

CMU GLOBAL CONNECTION

Edited by the Office of Global Affairs

cmucia@mail.cmu.edu.tw

yangly@cmu.edu.tw

Summer 2023

*China Medical University, Taiwan
Newsletter Issue #9*

China Medical University's Outstanding Performance in World University Rankings: Five Fields Ranked No.1 in Taiwan

Becoming a world-class university has always been the goal of China Medical University, Taiwan. In recent years, CMU has achieved outstanding performance in different world university rankings as well as various subject rankings, demonstrating that CMU has great strengths in academic and research performance.

In the "2022 Academic Ranking of World Universities (ARWU)", CMU is ranked No. 229 overall (2nd in Taiwan, 1st among private universities). In the "World University Rankings 2023 by Times Higher Education (THE)", CMU is ranked No. 265 overall (2nd in Taiwan, 1st among private universities). In addition, CMU also ranked highly in the subject rankings. The rankings for 2022 are as follows:

Ranking	Subjects
No.1 in Taiwan	Mathