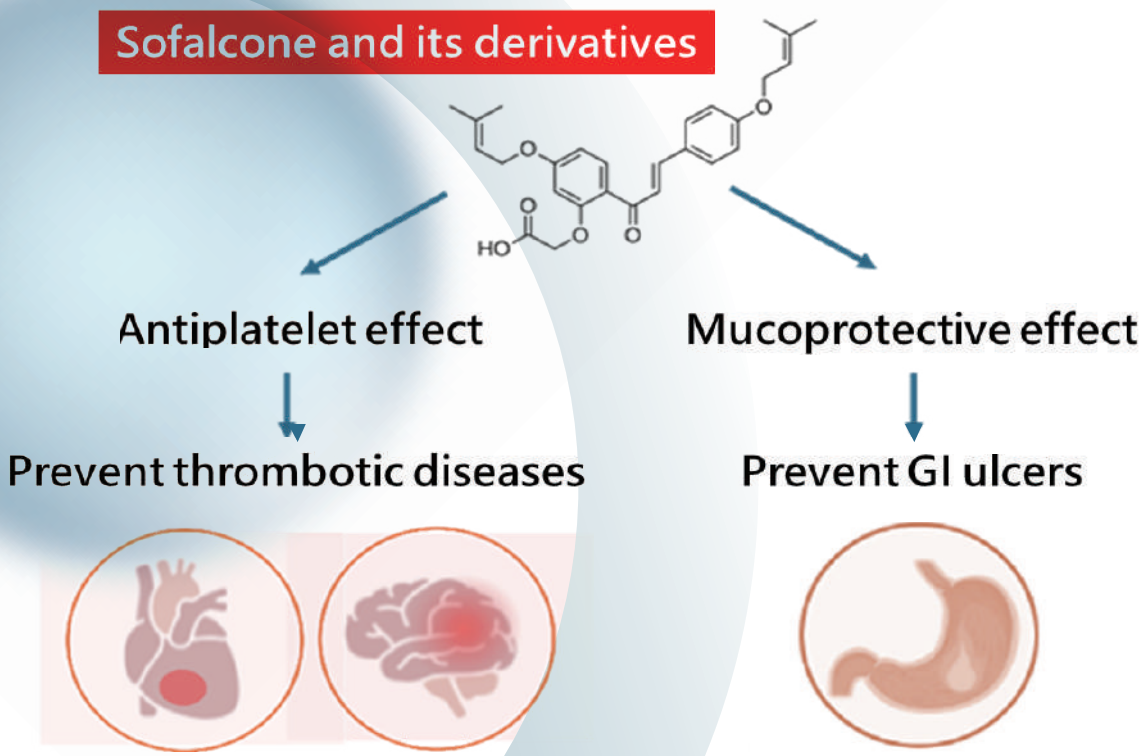
Developing low-bleeding-risk antiplatelet drugs from a gastric mucoprotective drug

University-Level Academic Research Center
Drug Development and Value Creation Research Center(DVCR)
Prof. Chin-Chung Wu

Antiplatelet drugs are a primary treatment for coronary artery disease and ischemic stroke; however, long-term use of antiplatelet drugs can cause gastric mucosal damage and increase the risk of bleeding. Our research team has discovered a clinical gastric mucoprotective drug with antiplatelet activity and is further developing a chemical derivative with stronger potency that does not affect normal hemostasis.

Arterial thrombotic diseases, including coronary artery disease and ischemic stroke, are the leading causes of death worldwide. Since platelets play the most critical role in arterial thrombosis, antiplatelet drugs have become the main treatment for arterial thrombotic diseases. However, the clinical efficacy of the most commonly used antiplatelet drugs, aspirin and clopidogrel, is still limited and may increase the risk of bleeding (especially gastrointestinal bleeding). Clinical studies have shown that gastrointestinal side effects are the main factor affecting the compliance and tolerability of antiplatelet drugs. Therefore, the development of new effective and safe antiplatelet drugs is an important clinical issue that needs to be urgently addressed.

Sofalcone is a gastric mucoprotective drug that has been on the market for over 40 years and has a good long-term safety profile. We have for the first time demonstrated that the mucoprotective drug sofalcone exerts antiplatelet activity through antagonism of thromboxane TP receptor. In a mouse model, sofalcone exhibited antithrombotic activity at the dose required to inhibit alcoholic gastric ulcers without affecting hemostasis. Therefore, sofalcone has the potential to be developed into a new drug for this indication. In addition, Professor Chih-Hua Tseng in our team have synthesized 116 novel sofalcone derivatives. Among them, compound 30 has the best activity and its potency is superior to that of the clinical drugs aspirin and seratrodast (a TP receptor antagonist). Oral administration of the sofalcone derivative in mice inhibited arterial thrombosis without affecting normal hemostasis. Therefore, sofalcone and its derivatives can be developed into effective and safe new antiplatelet drugs for the treatment of arterial thrombotic diseases. Particularly, they are suitable for patients who cannot tolerate aspirin and clopidogrel, such as patients with a history of gastrointestinal ulcers, high bleeding risk, the elderly, and patients resistant to the above drugs.



Our team's research findings have been granted a Taiwan patent, and patent applications are pending in the United States and Japan. This research has received funding from KMU's SPARK Program and is currently undergoing preliminary pharmacokinetic and safety trials. The Ames test results show that compound 30 is not mutagenic. Furthermore, our team has joined an NSTC research project: Artificial Intelligence-Driven Drug Development Pilot Program led by Professor Wan-Long Chuang, combining AI-based drug design, chemical synthesis, pharmacological analysis, pharmacokinetic studies, toxicology research, and clinical medical teams to accelerate drug development.

Other Important Highlights

International Benchmarking Exchange:
Prof. Fang-Rong Chang, Prof. Chih-Hung Chuang, and Prof. Chia-Hung Yen visited the Uppsala Biomedical Centre (BMC) at Uppsala University in Sweden from October 1 to 8, 2025, to discuss future collaborations.

On November 12, 2025, Assoc. Prof. Wen-Wei Lin and Assistant Research Fellow Kai-Wen Ho led Ph.D. students from the Center to Ajou University in South Korea to participate in the 7th AUSOM–KMU Symposium and conduct academic exchanges with Prof. Hyun Goo Woo' s laboratory.

Major Research Grants and Funding

- Prof. Fang-Rong Chang has been awarded a high-level grant from the National Science and Technology Council (NSTC) for the " New Generation of Agriculture for Precision Health " specialized research project (2025).
- Assoc. Prof. Wei-Peng Lee has received prestigious funding from both the Ministry of Education (MOE) "Yushan Young Scholar Program" and the the National Science and Technology Council (NSTC) "2030 Cross-Generation Young Scholars Program."
- Prof. Chia-Lin Kao has been awarded a grant from the National Science and Technology Council (NSTC) under the "Research-Based Entrepreneurship Program (Germination Program)" for the 2026-1 cycle.

Honors and Awards

- Six members of the DVCR were honored as the "World's Top 2% Scientists 2024": Prof. Ya-Ling Hsu, Prof. Yi-Chun Tsai, Prof. Cheng-Che Lan, Prof. Ming-Feng Hou, Prof. Fang-Rong Chang, and Prof. Chin-Chung Wu.
- Prof. Ya-Ling Hsu received the 2025 "Outstanding Research Award" and Assoc. Prof. Wei-Peng Lee received the 2025 "Young Outstanding Research Award" from Kaohsiung Medical University.
- In the 2025 Multiomics and Precision Medicine Joint Conference Poster Competition, 6 students from the center received awards: Shi-Wei Chao, En-Shuo Liu, Shan-Jou Chen, Hsin-Ming Liu, Yi-Chen Yeh, Yu-Tung Chen.
- PrecisemAb Biotech has been honored by the Small and Medium Enterprise Administration, Ministry of Economic Affairs, as one of the “2025 Emerging High-Potential Startups.”

Seminars & Symposia

DVCR hosted the "Symposium on Prevention, Diagnosis, and Treatment of Rare Diseases" on Nov 11, 2025. The event featured distinguished speakers: Dr. Peter Jones (University of Nevada), Dr. Yin-Hsiu Chien (NTUH), Dr. Yen-Lin Chen (TSGH), and Dr. Sunny Sun (NCKU).

Precision Oncology Innovations

University-Level Academic Research Center
Center for Cancer Research (CCR)
Deputy CEO, Hui-Ching Wang

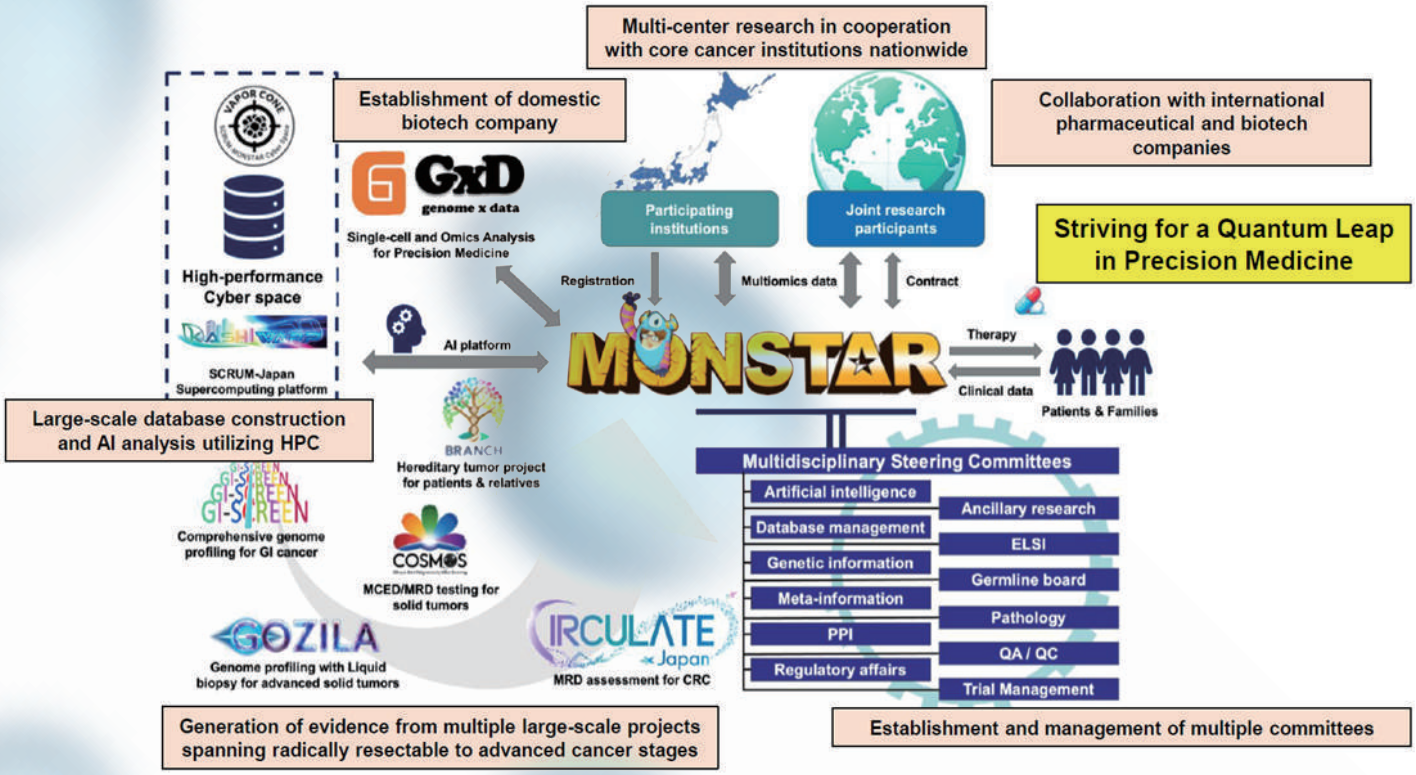
In October 2025, KMU hosted an International Conference on BioMedicine (ICOBM 2025). The keynote speaker, Dr. Takayuki Yoshino of the National Cancer Center Hospital East, presented the SCRUM-Japan/SCRUM-MONSTAR program and its associated studies (GI-SCREEN, GOZILA, TRIUMPH, GALAXY/CIRCULATE-Japan, and multiple biomarker-driven phase II trials). He highlighted how integrating circulating tumor DNA testing with large-scale clinico-genomic registries can accelerate precision oncology by improving patient-to-trial matching, enabling longitudinal treatment monitoring, and supporting more individualized adjuvant therapy decisions through molecular residual disease assessment.

In Oct. 2025, KMU held an an International Conference on BioMedicine (ICOBM 2025). The keynote speaker Dr. Takayuki Yoshino currently works at the National Cancer Center Hospital East in Chiba, Japan, where he is the Deputy Director of Hospital, Head, Division for the Promotion of Drug and Diagnostic Development, and Chief for the Department of Gastrointestinal Oncology. Dr. Yoshino has a particular interest in chemotherapy for gastrointestinal cancers, especially for colorectal cancer, where he focuses on various investigational new agent and translational research regarding potential predictive and prognostic biomarkers. He received his medical degree from the National Defense Medical College and after completing his first residency there, he moved to the National Cancer Center East where he specialized in gastrointestinal oncology. Dr. Yoshino later spent five years at the Shizuoka Cancer Center and during this time, he studied in the USA for a year at several world-renowned institutions, including the Mayo Clinic, Dana-Farber Cancer Institute and the Vanderbilt-Ingram Cancer Center. In 2007 Dr. Yoshino returned to the National Cancer Center East, where he has held senior positions ever since.

Keynote speaker
Dr. Takayuki Yoshino

Dr. Yoshino introduced the SCRUM-Japan/SCRUM-MONSTAR program and its linked studies (GI-SCREEN, GOZILA, TRIUMPH, GALAXY/CIRCULATE-Japan, and multiple biomarker-driven phase II trials) collectively demonstrate how circulating tumor DNA (ctDNA) and large-scale clinico-genomic registries can accelerate precision oncology, improve patient–trial matching, enable treatment monitoring, and refine adjuvant therapy decisions based on molecular residual disease (MRD).

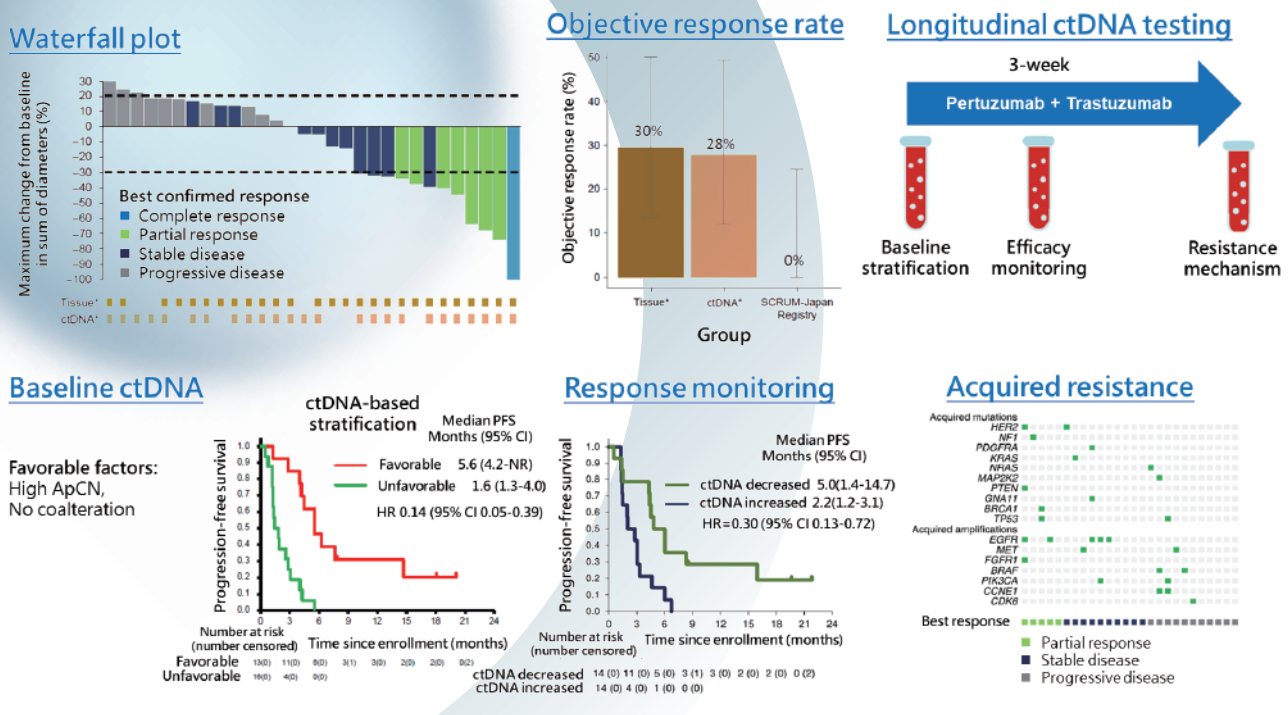
Infrastructure of SCRUM-Japan framework



Dr. Nakamura and Dr. Yoshino established the clinical utility of ctDNA sequencing in advanced gastrointestinal (GI) cancers within the SCRUM-Japan framework (GI-SCREEN and GOZILA). This work showed that ctDNA profiling could identify actionable alterations across tumor types in real-world practice, offering a less invasive alternative when tissue is limited or difficult to obtain. A key contribution was demonstrating feasibility at scale: standardized ctDNA testing integrated into a nationwide screening network can generate actionable genomic information, support enrollment into genotype-matched trials, and provide outcome data to evaluate the real-world impact of matched therapies. The study positioned ctDNA not merely as a biomarker but as an operational tool for building learning health systems in oncology. The study is published in *Nature Medicine* 2020.

Building on that infrastructure, the TRIUMPH trial (Figure 3) evaluated ctDNA-guided therapy with dual HER2 blockade (pertuzumab plus trastuzumab) in HER2-amplified metastatic colorectal cancer (mCRC). TRIUMPH is notable for using ctDNA to identify HER2 amplification and to monitor response and resistance longitudinally. The results supported that ctDNA-based selection can enrich for responders and that serial ctDNA measurements can track treatment effect earlier than conventional imaging in some cases. Importantly, TRIUMPH also highlighted resistance mechanisms that emerge under selective pressure (e.g., alterations in downstream signaling pathways), reinforcing the idea that precision therapy must be coupled with dynamic genomic monitoring. The study is published in *Nature Medicine* 2021.

TRIUMPH trial

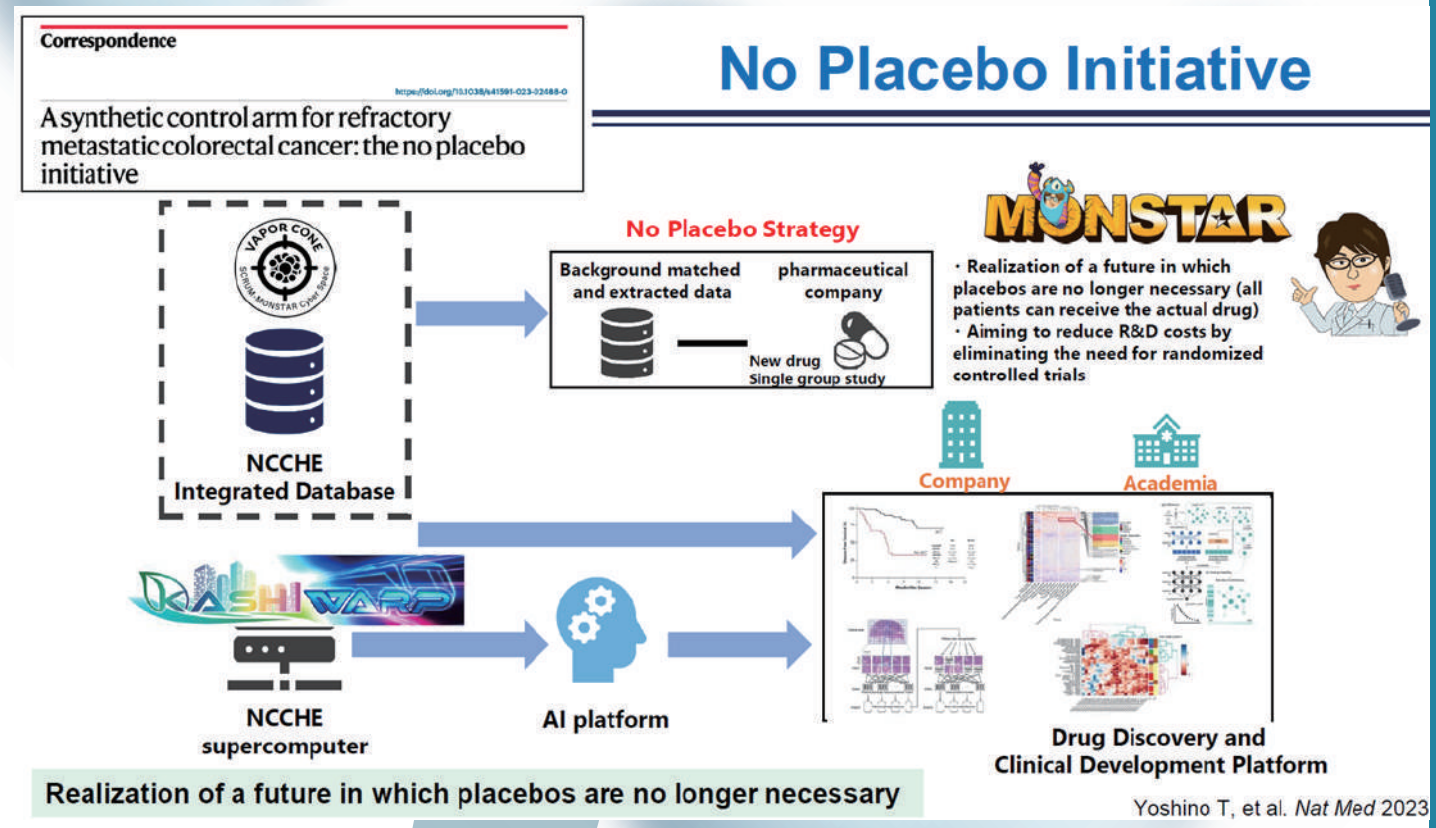


In 2023, a major advance came from GALAXY/CIRCULATE-Japan, shifting ctDNA from advanced disease management to potentially practice-changing use in earlier-stage colorectal cancer. This work focused on MRD detection after curative-intent surgery and its relationship with recurrence risk and adjuvant chemotherapy benefit. The central finding is that ctDNA-positive status after surgery identifies a subgroup with substantially higher relapse risk, while ctDNA-negative patients have a more favorable prognosis. This stratification creates a rational basis for escalation (treat ctDNA-positive) or de-escalation (spare ctDNA-negative) strategies, potentially reducing overtreatment and toxicity without compromising outcomes. The study helped establish MRD as a quantitative, biologically grounded marker that may outperform conventional clinicopathologic risk factors. The study is published in *Nature Medicine* 2023.

Also in 2023, Dr. Nakamura and Dr. Yoshino reported results of SGNTUC-019 in Journal of Clinical Oncology, studying tucatinib plus trastuzumab in previously treated HER2-positive biliary tract cancer (BTC). This basket-study approach illustrates the SCRUM philosophy: identify molecular subgroups within rare or heterogeneous cancers and test targeted combinations efficiently. The trial reinforced that HER2 is a clinically actionable driver in a subset of BTC and that combination HER2 targeting can produce meaningful responses where standard options are limited. Together with other HER2-directed efforts, this work broadened HER2 precision oncology beyond breast and gastric cancers into biliary malignancies.

Dr. Yoshino addressed an enabling methodological challenge for modern precision trials: the “no placebo initiative” and the creation of synthetic control arms using real-world or registry-derived data. In biomarker-driven single-arm trials—common in rare molecular subsets—traditional randomized controls may be infeasible or ethically complex (Figure 4). Synthetic controls, if rigorously constructed, can contextualize efficacy signals and speed evidence generation. This reference ties directly to SCRUM-MONSTAR’ s ability to capture high-quality longitudinal clinical data suitable for external comparators, while also underscoring the need for careful bias control, endpoint harmonization, and transparency. The result is published in *Nature Medicine* 2023.

No Placebo Initiative



The 2024 publications extend these themes. Osumi et al. (*Nature Communications* 2024) analyzed clinical features associated with "NeoRAS wild-type" mCRC in a GOZILA substudy, leveraging ctDNA to characterize tumors that appear RAS wild-type after prior detection or treatment-driven clonal shifts. This line of work matters because anti-EGFR therapy benefit hinges on accurate RAS status; ctDNA can reveal dynamic changes and guide rechallenge strategies or sequencing decisions. Such studies exemplify how ctDNA can capture tumor evolution in real time and refine patient selection for established targeted agents, not only novel drugs.

Dr. Hashimoto, Dr. Nakamura, and Dr. Yoshino synthesized the SCRUM-MONSTAR cancer-omics ecosystem, emphasizing the organizational and technical elements required to make precision medicine scalable: nationwide participation, standardized testing, integrated databases (including high-performance computing platforms), industry–academia collaboration, and tight coupling of screening with interventional trials. This ecosystem paper provides the systems-level rationale for why SCRUM has generated multiple impactful trials—because it treats genomics, clinical data, and trial operations as one connected pipeline.

Two *JCO* 2024 phase II studies expanded HER2-directed antibody–drug conjugate (ADC) therapy. Yagisawa et al. (*HERALD*; Aug 1, 2024) evaluated trastuzumab deruxtecan (T-DXd) in advanced solid tumors with HER2 amplification detected by plasma cfDNA, demonstrating that ctDNA-defined HER2 amplification can identify patients who derive substantial benefit from ADC therapy across tumor types. Ohba et al. (*HERB*; Aug 5, 2024) focused on HER2-expressing BTC and similarly supported T-DXd activity, strengthening the argument that HER2 expression/amplification can be actionable in BTC and that ADCs may overcome limitations of earlier HER2 strategies in some contexts.

Finally, Kataoka et al. (*Annals of Oncology* 2024) further examines MRD-guided benefit of adjuvant therapy in the specific high-risk setting of resected colorectal liver metastases. Collectively, these later studies push ctDNA from feasibility and association into decision-impact territory: identifying who should be treated, with what, and when, based on molecular evidence rather than population averages.

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Highlights of the Development and Promotion of Precision Sports Medicine

University-Level Academic Research Center
Precision Sports Medicine and Health Promotion Center (PSMHPC)
RA Chan-Chih Hsu / CEO Lan-Yuan Kuo

Over the past 3 months, the PSMHPC has actively advanced academic research, international engagement, and health promotion initiatives, demonstrating its integrated strengths and growing impact in the fields of sports medicine and health sciences. In terms of international collaboration, the Center participated in and co-organized two international symposia focusing on sports medicine, athletic performance, and health promotion. These events brought together domestic and international experts for academic exchange, further enhancing research collaboration and KMU' s global visibility.

With regard to research development, the PSMHPC has supported the organization of research findings and submissions to international journals through team-based collaboration and publication support mechanisms. These efforts have fostered interdisciplinary partnerships, nurtured early-career researchers, and strengthened overall academic impact. In addition, the Center, in collaboration with the Center for Sports Injury Prevention & Fitness, hosted a 5-day Sports Medicine Week that engaged faculty, staff, and members of the public. Through activities such as physical training, sports injury prevention, and health promotion programs, the event helped raise awareness of exercise safety and improve health outcomes, putting the principles of preventive medicine into practice.

Looking ahead, the PSMHPC will continue to integrate resources across research, education, and service to further develop applications in precision sports medicine, while playing a key role in academic innovation, talent cultivation, and the promotion of public health.

The PSMHPC continues to advance interdisciplinary research development, achieving a growing body of research outcomes across sports medicine, clinical medicine, and smart health. Multiple papers have been successfully published in internationally recognized journals indexed in SCIE, SSCI, EI, and TSSCI. Research topics span athletic performance, clinical prediction, AI in healthcare, and health promotion, demonstrating the Center' s consistent productivity and strength in interdisciplinary integration and international academic research.

In the area of elite sports performance and special task applications, the research team collaborated with the National Defense Medical Center and the Aviation Physiology Training Center of the Armed Forces to conduct interdisciplinary research combining sports medicine and aerospace medicine. The results were published in *Medicine & Science in Sports & Exercise*, the official journal of the American College of Sports Medicine (ACSM) and a top 10% journal in the field of sports science. The study showed that the Cardiac Force Index (CFI) during walking effectively predicts tolerance to high G-forces, and identified sprint performance and lower-limb explosive power as key contributing factors. These findings further proposed a feasible model for the preliminary screening of flight trainees and the design of individualized aviation training programs using non-invasive physical and physiological indicators, demonstrating strong potential for practical application.

In the field of sport-specific training and injury prevention, the research team focused on the emerging Olympic sport of sport climbing, comparing the immediate effects of different warm-up strategies on upper-limb flexibility, muscle strength, and dynamic stability. The results, published in the *Journal of Sports Science and Medicine*, indicated that different warm-up approaches exhibit distinct strengths in functional performance. These findings provide a scientific basis for the design of warm-up strategies in climbing-specific training, pre-competition preparation, and rehabilitation practice, and were recognized with an Excellence Award from the Ministry of Sports for Sports Science Research and Talent Development in 2025.

In terms of intelligent healthcare and clinical decision support, the research team applied artificial intelligence and machine learning technologies to develop several models with strong clinical application potential. These included a non-invasive vascular sound monitoring system combined with AI algorithms to assist in predicting the timing of arteriovenous fistula occlusion in hemodialysis patients, as well as the use of XGBoost machine learning models to identify key prognostic factors influencing the effectiveness of extracorporeal shock wave therapy for calcific tendinitis of the shoulder, thereby supporting clinical treatment decision-making and healthcare resource allocation.

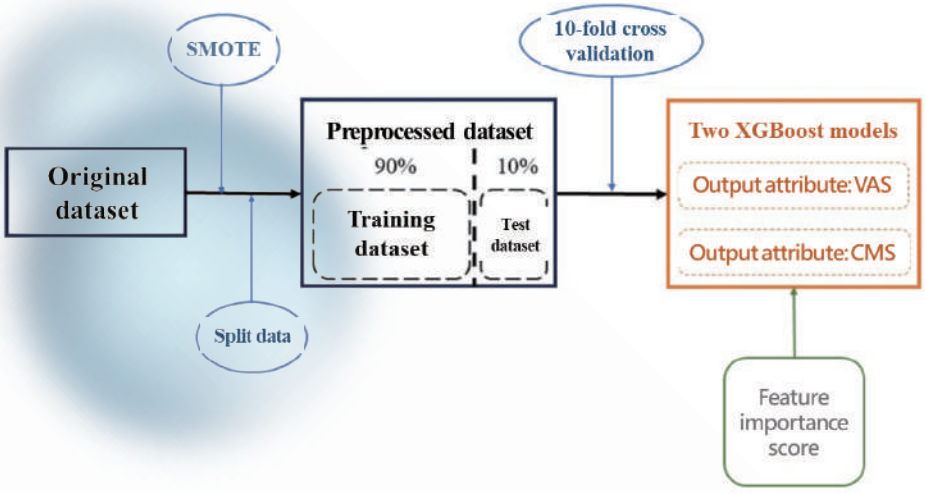
The research outcomes also extended to campus-based and older-adult health promotion settings. The team developed a non-contact screening approach based on jaw movement trajectories and diadochokinetic performance to identify older adults at high risk of oral functional decline. The related findings were published in BMC Oral Health, demonstrating the Center' s research strength in non-invasive functional assessment and early screening model development for aging populations.

In addition, through systematic review and meta-analysis, the research team evaluated the effects of orienteering exercise interventions on physical fitness and cognitive function. The results, published in Public Health, provide high-level evidence supporting exercise interventions for physical and mental health promotion, and serve as an important reference for implementing exercise-based health promotion strategies in schools, communities, and public health settings.

At the level of basic biomedical research, the research team also investigated the protective effects of natural bioactive compounds against chemotherapy-induced skeletal muscle atrophy and mitochondrial dysfunction. The findings suggest potential applications in regulating energy metabolism, reducing oxidative stress, and modulating cellular aging–related mechanisms, providing scientific evidence for the prevention of treatment-related side effects in cancer therapy.

Overall, the research achievements in 2025 clearly demonstrate the PSMHPC' s integrated strengths in precision exercise medicine, translational clinical research, and intelligent health technologies. The research outputs span elite sports performance, clinical medical applications, and community health promotion, reflecting the Center' s concrete efforts and sustained momentum in research and development.

Deputy Director Nai-Jen Chang received an Honorable Mention in the 2025 Sports Science Research and Talent Development Awards presented by the Ministry of Sports.



Flow chart of construction prediction model using XGBoost algorithm. *XGBoost*, eXtreme Gradient Boosting; *VAS*, visual analog scale; *CMS*, Constant-Murley score; *SMOTE*, synthetic minority oversampling technique.

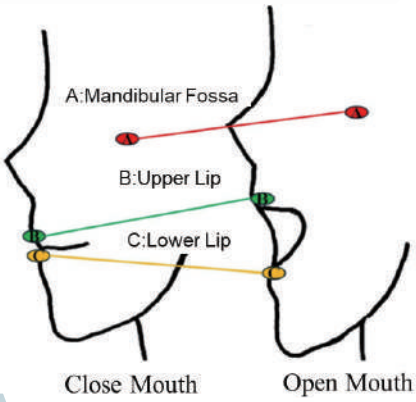
Negative prognostic factors and clinical improvement prediction modeling for extracorporeal shock wave therapy in calcific shoulder tendinitis using artificial intelligence techniques, published in the *Journal of Shoulder and Elbow Surgery*.

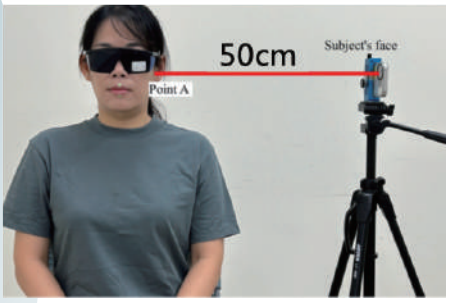
The DW exercises.

VR exercises.

CW exercises

A study Comparing The Effectiveness of 10 Minute Dynamic Stretching, Vibration Rolling, and Climbing Specific Warm Ups on Exercise Performances in Rock Climbers in the *Journal of Sports Science and Medicine*.





Development of a non-contact screening approach for identifying oral function high-risk older adults using jaw movement and diadochokinetic performance published in *BMC Oral Health*.

The Invisible Burden: How Do We Measure the Severity of MASLD?

University-Level Academic Research Center
Center for Metabolic Disorders and Obesity (CMDO)
Postdoc. Edward Hsi / CEO Prof. Wang-Long Chuang

Metabolic dysfunction–associated steatotic liver disease (MASLD) is a chronic condition that progresses silently and is often underrecognized. Although many individuals remain asymptomatic in the early stages, MASLD is closely associated with diabetes, cardiovascular disease, kidney disease, and advanced liver outcomes, including cirrhosis and liver cancer.

Using the concept of disease burden, this work integrates large-scale biobank data, health insurance records, and health examination databases to systematically assess the population impact of MASLD. Key indicators include prevalence, incidence, severe complications, and mortality risk. Geographic information system (GIS) mapping is used to identify high-risk regions and support evidence-based decision-making.

By combining national trend analyses with local demonstration projects, our center aims to translate research findings into actionable precision public health strategies and to support the development of more targeted metabolic health policies in Taiwan.

Some diseases are concerning not because they occur suddenly, but because they persist over time without being noticed.

Metabolic dysfunction–associated steatotic liver disease (MASLD) is a clear example. Most patients do not experience obvious symptoms in the early stages, and liver function tests may remain within normal ranges. Nevertheless, the disease often progresses quietly, gradually accumulating damage. When clinical problems finally become apparent, they are frequently accompanied by poor glycemic control, cardiovascular events, declining kidney function, and advanced liver outcomes such as fibrosis, cirrhosis, or hepatocellular carcinoma.

For this reason, both public health planning and clinical decision-making must begin by addressing a seemingly simple but critical question: How severe is MASLD at present?

Closely following this is an equally important question: How can we know?

When “Severity” Must Be Quantified: From Clinical Impressions to Actionable Indicators

Within healthcare and public health systems, disease severity cannot rely solely on clinical impressions from individual cases. Instead, it must be translated into measurable indicators that can be tracked, compared, and used to inform decisions. In the case of MASLD, disease severity is best understood across several complementary levels.

The first level concerns the scale of the disease within the population, that is, how many people are affected. This includes prevalence, which describes the proportion of individuals with fatty liver disease or meeting MASLD criteria at a given point in time, as well as incidence, which reflects how many people newly develop the disease each year. This level captures the overall reach of MASLD across the population.

The second level focuses on clinical outcomes and disease progression. MASLD is not limited to fat accumulation in the liver; it may progress to liver fibrosis, cirrhosis, and liver cancer. It is also closely associated with diabetes, cardiovascular disease, chronic kidney disease, and thoracic-related conditions. Clinical outcomes such as hospital admissions, emergency department visits, and mortality reflect the direct impact of MASLD on both health systems and patient survival.

The third level addresses the overall consequences of these outcomes, including healthcare expenditures, length of hospital stay, long-term medication use, and indirect effects such as productivity loss, caregiving burden, and impacts on families. While clinicians usually observe only a small part of these consequences in outpatient care, policy makers must consider their effects at the societal level. This need gives rise to the concept of disease burden.

What Is Disease Burden? Turning Impact Into Comparable Weight

Disease burden is a systematic approach that integrates the effects of disease on health, healthcare systems, and society into a form that can be measured, compared, and followed over time. Through disease burden analysis, we can address key questions: How does MASLD compare with other chronic diseases in terms of its impact on population health? Which regions and population groups face higher risks? After screening programs, health education, lifestyle interventions, and medical resources are implemented, does the overall burden change?

In practice, our center currently focuses on several foundational indicators, including the prevalence and incidence of MASLD, severe disease and complications (such as liver fibrosis, cirrhosis, hepatocellular carcinoma, and cardiovascular events), and mortality-related outcomes. We also assess premature death using years of life lost (YLL). In other words, the core purpose of disease burden assessment is to convert the impact of disease into information that can be quantified, compared, and monitored.

From Databases to Communities: Building a More Precise Picture

Relying solely on case data from a single hospital may overestimate severe disease while underestimating individuals with undiagnosed or mild conditions in the community. On the other hand, population surveys alone often lack detailed clinical outcomes and long-term follow-up. To address these limitations, our center adopts a research strategy that combines database-based estimation with local data calibration, allowing results to better reflect real-world conditions.

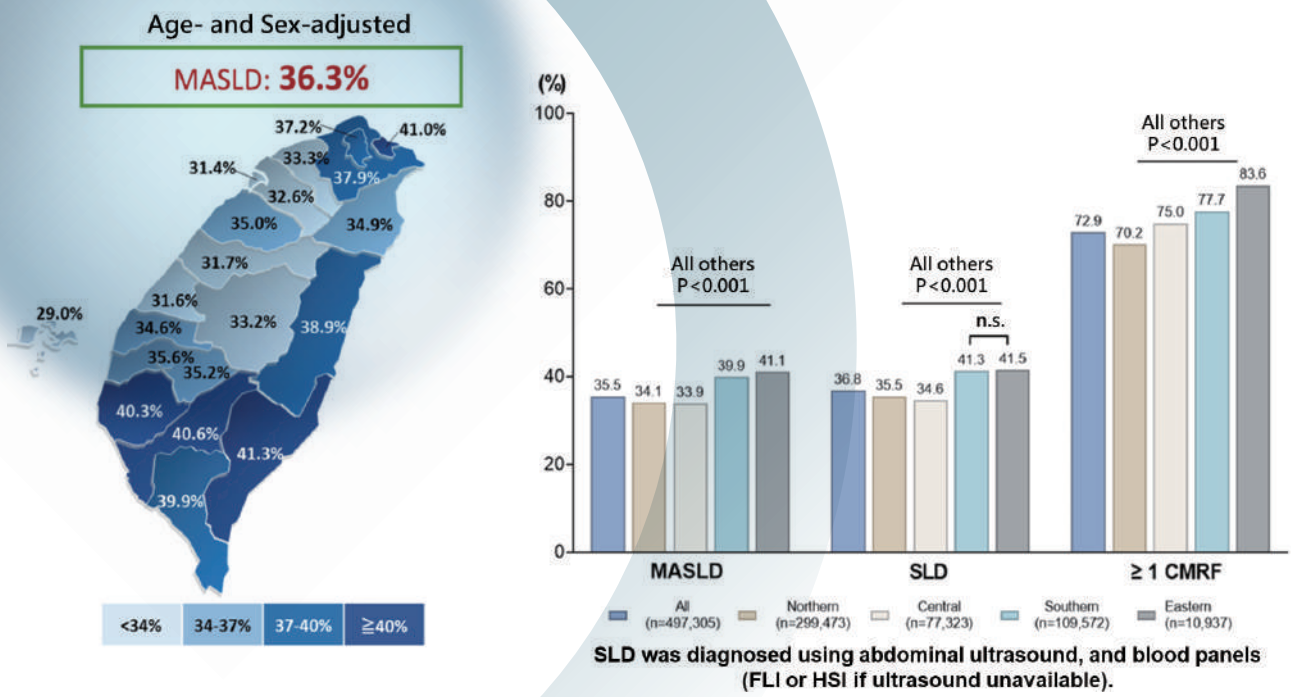
We integrate several large and representative data sources, including the Taiwan Biobank and the MJ Health Screening Biobank, linked with the National Health Insurance Database. These datasets provide information on healthcare visits, medication use, diagnoses, laboratory testing, imaging, hospitalizations, and surgical procedures. Through these analyses, we are able to identify populations with metabolic abnormalities, individuals with evidence of fatty liver, and those who have already developed fibrosis or other clinical complications.

Our findings indicate that MASLD risk is not evenly distributed across the population, but instead shows clear geographic clustering. Therefore, we further incorporate these data into a geographic information system (GIS) to create disease risk maps that support decision-making. These maps allow us to examine MASLD prevalence, complication rates, and hospitalization patterns across administrative regions, and to assess whether current healthcare resources and health promotion efforts align with areas of highest risk. The purpose of these maps is practical: to determine where resources should be prioritized and where interventions should begin.

From National Trends to Local Demonstration: Toward Actionable Health Strategies

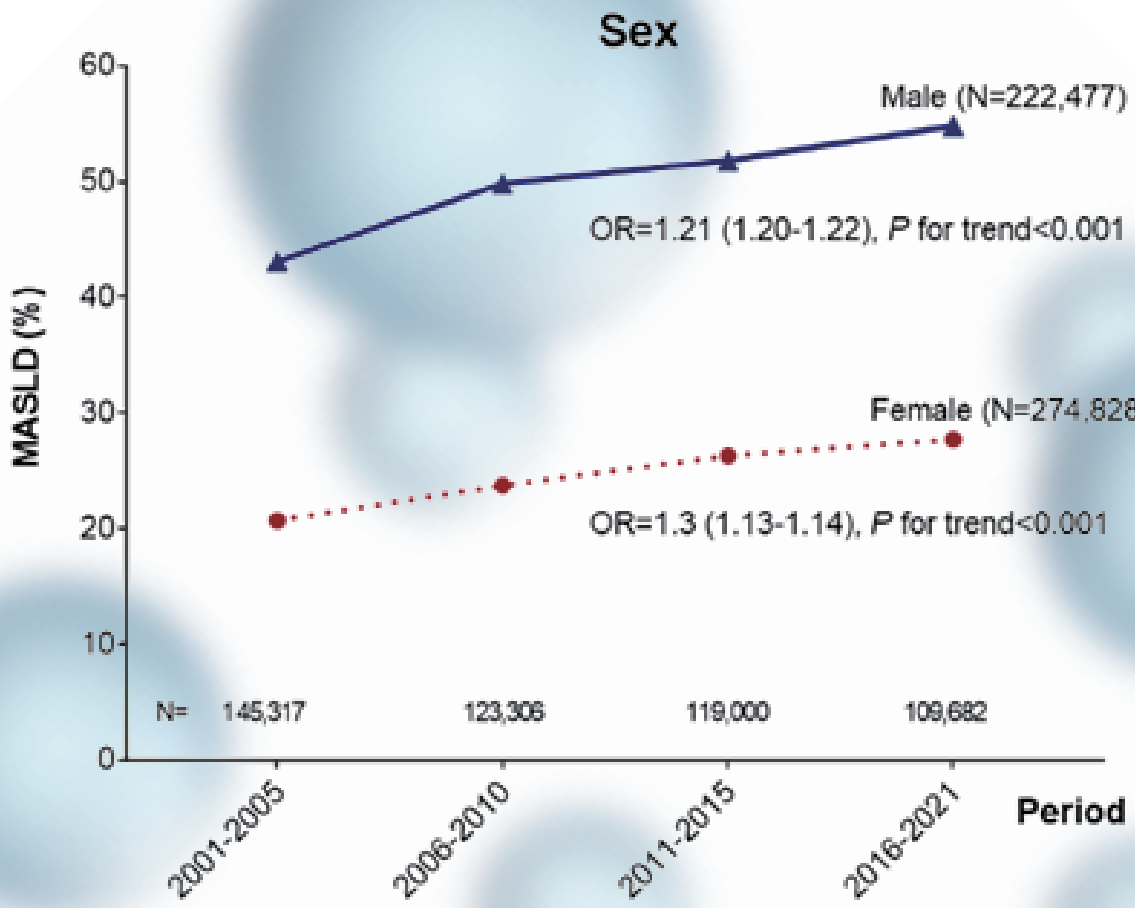
By integrating data from the Taiwan Biobank and the MJ Health Screening Database, our center analyzed records from 497,305 individuals between 2001 and 2021. The average age of participants was 42.1 years, and 55.3% were female. The overall prevalence of MASLD in Taiwan was estimated at 36.3%. Mapping prevalence by administrative region revealed higher-risk areas in southern and eastern Taiwan, indicating regions that warrant particular attention. Trend analyses further showed that MASLD prevalence was consistently higher among men and increased significantly over time in both men and women.

Geographic distribution of MASLD prevalence in Taiwan.



SLD was diagnosed using abdominal ultrasound, and blood panels (FLI or HSI if ultrasound unavailable).

Annual increase in MASLD prevalence over time.



After identifying national-level risk patterns and trends, we further sought to obtain more detailed, community-level data to support precision public health strategies. Initial efforts focused on collaboration with township-level health authorities in Pingtung County. This work integrates community screening and health examination results, registries for metabolic syndrome, hypertension, and diabetes management, as well as indicators of coverage and effectiveness of health promotion programs. Through this process of local calibration, we are gradually developing disease burden maps into tools that can be designed, implemented, and evaluated as part of city-level health strategies, with the goal of scaling this model nationwide.

The challenge of MASLD lies in its long-standing silence. The responsibility of our center is to make this silence measurable, to identify where risks are concentrated, and to establish clear priorities for intervention. By starting with disease burden, we aim to help society understand how serious MASLD truly is. Disease mapping then serves as a key tool for translating research findings into concrete action. Through this integrated approach, we seek to support the development of more forward-looking and precise metabolic health policies for Taiwan.

Protecting Brain Health from Age 40: A Major Breakthrough in Dementia Prevention through Integrated Policy, Research, and Health Action

University-Level Mission-Oriented Research Center
Neuroscience Research Center (NRC)
Director Yuan-Han Yang

As population aging accelerates, dementia prevention in Taiwan has entered a new phase that emphasizes prevention rather than care alone.
In 2025, the Ministry of Health and Welfare, the National Health Research Institutes (NHRI), Novo Nordisk Taiwan, and Prof. Yuan Han Yang , Director of the Neuroscience Research Center jointly released Taiwan' s first Dementia Risk Factor Management White Paper. This landmark initiative highlights age 40 as a critical window for dementia prevention and integrates the Five Rules for Brain Health, the Long-Term Care 3.0 policy framework, and cross-sector collaboration strategies. Together, these efforts promote population-wide health management, effectively reduce dementia risk, and enhance quality of life.

Policy and Research Background of Dementia Prevention

The number of people living with dementia in Taiwan continues to rise and is projected to pose significant challenges to families, healthcare systems, and social resources in the future. In response, government agencies and research institutions have actively promoted prevention-oriented policies, emphasizing the importance of initiating health management strategies beginning in midlife.

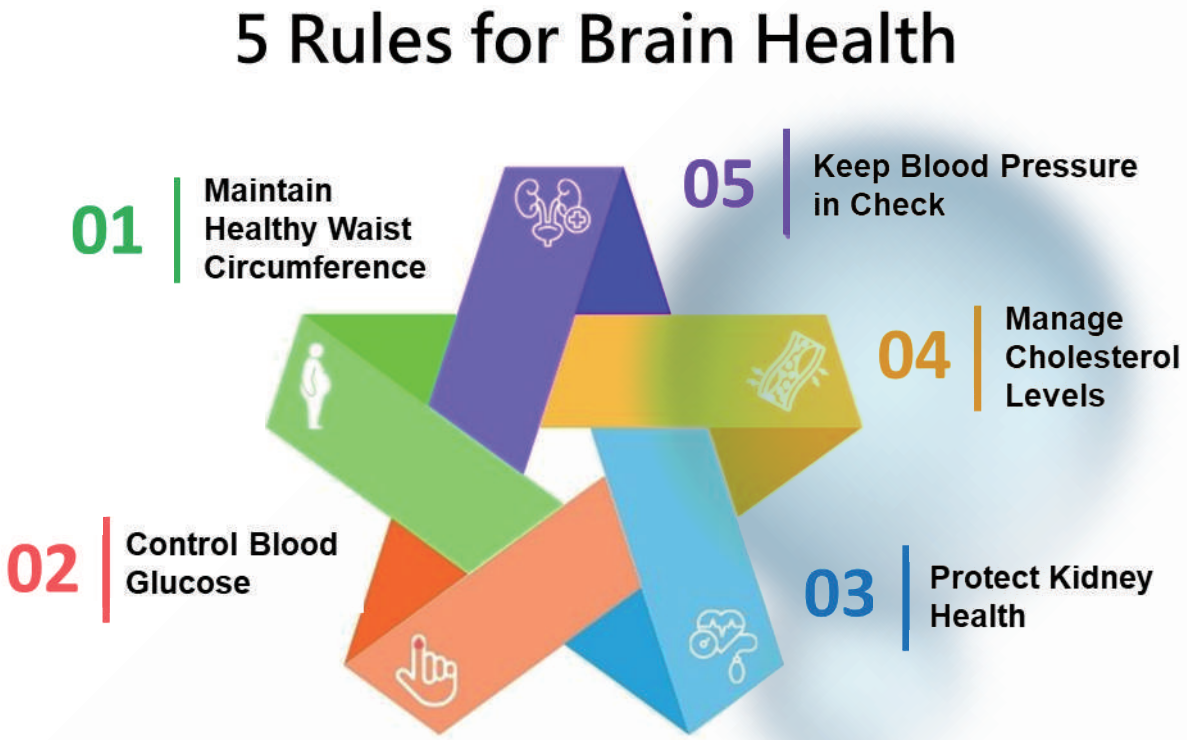
Dementia Prevention Policy Framework

Dementia Prevention Policy Framework

Research indicates that most dementia risk factors are modifiable, including obesity, blood glucose, blood pressure, blood lipids, and kidney health. By synthesizing domestic and international research evidence, the NHRI proposed the "Five Rules for Brain Health" as practical and actionable guidelines that can be implemented in daily life to reduce dementia risk.

The Five Rules for Brain Health include:
- **Maintaining a healthy waist circumference**
- **Controlling blood glucose**
- **Preventing excessive blood pressure**
- **Managing cholesterol levels**
- **Protecting kidney health**

Visual Representation of the Five Rules for Brain Health



Public–Private Partnerships and Cross-Sector Collaboration Outcomes

To accelerate the translation of research findings into real-world practice, the NHRI has partnered with industry stakeholders to promote dementia risk management and chronic disease prevention strategies. This collaborative model integrates scientific research capacity with industrial resources, facilitating the alignment of policy development, academic research, and practical implementation.

NHRI collaborated with multidisciplinary experts to publish
Taiwan' s first Dementia Risk Factor Management White Paper,
marking a significant milestone in cross-sector dementia prevention efforts.

Press Released

National Health Research Institutes (NHRI)
https://www.nhri.edu.tw/News/more?id=c72ea49654444a3d9b096b707a439bdf
Common Health Magazine
https://www.commonhealth.com.tw/article/93069
Gene online
https://geneonline.news/nhri-and-novo-nordisk-on-dementia-prevention/

Interdisciplinary Health Protection: Breakthroughs in Rodent-Borne Disease Diagnosis, Glycemic Monitoring for PLWH, and Novel Antifungal Therapies

University-Level Mission-Oriented Research Center
Center for Tropical Medicine and Infectious Disease Research (TMED)
RA Jou-An Pan, Yung-Mei Chao /Director Chun-Yu Lin

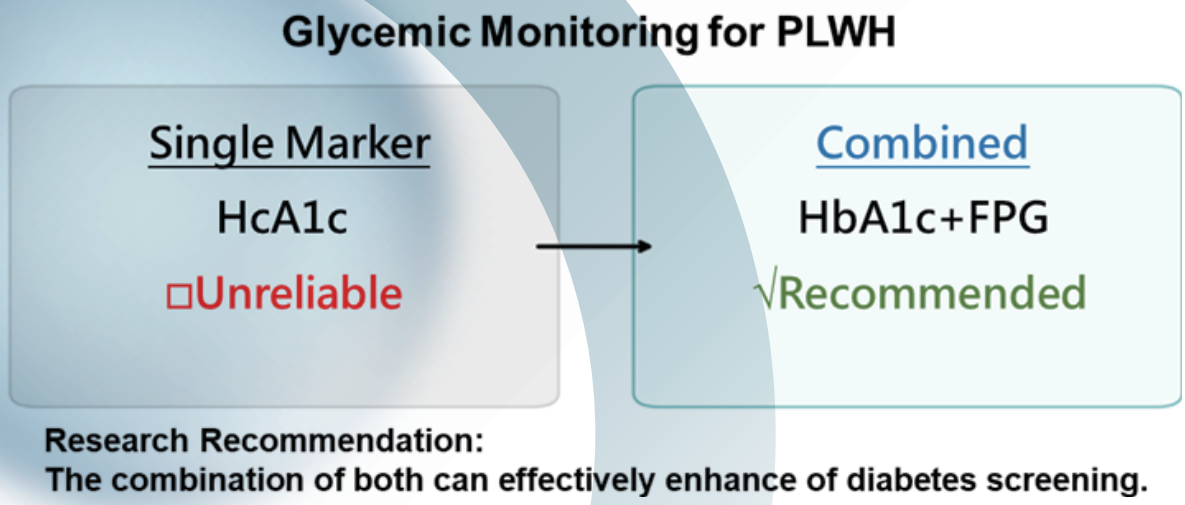
This column integrates three research highlights: First, identifying key markers to distinguish between Leptospirosis and Hantavirus infections. Second, evaluating glycemic assessment tools for PLWH and recommending a combined screening approach. Third, developing a novel silver ion (Tau-Ag) therapy to combat multidrug-resistant Candida infections

Precision Differentiation of Rodent-Borne Diseases

Leptospirosis (LS) and Hantavirus (HV) are both rodent-borne diseases that share similar clinical manifestations, such as fever, thrombocytopenia, and acute kidney injury, posing significant diagnostic challenges for physicians. Our retrospective study in Southern Taiwan found that elevated bilirubin levels, microscopic hematuria, or the presence of shock significantly suggest a preferred diagnosis of Leptospirosis over Hantavirus. These findings provide critical clinical guidance for epidemic prevention and treatment in the region.

New Insights into Glycemic Monitoring for PLWH

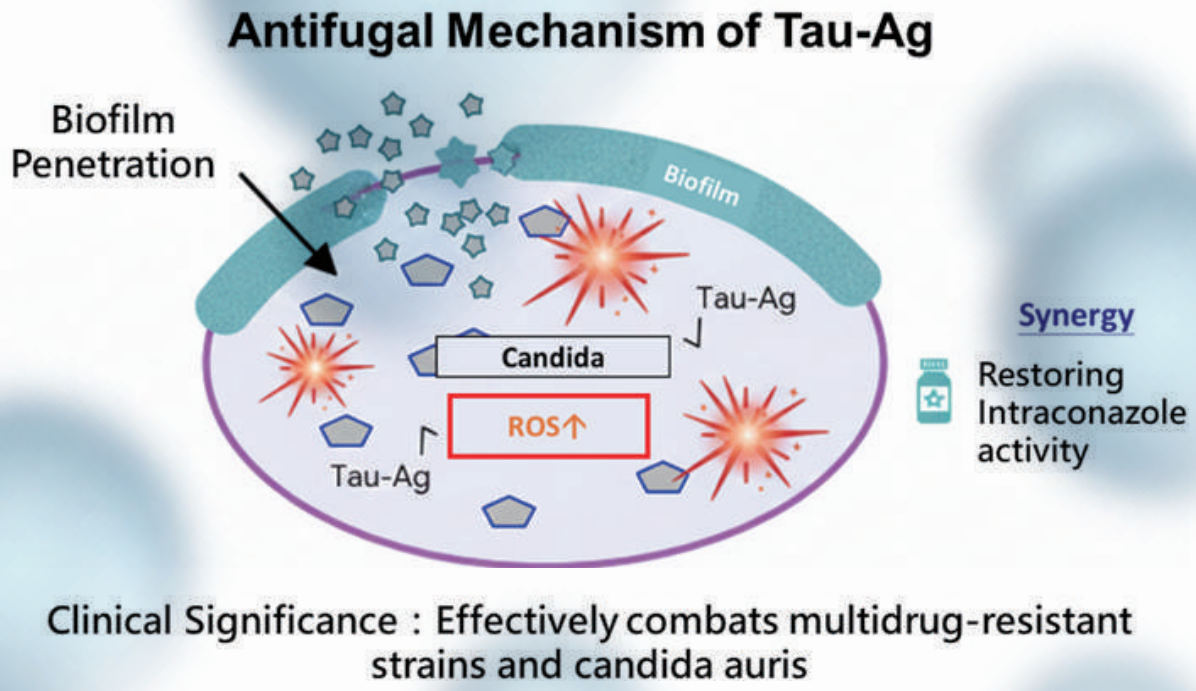
People living with HIV (PLWH) face an increased risk of metabolic disorders, yet traditional glycemic markers like hemoglobin A1c (HbA1c) may be unreliable due to altered red blood cell turnover. Our research indicates that neither HbA1c nor glycated albumin (GA) alone reliably captures glycemic abnormalities in this population. Specifically, low mean corpuscular volume (MCV <80 fL) was identified as an independent predictor of mismatch between these markers. To enhance screening accuracy for prediabetes and diabetes, a combined approach incorporating fasting plasma glucose (FPG) is highly recommended.



**New Trends in Glycemic Monitoring for PLWH.
This figure illustrates HbA1c shows relevance within the population of PLWH.
It is recommended to combine it with fasting plasma glucose (FPG)
in a comprehensive assessment approach
to achieve more accurate monitoring indicators.**

Overcoming Drug Resistance: Novel Tau-Ag Antifungal Therapy

The rapid increase in azole-resistant and multidrug-resistant (MDR) Candida species, including the emerging pathogen Candida auris, represents a global health threat. Our center has evaluated the antifungal activity of taurine-induced silver ions (Tau-Ag). Tau-Ag has been shown to significantly increase reactive oxygen species (ROS) levels within Candida cells and effectively penetrate and eliminate biofilms. Furthermore, Tau-Ag exhibits a synergistic effect when used in combination with itraconazole, restoring the drug's activity against resistant strains while maintaining a high safety profile in in vivo models.



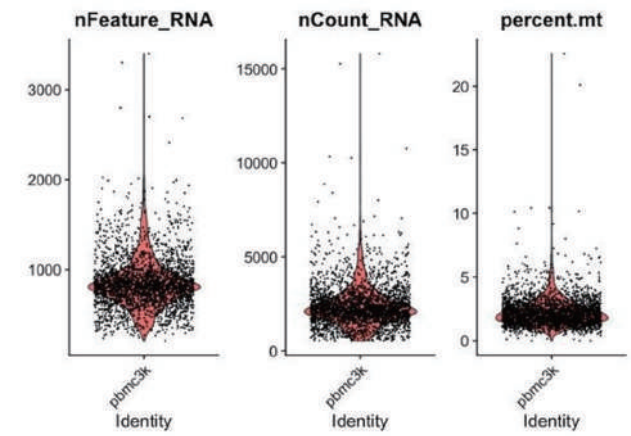
Antifugal mechanism of Tau-Ag
This figure illustrates the process by which taurine induces silver ion particles to penetrate the Candida biofilm and induces an increase in intracellular reactive oxygen species (ROS), demonstrating its potential as a novel antifungal treatment strategy.

Genomics Data Analysis Course: Applications and Analysis of Whole-Genome Transcriptomics and Machine Learning in Genetic Research

University-Level Mission-Oriented Research Center
Center for Big Data Research
Director Hung-Pin Tu

Single-Cell Transcriptomics Analysis Practice

This course provides hands-on scRNA-seq training using 10x Genomics PBMC datasets. Students master Seurat for data loading, QC/filtering (mito genes, counts), doublet removal (DoubletFinder), normalization, HVGs, PCA/UMAP, clustering, marker-based annotation (e.g., MS4A1, CD14 for T/B/monocytes), and GO functional enrichment—progressing from raw data to biological insights.



Load the PBMC dataset, which is typically provided as a folder containing three files: barcodes.tsv, features.tsv (or genes.tsv), and matrix.mtx.

After basic data cleaning, the course explores standardized preprocessing: normalization, highly variable gene (HVG) selection, scaling, and dimensionality reduction techniques like PCA and UMAP—detailing their mathematical logic and biological relevance. Students learn to visualize high-dimensional data for cell population differences.

Next, the core clustering and cell type annotation unit uses unsupervised algorithms for clustering, with marker genes (e.g., MS4A1, CD14) to identify clusters, mapping PBMC composition (T cells, B cells, monocytes).

Finally, functional enrichment analysis via Gene Ontology (GO) examines pathways like cellular respiration, immune response, and metabolism. Overall, the course emphasizes the full pipeline from raw data to biological insights for single-cell big data research.

Lecture by Prof. Min-Shan Ko "Application and Analysis of Genomic Transcriptional Science and Machine Learning in Gene Research" given on Nov. 7 & 14, 2025.

Reframing Geriatric Care: Integrated Strategies Centered on Frailty

University-Level Mission-Oriented Research Center
Center for Long-Term Care Research (CLTCR)
RA Shih-Chien Chang, Fang-Ru Yueh / Director Yi-Chun Tsai

The CLTCR hosted a professional forum titled “Frailty Assessment, Intervention, and Exercise Prescriptions for the Elderly” on October 18, 2025, partnering with the Taiwan Association of Gerontology and Geriatrics, Department of Geriatric Medicine of KMUH, and the PSMHPC. The event invited Professor Kenneth Rockwood, a globally recognized authority in geriatrics, to join domestic experts in discussing frailty assessment tools, digitalizing acute-to-long-term care transitions, and customized exercise and nutrition plans. This interdisciplinary dialogue deepened the care team's perspective on frailty as both assessable and modifiable. By reinforcing integrated care models focused on function and quality of life, the forum serves as a cornerstone for the Center’ s ongoing efforts in geriatric care integration and professional development.

This event centered on core issues in geriatric care, facilitating knowledge exchange between international and domestic experts to enhance the long-term care system’ s systematic understanding and practical application of frailty.

The forum covered four key areas, including the reframing of frailty concepts, the clinical application of assessment tools, digital integration across acute and long-term care settings, and exercise/nutritional intervention strategies. These insights significantly contribute to the Center's and its affiliated long-term care units' efforts in integrated care, functional maintenance, and the improvement of quality of life. The key highlights and professional contributions of the forum are as follows:

I.Reframing Frailty Concepts and Geriatric Care Models

The forum invited Professor Kenneth Rockwood, a global authority in geriatric medicine, to present on “Understanding Frailty: Reframing Geriatric Care Thinking.” He emphasized that frailty is not an irreversible consequence of aging but rather a risk state that is quantifiable, gradable, and treatable. The Clinical Frailty Scale (CFS) he developed has become a cornerstone assessment tool in geriatric medicine and long-term care worldwide.

Prof. Rockwood noted that current healthcare systems often focus excessively on treating single diseases, neglecting the holistic needs of elderly patients with multiple comorbidities and functional decline. By applying the CFS, care teams can rapidly assess a senior’ s physiological reserve and care risks, shifting the focus from “disease treatment” toward “functional maintenance,” “disability prevention,” and “enhanced quality of life,” thereby reducing futile medical care and strengthening individualized decision-making.

II. Digitalization of Frailty Assessment and the Acute-to-Long-Term Care Transition

Dr. Tzu-Jung Fang, Director of the Department of Geriatric Medicine at KMUH, presented on "Frailty Assessment and Intervention- Digital Applications in Acute Care." She shared experiences in implementing digital tools within clinical practice. Systematic assessment workflows can effectively reduce evaluation time while providing real-time monitoring of physiological reserves and functional changes. Her presentation further elaborated on using assessment data to drive precision nutrition recommendations, early mobilization, and rehabilitation plans. These extend to post-discharge transition and follow-up care, providing a concrete practical framework for the Center' s future integrated model of "Acute Care—Long-term Care—Community Support."

III. Practical Exercise Prescriptions for Frail

Seniors Prof. I-Hua Chu from the Department of Sports Medicine utilized evidence-based science to explain that exercise interventions for frail seniors should go beyond simply- increasing activity levels and instead establish clear, safe, and therapeutic exercise prescriptions. She shared how to design multi-faceted training programs for seniors with muscle loss or impaired balance, helping reverse or delay frailty while managing risks related to joint degeneration and cardiovascular health. Furthermore, Professor also addressed common psychological and safety concerns, such as the fear of falling and the safety boundaries of high-intensity resistance training, providing high reference value for long-term care and rehabilitation professionals.`

IV. Integrated Frailty Intervention Strategies

Exercise and Nutrition Asst. Prof. Wen-Hsin Chang from the Department of Sports Medicine, drawing on her dual expertise in nutrition and sports medicine, emphasized that frailty interventions must simultaneously address "exercise stimulus" and "nutritional support." Her presentation focused on practical operations, from nutrient intake and timing to designing high-nutrient-density dietary strategies that accommodate common challenges such as chewing difficulties, loss of appetite, and chronic disease restrictions. By promoting the integrated concept of "exercise as muscle stimulus and nutrition as repair material," she provided actionable guidelines for care providers in long-term care facilities and home care settings to help seniors build more resilient physical functions.

This forum effectively facilitated interdisciplinary exchange among the fields of geriatrics, sports medicine, nutrition, and long-term care. It aligns closely with the World Health Organization' s (WHO) Integrated Care for Older People (ICOPE) framework, focusing on "Intrinsic Capacity"-oriented early identification of frailty, functional assessment, and interdisciplinary intervention strategies. This underscores a pivotal shift from disease-centric treatment toward functional maintenance and disability prevention. Furthermore, the practical experiences shared regarding frailty assessment, exercise/nutritional interventions, and acute-to-long-term care transitions echo the goals of Taiwan' s Long-Term Care 2.0 policy—emphasizing aging in place, disability prevention, and the integration of medical and long-term care services. These outcomes will serve as crucial policy and practical evidence for the CLTCR' s future initiatives in integrated geriatric care, professional training, and service model optimization.

Constructing New Models for Clinical Ethical Decision-Making and Emotional Resilience: From Mandatory ICU Ethics Consultation to the MaRIS Humanistic Education Framework

University-Level Mission-Oriented Research Center-Center for Medical Education and Humanizing Health Professional Education (MEHHPE)
Postdoc. Nina Tsai, Chuan-Hui Chuang / Director Ming-Ju Tsai

This quarter, the MEHHPE published two significant achievements in international journals. First, Dr. Yen-Ko Lin's research team confirmed that "Mandatory Clinical Ethics Consultation" (Mandatory CEC) effectively reduces medical resource utilization, mitigates conflicts between families and clinical teams, and enhances family satisfaction with end-of-life care. Second, Dr. Wen-Li Hou's research team applied the MaRIS Model (Mindfulness, Affective Reflection, Impactive Experience, Safe Space) to nursing education. Their study found that this approach significantly boosts students' psychological resilience, yielding even better results when implemented prior to clinical placement.

These outcomes highlight our integrated advancement in "Clinical Ethics," "Emotional Education," and "Humanistic Core Competencies," demonstrating our university's significant influence on medical education research in Southern Taiwan.

This quarterly report highlights two key studies from our center. The first involves an eight-year longitudinal study on "Mandatory Clinical Ethics Consultation" in Intensive Care Units (ICUs), proving its significant effectiveness in reducing non-beneficial medical treatment and lowering conflict rates. The second study explores how the "MaRIS Teaching Model" builds a psychological shield for nursing students, enhancing their resilience against clinical stress. Selected from the international journals *BMC Medical Ethics* and *Nurse Educator*, these works collectively demonstrate how we implement a more dignified and caring medical environment through scientific research.

Highlight I: An Eight-Year Study on "Mandatory Clinical Ethics Consultation" in ICUs (Lin et al., 2025, *BMC Medical Ethics*)

In the high-tension environment of the ICU, life-and-death decisions are often accompanied by immense ethical conflict. The research team analyzed 1,150 patients between 2013 and 2020 to investigate the pivotal role of "Mandatory Clinical Ethics Consultation (CEC)" in decisions regarding the withdrawal of life-sustaining treatment.

1 A Structured Ethical Intervention Process

Mandatory CEC is not a passive waiting process; rather, it is an active intervention for major medical decisions. Through the collaboration of a multidisciplinary team, it ensures that the patient's wishes and dignity are respected.

2 Empirical Effectiveness: Resource Optimization and Conflict Resolution

The data shows that CEC intervention has had significant positive impacts:

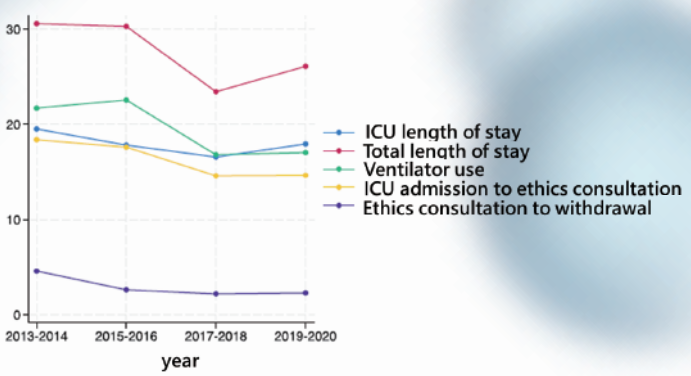
- Reduced Length of Stay and Ventilator Use: The earlier the ethical consultation intervenes, the more precisely treatment goals can be aligned, avoiding the prolongation of patient suffering through non-beneficial medical treatment.
- Significant Decline in Conflicts: Disagreements, particularly those "between families and the clinical team" and "within the medical team," showed a declining trend year by year.
- Cultural Differences by Specialty:

Comparison Item	Medical ICU (MICU)	Surgical ICU (SICU)
Resource Consumption	Higher (Longer length of stay and ventilator days)	Lower
Conflict Frequency	Relatively stable	Initially higher, but showed a significant decline in magnitude
Predictors	Advanced cancer, history of cardiac arrest	Surgical contractual relationship, clear clinical pathways

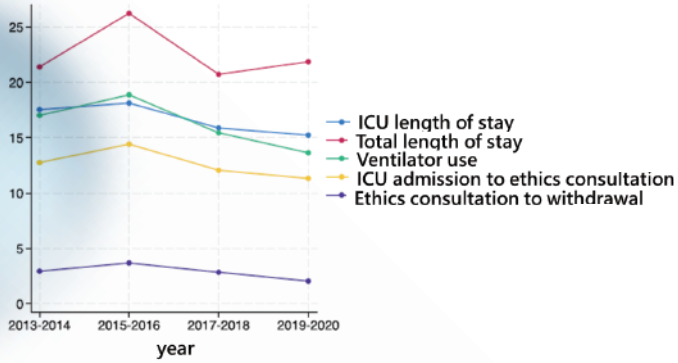
3 Family Satisfaction

Despite facing the loss of a loved one, family members gave the consultation team highly positive evaluations (average 4.5–4.8/5.0). Families felt that the structured communication provided them with companionship and care, rather than feeling forced to "give up".

Secular trends of outcomes for medical and surgical ICU



a. Secular trends of outcomes for medical ICU



b. Secular trends of outcomes for surgical ICU

Highlight II: The MaRIS Model—A Psychological Shield in Nursing Education (Hou et al., 2025, *Nurse Educator*)

Facing the challenge of nursing talent retention, the center introduced the MaRIS Pedagogical Model developed at Griffith University, Australia. By utilizing emotional awareness and reflection, the model strengthens the clinical readiness of nursing students.

1 The Four Core Elements of MaRIS

The MaRIS model is not just technical training, but a journey of emotional transformation:
- **Mindfulness**: Awareness of current emotions through breathing exercises.
- **Affective Reflection**: Transforming clinical shock into internal values through deep writing.
- **Impactive Experience**: Listening to real stories from senior mentors to establish emotional connections.
- **Supportive Space**: Creating a non-judgmental environment where students feel safe expressing vulnerability.

2 Timing is Key: Course First, Internship Later

The study conducted a quasi-experimental design with 65 nursing students. Results showed:
- Group A (Course before Internship): Showed a significant improvement in psychological resilience one month after the course.
- Group B (Internship before Course): Showed no significant improvement in resilience.
- Conclusion: Equipping students with psychological adaptive abilities before entering high-stress clinical environments can effectively prevent professional burnout during internships. As one student reflected:*"As the senior nurse shared their clinical experiences, we learned from impactful examples elicited through specific techniques. Group discussions, student feedback, and reflective writing prompted us to think about better coping strategies to empathize with patients and their families. I believe the preplacement course arrangement helped us become more aware of the variability in clinical settings and the means to manage these challenges, ultimately reducing our stress."*

These two studies collectively respond to two major challenges in contemporary medicine: "The Quality of Critical Care Ethical Decision-Making" and "The Sustainable Resilience of the Medical Workforce." Mandatory CEC bridges the gap between medical prognosis and family expectations, while the MaRIS model builds psychological capital for future healthcare professionals.

Moving forward, the center will continue to promote these two models, establishing a longitudinal line of humanistic education "from campus to clinic, and from bedside to society."

Policy Recommendations for *Helicobacter pylori* and Gastric Cancer Prevention

University-Level Mission-Oriented Research Center
Research Center for Medical Technology and Policy
Postdoc. Ching-Wei Chiu, Pei-Jing Yang/ Director Chi-Kung Ho

The Matsu Model: Transforming from a High-Risk Gastric Cancer Region to a Prevention Exemplar

Gastric cancer has long been a significant health threat in Taiwan, with Helicobacter pylori, classified by the World Health Organization as a Group 1 carcinogen, being the primary driver. While most infected individuals remain asymptomatic, the bacteria silently trigger chronic gastric inflammation, which can progress to cancer over time. Consequently, early screening and eradication are the critical keys to preventing gastric cancer.

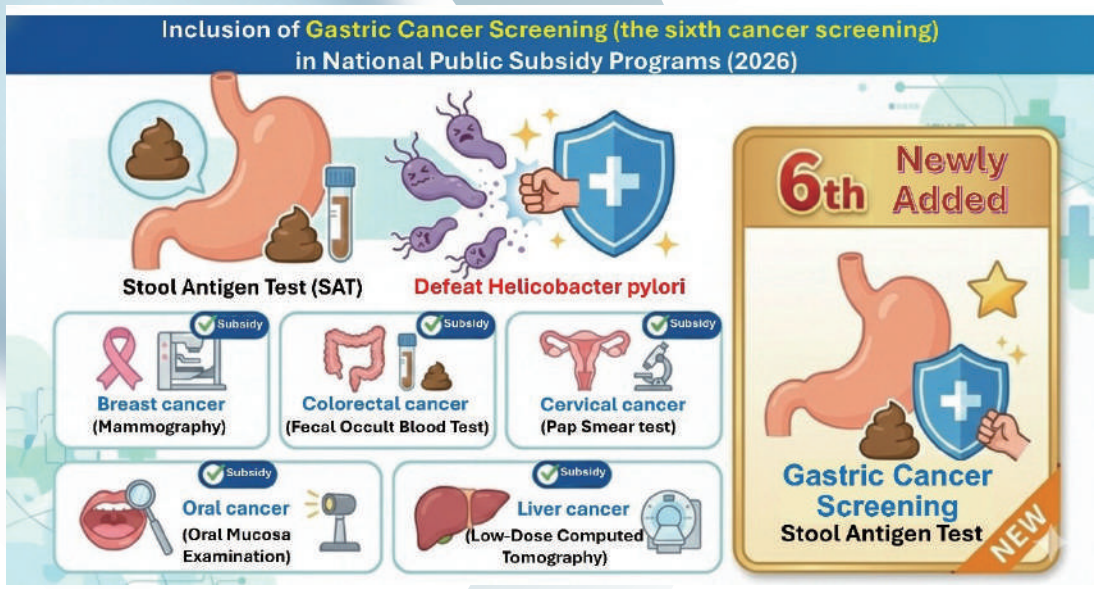
Taiwan initiated pioneering efforts in this field two decades ago. In 2004, Matsu became the first region in Taiwan to implement "Mass Helicobacter pylori Screening and Treatment." Among the 7,616 individuals participating in the study, 6,512 underwent screening, achieving a high coverage rate of 85.5%. Strikingly, the positive rate was as high as 70.39%, indicating that a significant portion of the population was at high risk for gastric cancer despite being asymptomatic.

Through long-term follow-up, Matsu has achieved results that have garnered significant global attention: between 2004 and 2016, the incidence of gastric cancer decreased by 53%. If this trend continues, a 68% reduction is expected by 2025. These findings have prompted the international medical community to reconsider the strategy, proving that proactive screening for Helicobacter pylori and administering treatment before symptoms appear can truly transform a region's trajectory regarding gastric cancer.

The Battle to Protect Your Stomach: Eradicating *H. pylori* for Gastric Cancer Prevention

Asia is a high-risk region for gastric cancer, necessitating its urgent integration into public health strategies to actively promote the screening and eradication of Helicobacter pylori to reduce the disease burden. Beginning in 2026, Taiwan will officially include gastric cancer screening in its government-funded programs, making it the "sixth major cancer screening" following breast cancer, colorectal cancer, cervical cancer, oral cancer, and liver cancer.

In the fight against gastric cancer, the most potent weapon is not treatment, but prevention at the source. A simple screening can significantly reduce the risk. Taiwan is authoring a new chapter in preventive medicine—a narrative that begins with all of us. Through the institutionalization of this screening policy, the objective is to detect Helicobacter pylori infections early and provide timely eradication therapy, thereby effectively intercepting the progression of gastric cancer and reducing both the incidence and mortality risk among the population.



Current Methods for Detecting *Helicobacter pylori*:

Testing Items	Methodology	Advantages	Cost (Reference Value)
^{13}C-Urea Breath Test (^{13}C-UBT)	The subject ingests urea labeled with carbon-13. If Helicobacter pylori is present in the stomach, its urease enzyme will hydrolyze the urea, producing carbon dioxide that is subsequently eliminated through exhalation. Infection is then determined by measuring the ratio of carbon-13 in the exhaled breath.	● Non-invasive and painless ● High diagnostic accuracy (approximately 95% or higher) ● Reflects current infection status ● Preferred method for post-eradication follow-up	Costs approximately NT$1,000–1,500 (self-paid).
Serum Antibody Test	The test involves drawing blood to detect the presence of specific IgG antibodies against Helicobacter pylori. The presence of these antibodies indicates that the individual has been infected with the bacteria either in the past or is currently infected.	● Simple procedure, only requires a blood draw ● Lowest cost among testing methods ● Cannot determine if eradication has been achieved; not recommended for follow-up.	Costs approximately NT$200–600 (self-paid).
Stool Antigen Test (SAT)	The Enzyme-Linked Immunosorbent Assay (ELISA) is utilized to detect the presence of Helicobacter pylori protein antigens in stool samples.	● Non-invasive, no blood draw required ● High accuracy, comparable to the breath test ● Particularly suitable for children or individuals unable to undergo the breath test ● Can be used for post-eradication follow-up	Costs approximately NT$600–1200 (self-paid). Starting in 2026, certain groups will be eligible for one free screening.
Gastric Biopsy (Endoscopic Biopsy)	Gastric mucosal tissue is obtained during endoscopy for rapid urease testing (RUT), histopathological examination, or bacterial culture.	● Gold standard for diagnosis ● Allows simultaneous assessment of ulcers, inflammation, or gastric cancer ● High diagnostic accuracy	Partial coverage under National Health Insurance (NHI) conditions; costs approximately NT$5,000 to 15,000 (depending on the medical institution).

Government-Funded Screening for *Helicobacter pylori*:

A New Era of Publicly Funded Gastric Cancer Prevention! The government has announced that starting in 2026, "Government-Funded Helicobacter pylori Screening" will be officially launched as Taiwan's sixth public cancer screening program. The government will subsidize a one-time lifetime "Stool Antigen Test for *H. pylori*" for citizens aged 45 to 74 (excluding those who participated in the 2024–2025 pilot programs). The core of this policy is "early detection and early eradication." However, the primary challenge in implementing a new public screening policy lies in increasing "screening willingness," as common barriers include fear, information asymmetry, and concerns regarding convenience.

Barriers to Public Participation in Screening:

- Lack of Information and Awareness: The public is unaware that gastric cancer screening has been covered by public funds since 2026, and is unclear about eligibility criteria or where to access the services.
- Misconceptions about Asymptomatic Infections: *H. pylori* infections often present no obvious symptoms. This leads to the misconception that "no pain means no disease," resulting in a lack of urgency for testing.
- Perceived Inconvenience and Time Constraints: Working professionals and elderly residents in rural areas often worry about long queues, complex procedures, or the need to take time off work, leading to behavioral procrastination.
- Misunderstanding of Screening Methods: The term "gastric examination" often triggers associations with painful "endoscopies," causing psychological resistance and avoidance.
- Fear of "screening for infection": Worrying about expensive treatment costs or inconvenience once diagnosed.
- Concerns Over Treatment Side Effects: There is a common belief that eradication therapy requires excessive antibiotics, raising concerns about potential side effects or damage to the intestinal microbiome.

Policy Optimization Strategies: Enhancing Public Participation

- Empowering Slogans: Highlighting Convenience and Tangible Benefits
  Optimization Focus:
  Emphasize "Pickup at Contracted Institutions" and "Full Subsidy for Testing."
  Implementation Strategy:
  The core slogan features "Zero Burden for Stomach Protection; Just One Small Sample." Clearly inform the public that this is not only a free service but also eliminates the need for endoscopy appointments or taking leave for breath tests at hospitals. Citizens can collect samples at home and return them to nearby contracted hospitals or clinics, significantly reducing psychological and time burdens.
- Integrated Model: Dual Protection for Colorectal and Gastric Cancer
  Optimization Focus:
  Leveraging the established foundation of the national colorectal cancer screening program to achieve a "1+1 > 2" synergy.
  Implementation Strategy:
  Since colorectal cancer screening is well-established and utilizes stool sampling, the government can promote a "Dual-Test Single-Sample" or "Simultaneous Collection" model. When citizens collect their colorectal cancer screening kits, they are simultaneously provided with the *H. pylori* screening set. This allows individuals to complete two critical cancer screenings through a single stool collection process, creating high administrative efficiency and maximizing screening motivation.

- Establishing a "Fast-Track Referral and Consultation" Path for Positive Test Results
  Optimization Focus:
  Eliminating the "information gap" where patients are uncertain about where to seek medical care following a positive test result.
  Implementation Strategy:
  Establish a standardized referral mechanism for positive cases. When citizens receive a positive *H. pylori* stool antigen notification, a list of nearby gastroenterology clinics capable of providing eradication therapy should be attached to the notification (via letter or SMS). Additionally, a consultation hotline should be provided to offer detailed explanations regarding the safety of the treatment course, effectively alleviating public concerns about the long-term use of antibiotics.
- Promoting the "Family Collective Defense" Health Concept
  Optimization Focus:
  Including clear health education manuals within the "Screening Kits" to advocate for "Oral-Fecal Transmission Awareness" and the use of separate chopsticks and spoons to reduce reinfection rates.
  Implementation Strategy:
  Since Helicobacter pylori is primarily transmitted through the oral-fecal route, screening policies should integrate lifestyle education. This includes reminding citizens to avoid sharing utensils with infected family members. By promoting good hygiene habits such as "using serving spoons and chopsticks" and "avoiding shared cups or meals," the act of screening is transformed into a collective action to protect the entire family's health.

Comprehensive Screening + Early Eradication = Cancer Prevention

To ensure that "Gastric Cancer Screening" is not merely a policy launch but a deeply rooted and long-term effective initiative, simultaneous progress in clinical practice, institutional frameworks, and infection monitoring is required. The following four measures can maximize the overall prevention benefits. They not only effectively block the path of gastric cancer development at its source but also establish a sustainable and precise protection mechanism within the public health system. By reducing public health risks and laying a solid foundation for the long-term planning of national healthcare resources, these measures form a complete protective chain from "Early Detection → Immediate Treatment → Long-term Follow-up," leading to a continuous decline in the incidence of gastric cancer.

● Early Identification of Malignant Risks:

Screening not only enables the precise detection of bacteria but also facilitates the early identification of precancerous indicators, such as gastric mucosal atrophy and intestinal metaplasia. This allows high-risk populations to receive early intervention and treatment, effectively eliminating the threat of cancer in its nascent stages.

● Significant Reduction in Economic Burden:

By effectively blocking the progression of the disease through early screening, the high medical costs associated with advanced-stage cancer—such as expensive medications, chemotherapy, hospitalization, and surgery—can be avoided. This significantly reduces the healthcare expenditures for individuals, families, and the national health insurance system.

● Enhancing Treatment Success Rates and Healthcare Quality:

By strengthening the professional training of frontline healthcare personnel, communication efficiency between doctors and patients can be significantly improved. This enhances treatment adherence and medication accuracy among patients (particularly asymptomatic carriers), ensuring that every individual screened achieves the highest quality of eradication outcomes.

● Safeguarding National Medication Safety and Efficacy:

The establishment of a long-term antimicrobial resistance monitoring, and tracking system is essential to support research on local bacterial strains and to master their specific characteristics. This enables the formulation of treatment recommendations tailored specifically for the Taiwanese population. While promoting large-scale prevention initiatives, such measures effectively prevent the development of bacterial resistance, ensuring both the safety and sustainability of public health prevention policies.

Enhancing Health Literacy and Muscular Fitness among Urban Indigenous Peoples through Culturally Sensitive Care

University-Level Mission-Oriented Research Center
Indigenous Health Care and Cultural Sustainability Research Center
Director Chia-Yen Dai

Centered on culturally sensitive care, this program was conducted on November 18 and 25, 2025, at the Xiaogang Naluwan Cultural and Health Station. Dr. Jong-Rung Tsai from the Center provided explanations of health-related knowledge to help urban Indigenous community members better understand their physical conditions. The program introduced the causes, risks, and prevention of sarcopenia, combined with simple muscle strength assessments and practical recommendations, with the aim of enhancing health literacy and awareness of muscular fitness, and promoting healthy aging.

To address the practical needs of urban Indigenous communities in health care and aging-related issues, the Indigenous Health Care and Cultural Sustainability Research Center at KMU adopted culturally sensitive care as its core guiding principle and held a series of healthy living lectures on November 18 and 25, 2025, at the Naluwan Cultural and Health Station in Xiaogang District, Kaohsiung City. Through a community-based approach, the program promoted health education and preventive care initiatives.

The lectures were delivered by deputy director, Dr. Jong-Rung Tsai and focused on fundamental knowledge of sarcopenia, its causes, and its impact on daily functional abilities (Figure 1). The sessions helped community members understand the risk of age-related muscle loss. Using everyday language, the lectures explained the relationships among muscle strength, mobility, fall risk, and independent living, thereby lowering barriers to understanding medical knowledge and enhancing community engagement with health issues.

Simple muscle strength assessments were also conducted during the program (Figure 2) to help participants gain an initial understanding of their own physical condition. Practical recommendations regarding diet, exercise, and daily activity adjustments were provided, encouraging participants to incorporate health maintenance concepts into their everyday lives. Through hands-on practice and interactive explanations, the program strengthened health literacy and enhanced self-care capacity.

Held at the Naluwan Cultural and Health Station, a familiar community setting for Indigenous peoples, the activities took into account cultural backgrounds and social environments, fostering a safe and supportive learning atmosphere. Health education thus extended beyond knowledge transmission to become a process of community interaction and mutual support, embodying the principles of culturally sensitive care.

Looking ahead, the Center will continue to deepen its collaboration with communities by integrating medical expertise with cultural understanding. Through the development of health promotion initiatives that align with Indigenous life contexts, the Center aims to advance healthy aging among urban Indigenous peoples while pursuing the parallel goals of health care improvement and cultural sustainability.

Basic Understanding of Sarcopenia

Simple Muscle Strength Assessment

Other Important Highlights

- On November 20, 2025, a mental health promotion lecture was held at Namaxia Junior High School, with Dr. Po-Ying Huang serving as the lecturer.
- On November 27, 2025, a lecture on the prevention of the “three highs” (hypertension,hyperglycemia, and hyperlipidemia) and health management was conducted at the Laflan Cultural and Health Station in Taoyuan District, delivered by Health Educator Ya-Wen Song.

Mental Health Promotion Lecture Held at Namaxia Junior High School

Lecture on the Prevention of the “Three Highs” and Health Management

Regenerative Medicine and Cell Therapy Research Center

Musculoskeletal and Joint Tissue Sectioning Platform

Paraffin sectioning, hematoxylin-eosin (H&E) staining, and immunostaining are widely used techniques in routine histological specimen preparation. Paraffin sections allow for the observation of the morphological structure of human or animal cells and tissues, making them a primary method for studying, examining, and identifying cellular and tissue changes in fundamental medical research, clinical medicine, pathology, and forensic science. Additionally, they are extensively utilized in various other academic fields for research and teaching purposes. Most histological specimens observed under a conventional light microscope are prepared using paraffin sectioning techniques. Living cells or tissues are generally colorless and transparent, with little contrast between different tissue types or intracellular structures, making it difficult to distinguish them clearly under a standard optical microscope. Moreover, once tissues are removed from the living organism, they rapidly degenerate and decompose, losing their original structure. Therefore, tissues must undergo fixation, paraffin embedding, sectioning, and staining to preserve their morphology and prevent cellular degradation. Hematoxylin-eosin (H&E) staining and immunostaining are commonly used techniques for observing tissue morphology and identifying the localization of specific protein expressions within tissues.

Our center's Musculoskeletal and Joint Tissue Sectioning Platform provides technical services related to routine histological specimen preparation, including: 1. Dehydration and specimen embedding, 2. Paraffin sectioning, 3. Hematoxylin-eosin (H&E) staining, 4. Safranin-O staining, 5. Immunofluorescence staining. Our center is equipped with the necessary instruments for routine histological specimen preparation, including: a tissue processor, embedding machine, cooling plate, microtomes (manual/automatic), slide dryer, water bath, ovens (37°C/60°C), freezer (-20°C), staining jars for H&E staining, optical microscopes with imaging systems, and an automated tissue scanning and analysis system.

Services and Charges

The revised version will take effect from Jan. 2026

Services	Pricing
Paraffin Tissue Sectioning	
Dehydration and specimen embedding	■ Employee：NT$ 200 /Each tissue ■ Non-employee：NT$ 300 /Each tissue
Paraffin Sectioning	■ Employee：NT$ 80 /Each slide ■ Non-employee：NT$ 120 /Each slide
H&E staining	■ Employee：NT$ 100 /Each slide ■ Non-employee：NT$ 150 /Each slide
Safranin-O staining	■ Employee：NT$ 160 /Each slide ■ Non-employee：NT$ 200 /Each slide
Masson staining	■ Employee：NT$ 1,000 /Each slide ■ Non-employee：NT$ 1,500 /Each slide
Immunostaining	
Self-Provided Antibody	■ Employee：NT$ 2,000 /Each slide ■ Non-employee：NT$ 3,000 /Each slide
Antibody testing (1 antibody only)	■ Employee：NT$ 2,000 /Each slide ■ Non-employee：NT$ 3,000 /Each slide
Immunofluorescence staining	■ Employee：NT$ 2,000 /Each slide ■ Non-employee：NT$ 3,000 /Each slide

- If applicants provide their own antibodies for immunostaining, especially self-produced antibodies, they must bear the risk of staining abnormalities due to antibody instability.
- The antibody testing service is solely for evaluating the conditions of a single antibody on a specific tissue. Applicants must provide their own antibodies along with the corresponding antibody datasheet.
- A set of 12 slides typically requires approximately 14 working days for completion. If the number of slides increases, the completion time will be assessed separately.
- If research papers utilizing this platform' s services acknowledge our analysis platform in the"Acknowledgement"section, the center will offer incentives. Please refer to the incentive policy and acknowledgement guidelines for details.

Contact

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2026 IBMS-KMU Joint Symposium on Recent Advances in Biomedical Sciences

March 4, 2026 (Wed.) 08:50 – 17:40
March 5, 2026 (Thurs.) 09:00 – 12:15

Hall B, International Convention Center
(International Academic Research Building B2F)

Speaker

Keynote Speaker

- Academician Hui-Kuan Lin /Endowed Chair Professor, Department of Pathology, School of Medicine, Duke University, USA
- Dr. Fabrizio d'Adda di Fagagna /IFOM, Italy
- Dr. Feyruz Rassool /School of Medicine, University of Maryland, USA
- Dr. Andrea Alimonti /Institute of Oncology Research, Università della Svizzera italiana (USI), Switzerland
- (IBMS) Distinguished Research Fellow: Dr. Woan-Yuh Tarn, Dr. Sheau-Yann Shieh, Dr. Steve R. Roffler;
  Research Fellow: Dr. Hsiu-Ming Shih, Dr, Wen-Chang Lin; Associate Research Fellow: Dr. Shih-Yu Chen, Dr. Hsing-Chen Tsai;
  Assistant Research Fellow: Dr. Shu-Ping Wang, Dr. Chia-Wei Li, Dr. Yu-Ru Lee; Joint Appointment Research Fellow: Dr. Jun Suzuki
- (KMU) Assoc. Prof. Hui-Ching Wang, Prof. Hsin-Chih Yeh, Prof. Chuan-Feng Huang

Abstract

The symposium will focus on frontier topics in cancer biology, genomics, precision medicine, and translational medicine, and will be held in conjunction with the annual IBMS PI Retreat. More than 50 outstanding researchers from IBMS will gather at KMU, making this a rare event in both scale and stature. This important annual event provides a valuable opportunity for faculty members, researchers, and students to engage in close academic exchange and to establish or strengthen collaborative networks.

The symposium will feature several internationally renowned Keynote Speakers, including Academician Hui-Kuan Lin, Dr. Fabrizio d' Adda di Fagagna, a leading authority in DNA damage response, Dr. Feyruz Rassool, an expert in cancer and translational medicine, and Dr. Andrea Alimonti, a leading scholar in prostate cancer and precision medicine, who will share their latest research findings and global trends. The program will include multiple thematic lectures and dedicated poster sessions to promote interdisciplinary and inter-institutional research exchange and collaboration, further expanding the international perspective and impact of biomedical research in Taiwan.

Organizer: Office of Research & Development, Kaohsiung Medical University (KMU);
Institute of Biomedical Sciences (IBMS), Academia Sinica

2026 中研院生醫所-高雄醫學大學 聯合生物醫學新知研討會

IBMS-KMU Joint Symposium on Recent Advances in Biomedical Sciences

地點 Venue：高雄醫學大學國際會議中心B廳 (國際學術研究大樓B2F)
Hall B, International Convention Center (IR-B2F, KMU)

報名 Registration

115/3/4 (星期三) Mar. 4, 2026 (Wed.)

Time	Speaker	Title
08:30-09:00	Registration 報到	
Moderator: Dr. Woan-Yuh Tarn (譚婉玉), IBMS		
08:50-09:05	Opening Remarks & Group Photo	Dr. Yijuang Chern (陳儀莊) - Director, IBMS, AS Dr. Chien-Zie Chen (陳建志) - Chairman, Board of Trustees, KMU Dr. Ming-Lung Yu (余明隆) - President, KMU
09:05-09:50	Dr. Hui-Kuan Lin (林慧觀)	*Advancing PROTACs Technology for Targeted Cancer Therapy*
09:50-10:35	Dr. Fabrizio d'Adda di Fagagna	*The contribution of telomere biology to aging and cancer*
10:35-10:50	Coffee Break	
Moderator: Dr. Wen-Chang Lin (林文昌), IBMS		
10:50-11:15	Dr. Woan-Yuh Tarn (譚婉玉)	*lncRNA ribonucleoproteins contribute to DNA damage repair and 3D genome organization*
11:15-11:40	Dr. Sheau-Yann Shieh (謝小燕)	*Role of BTG3 in Epidermal Health and Disease*
11:40-12:05	Dr. Hui-Ching Wang (王慧晶)	*Why Do Some HNSCC Patients Relapse?-Molecular Insights into Treatment Resistance*
12:05-12:30	Dr. Hsiu-Ming Shih (施修明)	*Translating the SUMO code: From Molecular Discovery to Targeted Cancer Therapy*
12:30-13:30	Lunch	
Moderator: Dr. Wen-Wei Lin (林文瑋), KMU		
13:30-13:55	Dr. Shu-Ping Wang (王書品)	*An AML-specific transcriptional complex couples super-enhancers to mitochondrial oncogene programs*
13:55-14:20	Dr. Steve R. Roffler (羅傳倫)	*Glycosidic Switch Liposomes*
14:20-14:45	Dr. Shih-Yu Chen (陳世淯)	*Unraveling immune dynamics with multi-omic single-cell technologies*
14:45-15:10	Dr. Chia-Wei Li (李家偉)	*scRepertoire-seq and Deep learning improve PD-L1 CAR-T specificity in solid tumor treatment*
15:10-16:20	Poster Session & Coffee Break	
Moderator: Dr. Wen-Wei Lin (林文瑋), KMU		
16:25-16:50	Dr. Hsin-Chih Yeh (葉信志)	*Advancing Precision Oncology in Upper Tract Urothelial Carcinoma: From Clinical Big Data to AI-Powered Multi-Omics*
16:50-17:15	Dr. Yu-Ru Lee (李育儒)	*Long Non-coding RNA Control of Protein Stability in Cancer and Anti-Tumor Immunity*
17:15-17:40	Dr. Hsing-Chen Tsai (蔡幸真)	*Epigenetic modulation of the cancer–immune interface for effective cancer immunotherapy*
18:00-	Dinner Banquet (Mainly for Invited Guests)	

115/3/5 (星期四) Mar. 5, 2026 (Thurs.)

Time	Speaker	Title
08:30-09:00	Registration 報到	
Moderator: Dr. Sheau-Yann Shieh (謝小燕), IBMS		
09:00-09:45	Dr. Feyruz Rassool	*ZNFX1: A master regulator in epigenetically-induced pathogen mimicry, mitochondrial dysfunction and STING-dependent signaling in cancer*
09:45-10:30	Dr. Andrea Alimonti	*PARP supports intratumor immature neutrophil expansion in cancer*
10:30-10:50	Coffee Break	
Moderator: Dr. Wen-Wei Lin (林文瑋), KMU		
10:50-11:15	Dr. Tsuan-Feng Huang (黃釧峰)	*Unmet clinical needs in the post-DAA era: the risk and molecular mechanisms of hepatocellular carcinoma after HCV eradication*
11:15-11:40	Dr. Wen-Chang Lin (林文昌)	*Discovery of Pan-cancer Biomarkers by Anchor-Biomarker Gene pairs (ABGC)*
11:40-12:05	Dr. Jun Suzuki (鈴木淳)	*Emergence and Clearance of Unwanted Cells: Mechanistic Insights into Cellular Senescence*
12:05-12:15	Closing Remarks	Dr. Yijuang Chern (陳儀莊) - Director, IBMS, AS Dr. Ming-Lung Yu (余明隆) - President, KMU

Organizers:
Institute of Biomedical Sciences, Academia Sinica (IBMS)
中央研究院 生物醫學科學研究所
Kaohsiung Medical University (KMU)
高雄醫學大學

大會手冊 Program

2026 Taiwan Regenerative Medicine Summit

Mar. 13, 2026 (Fri.) 9:00～17:00

Performance Hall, First Teaching Building, KMU

Speaker

- Prof. Kenji Osafune, Deputy Director, Center for iPS Cell Research and Application (CiRA), Kyoto University
- Prof. Gun-Il Im, Department of Orthopaedics and Director of Integrative Research Institute for Regenerative Biomedical Engineering, Dongguk University, Goyang, Korea.
- Prof. Cheng-Chang Lu, Department of Orthopedics; Deputy CEO, RCC; Director, Department of Orthopaedic KMSH.
- Prof. Yen-Wen Liu, Institute of Pharmacology / Department of Cardiology, Department of Internal Medicine, College of Medicine, National Cheng Kung University
- Assoc. Prof. Akitsu Hotta, Center for iPS Cell Research and Application (CiRA), Kyoto University
- Assoc. Prof. Hidetoshi Sakurai, Center for iPS Cell Research and Application (CiRA), Kyoto University
- Junior Asst. Prof. Shin-ichi Mae, Center for iPS Cell Research and Application (CiRA)

Abstract

The 2026 Taiwan Regenerative Medicine Summit will be grandly held on March 13, 2026, at the International Conference Center of KMU. Organized by the RCC, this international summit brings together distinguished scholars from Kyoto University (Japan), Dongguk University (Goyang, Korea), and leading Taiwanese research institutions

The event will focus on cutting-edge advances in stem cell therapy, gene editing, and tissue engineering, fostering international collaboration to accelerate technological breakthroughs and the translation of regenerative medicine into clinical applications.

We sincerely invite you to join us in this inspiring event!

Organizer: Regenerative Medicine and Cell Therapy Research Center (RCC)
Co-Organizer: Orthopedic Research Center College of Medicine; Department of Medical Research, Far Eastern Memorial Hospital; Department of Orthopaedics, KMUH; KMGH; KMU Orthopedic Alumni Association; Kaohsiung City Medical Affairs and Healthcare Administration Association

QUARTERLY IMPORTANT EVENTS

QUARTERLY IMPORTANT EVENTS

【KMU AI seminar】
Applications of VLM in the Medical Field

Oct. 7, 2025 (Tue.) 12:10~13:20 IR630, 6F, International Academic Research Building

Speaker

● **Manager Yu-Hao Liu** (Linker Vision)

Abstract

With over a decade of clinical and international sports medicine experience, he specializes in the management of sports injuries, rehabilitation planning, and interdisciplinary team collaboration. He later transitioned into the field of medical artificial intelligence, where he is responsible for business development and clinical integration, driving forward-looking solutions in medical imaging and predictive health management. He excels at translating clinical needs into actionable technical strategies and at building bridges among technical teams, clinicians, and industry partners.

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

The 5th International Conference on Athletes Care and Performance (ICACP) 2025

Oct. 10, 2025 (Sat.) ~ Oct., 11, 2025 (Sun.)

Hall B, International Convention Center
(International Academic Research Building B2F)

Abstract

The scope of the 2025 conference covers a wide range of athlete-related injury topics, including sports medicine, sports injury management, athletic training, and sports performance. The conference also addresses strategies for “athlete care and return to play,” with a particular focus on exploring talent development models and training pathways for sports injury prevention professionals across different countries. These themes represent the core academic and practical issues of this conference.

Interactive Q&A Session with Deputy CEO Nai-Jen Chang.

Professor Chia-Liang Tsai interacts with authors during the review discussion session.

Keynote Lecture by Director Kai-Wei Lee, Centre for Heat Resilience and Performance, National University of Singapore.

Group Photo of Symposium Speakers and Moderators

Organizer: Physical Education Center
Co-Organizer: Precision Sports Medicine and Health Promotion Center (PSMHPC), Department of Sports Medicine

QUARTERLY IMPORTANT EVENTS

KMU International Conference on BioMedicine (ICOBM 2025)

Sports Medicine: Application of Precision Sports Medicine & Doping

Oct. 10, 2025 (Fri.) 16:10～18:00

IR201, 2F, International Academic Research Building

Speaker & Speech Title

- **Director Lee Kai Wei** (Heat Resilience &Performance Centre, NUS)
  Heat stress and human performance distress and eustress
- **Assoc. Prof. Chih-Wei Chang** (School of Pharmacy, Kaohsiung Medical University)
  Next-Generation Anti-Doping: Microsampling Technologies

Abstract

The ICOBM 2025 focuses on the latest advancements in biomedical technology, precision medicine, and interdisciplinary health promotion. The conference brings together researchers, clinicians, engineering and technical teams, and industry experts from around the world to explore emerging trends and clinical applications in biomedical research.

The program covers a broad range of topics, including sports medicine, rehabilitation engineering, AI-based health risk prediction, chronic disease management, community care models, and emerging biomedical technologies. Through keynote lectures, paper presentations, and international exchange platforms, the conference aims to promote knowledge sharing and interdisciplinary collaboration.

This conference seeks to advance the integration of biomedical research and practice, accelerate the translation of innovative outcomes into clinical and community health services, and provide forward-looking and practical solutions to global health challenges.

Special Lecture by Assoc. Prof. Chih-Wei Chang.

Q & A Session

Special Lecture by Director Kai-Wei Lee, Heat Resilience &Performance Centre, NUS

Organizer: Office of Global Affairs
Co-Organizer: Precision Sports Medicine and Health Promotion Center (PSMHPC)

KMU International Conference on BioMedicine (ICOBM 2025)

Medical Policy (Telehealth, Aging, Long-Term Care): Telemedicine in medical care and long term care: capabilities, features, and applications

Oct. 10, 2025 (Fri.) 14:00～17:50

Multi-functional Meeting Room, B2F, International Academic Research Building

Speaker & Speech Title

- **Dr. Hidenori Arai** (President, National Center for Geriatrics and Gerontology, Japan)
  Innovation in Healthy Longevity Powered by AI
- **Dr. Chih-Cheng Hsu** (CEO, National Center for Geriatrics and Welfare Research, NHRI)
  Technology-Driven Solutions for Healthy Aging
- **Dr. Hung-Yi Chiou** (Director, Institute of Population Health Sciences, NHRI)
  From Healthcare to Long-term Care: Smart Transformation and the Role of Telemedicine in Sustainable Care
- **Dr. Yuan-Han Yang** (Director, Neuroscience Research Center)
  Applying Digital Medicine and Telehealth in Dementia Management

Abstract

In response to the global aging trend, this lecture focuses on Artificial Intelligence (AI) and technology-driven solutions, exploring the pivotal role of telemedicine in promoting healthy longevity, healthy aging, and the intelligent transformation of healthcare and long-term care. Characterized by its high degree of interdisciplinary and international collaboration, the event has invited several world-leading scholars to engage in in-depth exchanges regarding the applications of AI and telemedicine in specific fields, such as dementia management. By integrating cross-disciplinary innovations, this activity not only establishes a platform for substantive dialogue between domestic and international scholars but also features a dedicated Q&A session to stimulate forward-thinking, ultimately providing a strategic blueprint for the development of sustainable and efficient future care systems.

Group photo

Group photo of Minister Chung-Liang Shih, President Hidenori Arai, and President Bih-O Lee

Keynote Speech by President Hidenori Arai

Keynote Speech by CEO Chih-Cheng Hsu

Keynote Speech by Director Hung-Yi Chiou

Keynote Speech by Director Yuan-Han Yang

Group photo of President Hidenori Arai,
CEO Chih-Cheng Hsu, and President Bih-O Lee

Group photo of CEO Chih-Cheng Hsu,
Director Hung-Yi Chiou, and President Bih-O Lee

Group photo of Director Hung-Yi Chiou,
Director Yuan-Han Yang, and President Bih-O Lee

Organizer: Office of Global Affairs
Co-Organizer: Research Center for Medical Technology and Policy,
Center for Long-Term Care Research

Special Lecture

Multi-omics integrated analysis explores biomarkers for the efficacy of oral anti- coccidiosis vaccines.

Oct. 17, 2025 (Fri.) 12:00~13:00

3rd Meeting Room, 3F, Li-Hsieh Building

Speaker

● **Asst. Prof. Po-Yo Liu** (Department of Parasitology, Microbiology, and Immunology, NSYSU)

Abstract

Dr. Liu shared his research journey and achievements in the development of oral vaccines against coccidiosis.

Organizer: Teaching and Learning Development and Resource Center
Co-Organizer: Center for Tropical Medicine and Infectious Disease Research (TMED)

QUARTERLY IMPORTANT EVENTS

Special Lecture

Maximum likelihood estimation and control variates with Hashing Algorithms

Oct. 22, 2025 (Wed.) 12:10~13:20 IR630, 6F, International Academic Research Building

Speaker

● **Asst. Prof. Keegan Kang** (Assistant Professor, Department of Statistics, Bucknell University)

Abstract

The lecture will introduce the application of hashing algorithms in similarity estimation and explain how combining maximum likelihood estimation with control variates can enhance the efficiency and accuracy of data analysis and model inference. The speaker will discuss the theoretical connections and practical potential of these methods from both statistical and machine learning perspectives.

Organizer: Biomedical Artificial Intelligence Academy (BAIA)

Special Lecture

Current Status and Future Forecast of Dengue Fever Vector Mosquito Distribution in Taiwan

Oct. 23, 2025 (Thurs.) 12:10~13:20

3rd Meeting Room, 3F, Li-Hsieh Building

Speaker

● **PhD Ching-Chi Huang** (National Institute of Infectious Diseases and Vaccinology, NHRI)

Abstract

Dr. Huang shared his research journey and findings regarding the current distribution of dengue fever vectors in Taiwan.

Organizer: Teaching and Learning Development and Resource Center
Co-Organizer: Center for Tropical Medicine and Infectious Disease Research (TMED)

QUARTERLY IMPORTANT EVENTS

【KMU AI seminar】
Sharing Experiences from the Smart ICU

Oct. 30, 2025 (Thurs.) 12:10~13:20　　IR630, 6F, International Academic Research Building

Speaker

● **Attending Physician Chih-Hung Cheng** (Division of Pulmonary, KMUH)

Abstract

The lecture will share the design concepts of smart wards, the development of clinical decision dashboards, the application of artificial intelligence in critical care, and future development visions. It will introduce how connected devices and real-time data integration are used to achieve real-time patient information monitoring and clinical decision support. The team has developed an AI-assisted system for interpreting endotracheal tube positioning and a prognostic prediction model for critically ill patients, aiming to improve patient safety and care efficiency. In the future, efforts will continue toward AIoT integration, automated database construction, explainable AI, and electronic diagnostic decision-making, with the goal of creating a trustworthy and clinically valuable new model for smart critical care.

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

Special Lecture

Cross-Serotype Coverage and Long-Term Protection: A Design Framework for Dengue Subunit Vaccines

Oct. 30, 2025 (Thurs.) 12:10~13:30

3rd Meeting Room, 3F, Li-Hsieh Building

Speaker

● **Asst. Prof. Shu-Wen Wan** (Institute of Microbiology and Immunology, NCKU)

Abstract

Dr. Wan shared her research journey and achievements in the development of dengue vaccines.

Organizer: Teaching and Learning Development and Resource Center,
M. Sc. Program in Tropical Medicine of College of Medicine
Co-Organizer: Center for Tropical Medicine and Infectious Disease Research (TMED)

QUARTERLY IMPORTANT EVENTS

【KMU AI seminar】

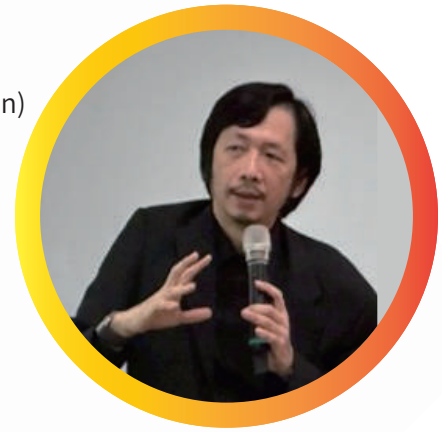
From Automation to Autonomous — How AI and Digital Twins Empower the Future of Industry

Nov. 5, 2025 (Wed.) 12:10~13:20

IR630, 6F, International Academic Research Building

Speaker

● **Deputy General Manager Andrew Hsiao** (AI Development Div., Pegatron)



Abstract

This talk explores the shift from automation to autonomy, enabling systems to learn, reason, and optimize themselves through AI and digital twins, reshaping research, operations, and innovation, and powering the next century with intelligence.

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

Academic Exchange Visit to Waseda University, Japan

Nov. 11 (Tue.) ~ Nov. 13 (Thurs.), 2025

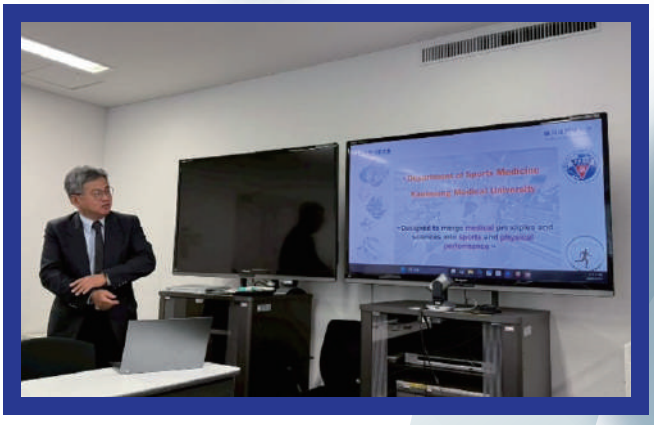
Waseda University, Japan

Abstract

Members of the PSMHPC conducted an international exchange and academic visit to the Department of Sport Sciences at Waseda University, a sister university in Japan. Waseda University has long conducted the WASEDA' s Health Study, a 20-year longitudinal study targeting alumni aged 40 years and older, systematically collecting data on physical fitness, lifestyle behaviors, and chronic diseases among middle-aged and older adults, with numerous findings published in international peer-reviewed journals.
This project aims to draw on Waseda University' s research outcomes and large-scale data collection and implementation models as important references for the development of exercise medicine and chronic disease prevention research at our center. In addition, discussions regarding a Memorandum of Understanding (MOU) for academic collaboration have been initiated with Prof. Miyashita, Vice Director of International Affairs of the Department of Sport Sciences.

Group Photo with the Faculty of Sport Sciences, Waseda University. (From left to right: Deputy Director Nai-Jen Chang, Professor Masashi Miyashita (Waseda), CEO Lan-Yuan Kuo, Director Shang-Jyh Hwang, Deputy CEO I-Hua Chu, Professor Norikazu Hirose (Waseda), Section Chief Hwai-Ting Lin, Section Chief Yung–Li Hung, Professor Hirotaka Matsuoka (Waseda))

Photo of Professor Nai-Jen Chang (left) and Associate Professor Yuri Hosokawa (right), Waseda University



Presentation by Section Chief Hwai-Ting Lin

Group Photo of the PSMHPC' s Members and the Faculty of Sport Sciences, Waseda University. (From left to right: Deputy CEO I-Hua Chu , Deputy Director Nai-Jen Chang, Section Chief Yung–Li Hung, Professor Masashi Miyashita (Waseda), Asst. Prof. Daichi Nishiumi (Waseda), Director Shang-Jyh Hwang, CEO Lan-Yuan Kuo, Section Chief Hwai-Ting Lin.

Organizer: Precision Sports Medicine and Health Promotion Center (PSMHPC)
Co-Organizer: Department of Sports Medicine

QUARTERLY IMPORTANT EVENTS

Sports Medicine Week

Nov. 10 (Mon.) ～ Nov. 14 (Fri.), 2025 lobby, 1F, International Academic Research Building

Abstract

This Sports Medicine Week integrates physical fitness training, AFASCAN exergaming experiences, sports injury prevention demonstrations, and taping techniques. Under professional guidance, participants learn proper exercise techniques and fundamental injury-prevention concepts. Through a relaxed and interactive approach, the event enhances public motivation for physical activity, promotes health enhancement and sports injury prevention knowledge, and strengthens the connection between sports medicine and the general public.

Sports Medicine Week

AFASCAN Exergaming Experience.

Assessment of joint range of motion and areas of muscle tightness.

Vice President Chou Experiences Taping

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

【KMU AI seminar】
Innovative Applications of AI and VR in Sports Training and Intelligence Analysis

Nov. 19, 2025 (Wed.) 12:10~13:20 IR630, 6F, International Academic Research Building

Speaker

● **Prof. Min-Chun Hu**
(Department of Computer Science, National Tsing Hua University)

Abstract

Tactical and skill training play a crucial role in athletic development. With the support of artificial intelligence (AI) technology, it is now possible to track the ball and players to detect fine-grained events, helping coaches collect detailed statistics and infer each team's tactics. Additionally, virtual reality (VR) technology can be leveraged to enhance both the effectiveness and experience of tactical and skill-based training. This talk will introduce modern systems that utilize AI and VR to help athletes conveniently gather valuable sports data and improve a wide range of skills.

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

QUARTERLY IMPORTANT EVENTS

【KMU AI seminar】
The Future Hospital – Applications and Practices of Medical Artificial Intelligence

Nov. 20, 2025 (Thurs.) 12:10~13:20 IR630, 6F, International Academic Research Building

Speaker

● **Director Chih-Chieh Yang** (Digital Medicine and Smart, NYCU)

Abstract

The application and practice of medical artificial intelligence will transform the future model of healthcare. Taiwan holds a globally leading position in both the semiconductor and healthcare sectors, yet it also faces challenges such as an aging society and increasing demand for medical resources. To address these challenges, we will introduce AI-assisted preventive medicine, as well as smart healthcare that integrates the Internet of Things (IoT), wearable devices, and telemedicine.

Specific application cases include non-contact atrial fibrillation detection, smart home sleep monitoring, and early warning systems for sepsis and cerebral hemorrhage using medical AI. These advancements can effectively enhance the accuracy and timeliness of clinical diagnosis. In addition, in the neuropsychiatric field, the use of AI to analyze brain images for assisting diagnosis and evaluating neurological and psychiatric disorders, along with the development of non-invasive deep brain stimulation therapies, will be key to understanding brain diseases and advancing precision medicine.

Finally, through digital therapeutics and mobile health applications, not only can patients' quality of life be improved, but overall medical services can also be optimized—ushering in a smarter and more personalized future of healthcare.

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

【KMU AI seminar】
Exploring Normalizing Flows and Their Diverse Applications

Nov. 24, 2025 (Mon.) 12:10~13:20 IR630, 6F, International Academic Research Building

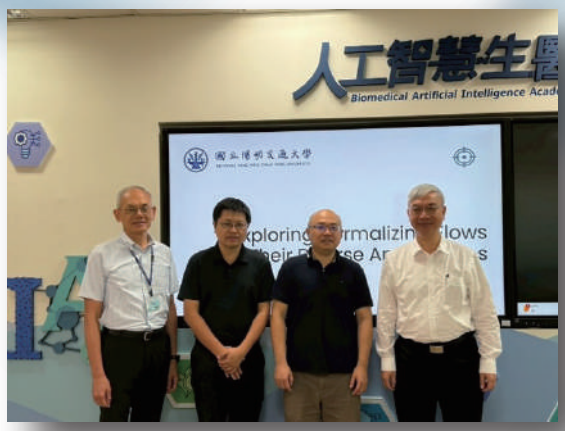
Speaker

● **Prof. Yu-Sheun Wang**
(Institute of Data Science and Engineering, NYCU)

Abstract

Normalizing Flows (NFs) can precisely map simple base distributions to complex real-world data while enabling accurate likelihood estimation—something that is often difficult for other models to achieve.

This talk will introduce the core concepts and advantages of NFs, and share our recent research on their practical applications in tasks such as graph coloring, badminton shuttle landing prediction, and classification with noisy labels. In addition, we will briefly highlight the potential and breakthroughs of NFs in biomedical fields, including medical image analysis and drug molecule design, demonstrating their innovative value across disciplines.



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

QUARTERLY IMPORTANT EVENTS

【KMU AI seminar】
Applications of Visual Analytics and Large Language Models in Data Analysis

Nov. 26, 2025 (Wed.) 12:10~13:20

IR630, 6F, International Academic Research Building

Speaker

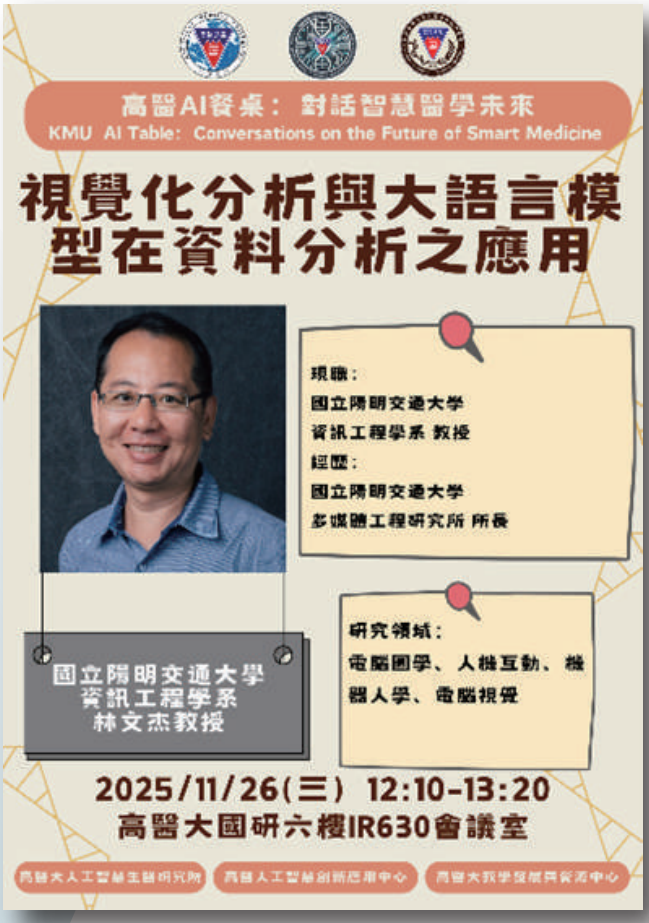
● **Prof. Wen-Chieh Lin**

(Department of Computer Science, NYCU)

Abstract

Facing increasingly large volumes of data, effectively organizing and understanding information has become a critical challenge. Visual analytics techniques transform complex data into graphical, interactive interfaces, enabling users to intuitively explore datasets and uncover hidden relationships. Natural language processing—particularly the recent advances brought by large language models—can analyze textual data and generate descriptive explanations, supporting interpretation and enriching the ways we communicate insights.

This talk introduces the use of visual analytics and natural language technologies in scenarios such as online learning, personalized data exploration, knowledge-graph navigation, autonomous-vehicle safety testing, and image editing. Through these examples, we demonstrate how visual analytics and large language models can help us perform data analysis and decision-making more flexibly and effectively.



Organizer: Biomedical Artificial Intelligence Academy (BAIA)

Co-Organizer: Medical AI Innovation and Application Center, KMUH; Teaching and Learning Development and Resource Center

Joint Symposium on Artificial Intelligence for Precision Healthcare between Stanford University and Kaohsiung Medical University

Dec. 2, 2025 (Tue.) 8:00~12:00

IR630, 6F, International Academic Research Building

Abstract

The event aims to examine how AI is reshaping precision medicine and the future of healthcare.

Joint Symposium on Artificial Intelligence for Precision Healthcare between Stanford University and Kaohsiung Medical University

Stanford MEDICINE School of Medicine

Center for Asian Health Research and Education

Date: December 1, 2025 (Monday), 16:00–20:00 (GMT-8)
/ December 2, 2025 (Tuesday), 08:00–12:00 (GMT+8)
Format: Hybrid (On-site & Online)
Presentation Format: KMU speakers — on-site; Stanford CARE speakers — online
Venue: Room IR630, 6F, International Academic Research Building
Organizers:
Stanford Center for Asian Health Research and Education (CARE)
Biomedical Artificial Intelligence Academy (BAIA), Kaohsiung Medical University (KMU)

Program Book

07:50 – 08:00 Registration

08:00 – 08:10 Welcome and Opening Remarks
Clinical Professor Bryant Lin (CARE) & Chairman Chien-Zie Chen (BAIA)

Session I: AI in Medicine
Moderator: Dean Henry Horng-Shing Lu (BAIA)
08:10 – 09:00 Speaker from CARE: Professor Jonathan H. Chen
Title: Integrated Intelligence or Illusory Imitations?
Speaker from BAIA: Professor Ming-Chung Chou
Title: Integration of clinical and CT radiomics models for predicting tumor recurrence in breast cancer patients following neoadjuvant therapy

Session II: AI in Learning Healthcare System
Moderator: Deputy Superintendent Kuang-I Cheng (BAIA)
09:00 – 09:50 Speaker from CARE: Professor Yong Chen
Title: PDA: Privacy-preserving Distributed Algorithms for Clinical Evidence Generation and Evidence Synthesis using Networked Data
Speaker from BAIA: Visiting Staff Tz-Ping Gau
Title: Workflow Agent in Medicine

09:50 – 10:10 ———— Tea Break ————

Session III: AI in biomedical discoveries and drug development
Moderator: Associate Professor Wen-Wei Lin (BAIA)
10:10 – 11:00 Speaker from CARE: Professor James Zou
Title: AI agents to automate biomedical discoveries
Speaker from BAIA: Professor Yeng-Tseng Wang
Title: Integrative Deep Learning and Molecular Simulation Strategy for Rational Discovery of Allosteric Inhibitors Targeting Zika NS2B-NS3

Session IV: Medical AI Education
Moderator: Professor Ming-Ju Tsai (BAIA)
11:00 – 11:50 Speaker from CARE: Professor Sharon F. Chen
Title: AI Clinical Coach: Fostering Critical Thinking Habits
Speaker from BAIA: Associate Professor Ke-Li Tsai
Title: Automatic Generation of Knowledge Graphs and Exam Questions from the Content of Physiology Textbooks Based on Deep Learning Model

11:50 – 12:00 Closing Remarks
Vice President Yeou-Lih Huang (BAIA)

Organizer: Biomedical Artificial Intelligence Academy (BAIA)

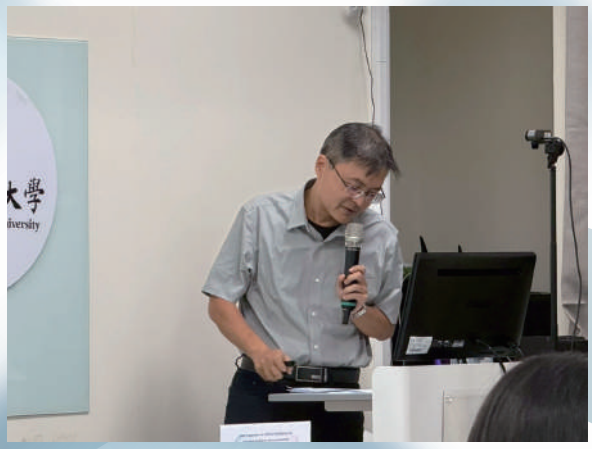
Group Photo

Opening Remarks by Chairman Chien-Zie Chen

Closing Remark by Vice President Yeou-Lih Huang

Speech by Prof. Ming-Chung Chou

One of Moderators Assoc. Prof. Wen-Wei Lin



Speech by Prof. Yeng-Tseng Wang

Speech by Assoc. Prof. Ke-Li Tsai

QUARTERLY IMPORTANT EVENTS

【KMU AI seminar】
Chinese Dimensional Sentiment Analysis Techniques and its Applications

Dec. 10, 2025 (Wed.) 12:10~13:20

IR630, 6F, International Academic Research Building

Speaker

● **Assoc. Prof. Lung-Hao Lee**
(Institute of Artificial Intelligence Innovation, NYCU)

Abstract

Dimensional sentiment analysis is a method that represents emotions using multiple continuous-valued dimensions. A common approach is to project the input text onto a Valence–Arousal (VA) 2D space through natural language processing techniques to indicate its underlying emotional content. Compared with traditional categorical sentiment analysis (positive/neutral/negative), dimensional sentiment analysis provides more fine-grained emotional information.

We will introduce how to construct Chinese dimensional sentiment analysis resources, develop AI deep-learning techniques to predict VA values, and apply this technology to intelligent psychological assessment to provide real-time emotional analysis information.

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

【BAIA × College of Medicine Seminar】
Frontiers of Data Science and AI: From Theory to Real-World Impact

Dec. 22, 2025 (Mon.) 09:00~16:20 IR630, 6F, International Academic Research Building

Abstract

This event specially invites leading international scholars and industry experts from Harvard Medical School, UC Davis, Cleanlab, and other institutions to share the latest advances at the forefront of data science and artificial intelligence. Spanning from theoretical breakthroughs to practical applications, the event offers a comprehensive interdisciplinary perspective.

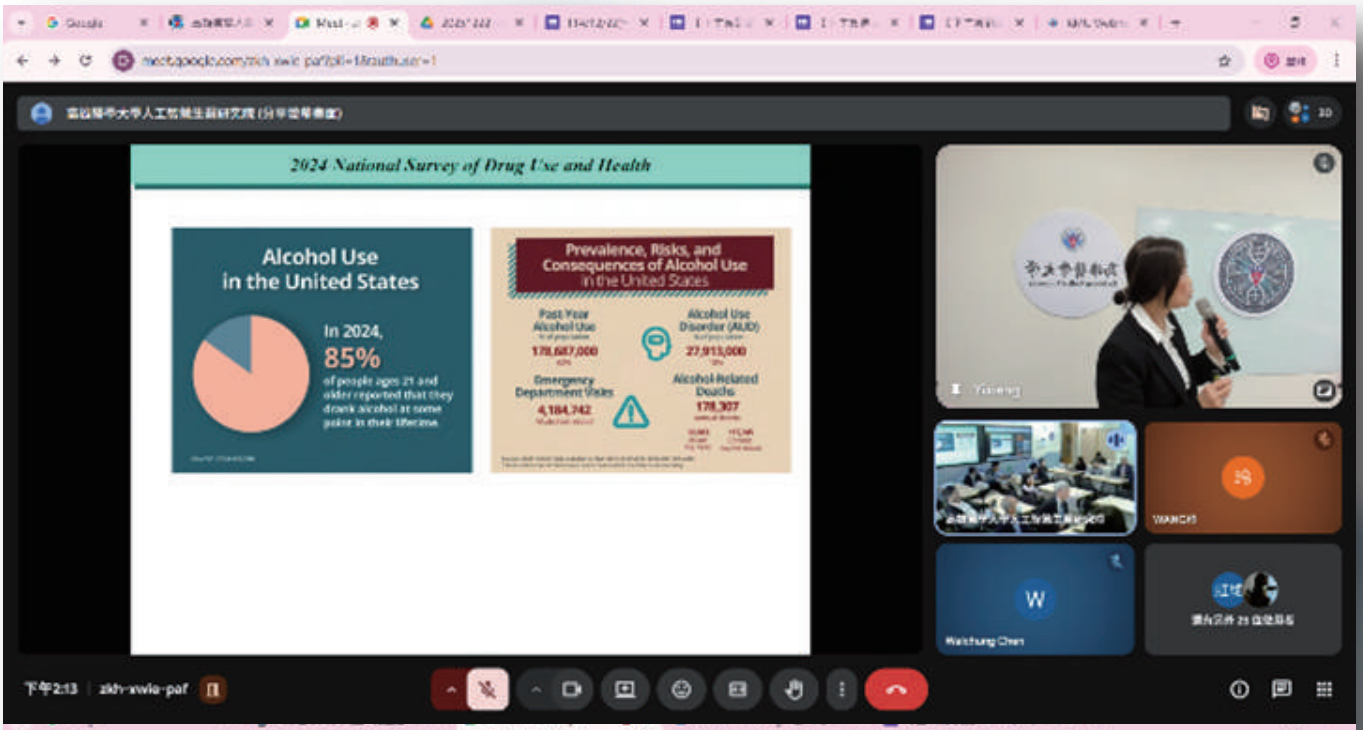
Time	Topic	Speaker	Moderator
09:00-09:05	Opening Remark	Ming-Lung Yu	
09:05-09:45	AI, Metaverse, and the Next Frontier of Thoracic Medicine	Chi-Fu Jeffrey Yang	Ming-Ju Tsai
09:50-10:30	Conformal Inference for Random Objects	Hans-Georg Mueller	Henry Horng-Shing Lu
10:35-11:15	Functional data analysis in the age of AI	Jane-Ling Wang	Ping-Hsun Wu
11:20-12:00	Quantifying Uncertainty in Answers from any Language Model and Enhancing their Trustworthiness	Jonas Mueller	Ming-Chung Chou
12:10-13:00	Reflections on Academic Career Development – A Personal Journey	Chi-Fu Jeffrey Yang	Wen-Chih Liu
13:20-14:00	Perturbation subsampling for the analysis of large-scale data	Zhezhen Jin	Ping-Hsun Wu
14:05-14:45	Bidirectional Relationships between Sleep Disturbances and Substance Use and Misuse	Maria Wong	Henry Horng-Shing Lu
14:50-15:30	Random Integrated Subdata Ensemble (RISE) for variable selection in big data with applications to develop a new epigenetic clock	Lih-Yuan Deng	Henry Horng-Shing Lu
15:35-16:15	Multimodal Approach to Understanding Diabetes Disease Progression	Hua Zhou	Henry Horng-Shing Lu
16:15-16:20	Closing Remark	Jaw-Yuan Wang	

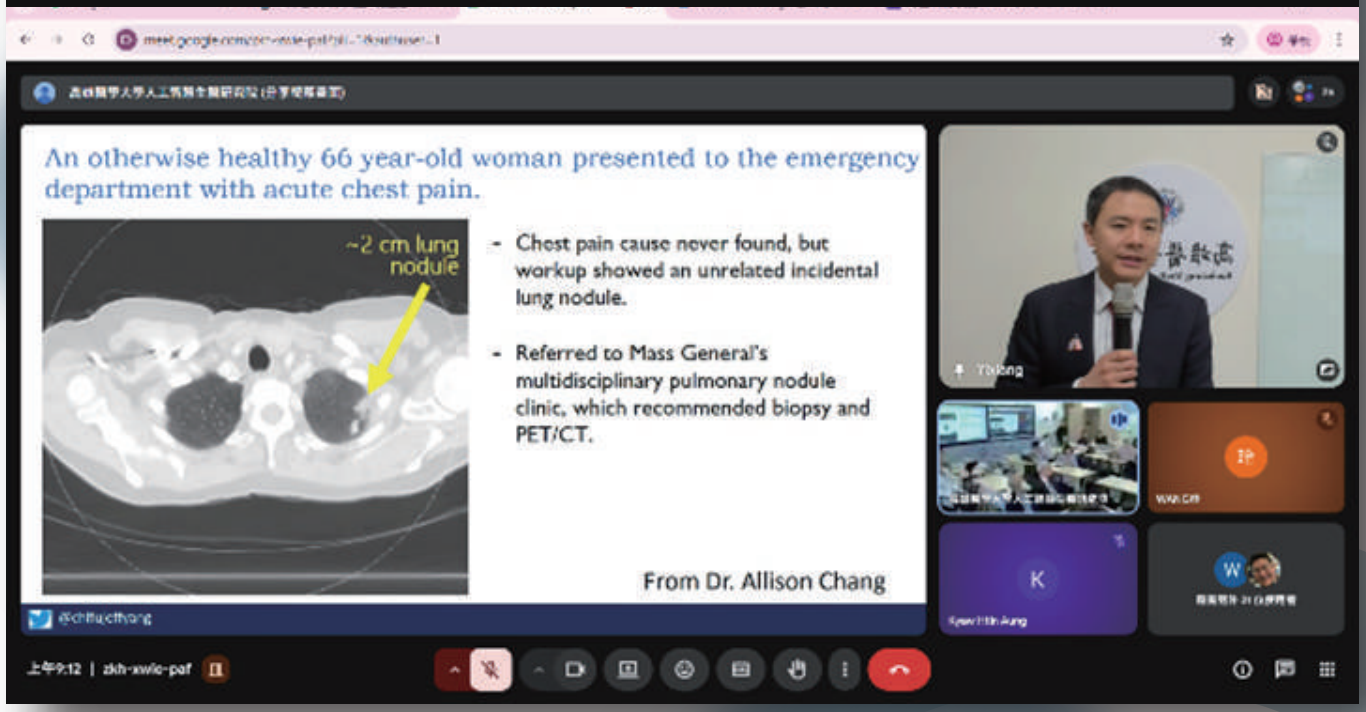
Organizer: Biomedical Artificial Intelligence Academy (BAIA), College of Medicine









2024 National Survey of Drug Use and Health
Alcohol Use in the United States
In 2024,
85%
of people ages 21 and older reported that they drank alcohol at some point in their lifetime.
Prevalence, Risks, and Consequences of Alcohol Use in the United States
Past Year Alcohol Use
178,687,000
Alcohol Use Disorder (AUD)
27,913,000
Emergency Department Visits
4,184,742
Alcohol-Related Deaths
178,307


An otherwise healthy 66 year-old woman presented to the emergency department with acute chest pain.
~2 cm lung nodule
- Chest pain cause never found, but workup showed an unrelated incidental lung nodule.
- Referred to Mass General's multidisciplinary pulmonary nodule clinic, which recommended biopsy and PET/CT.
From Dr. Allison Chang
@chiuchang

QUARTERLY IMPORTANT EVENTS

Special Lecture

Scalable Joint Modeling of Multiple Longitudinal Biomarkers and Competing Risks Time-to-Event Data: with Applications to Mega-Scale Health Research

Dec. 26, 2025 (Fri.) 12:10~13:20

IR630, 6F, International Academic Research Building

Speaker

● **Prof. Gang Li**

(Biostatistics and Computational Medicine, University of California, Los Angeles)

Abstract

This lecture will introduce a fast and efficient approach for semiparametric multivariate joint modeling, designed to overcome the computational challenges commonly encountered when analyzing large-scale biobank datasets. The method enables accurate simultaneous analysis of multiple longitudinal biomarkers and competing risk events, and its practical performance will be demonstrated using UK Biobank data. Participants may apply this modeling framework in their own research through the accompanying R package, FastJM

Organizer: Biomedical Artificial Intelligence Academy (BAIA)

KMU
Kaohsiung Medical University

RESEARCH CENTER QUARTERLY REPORT

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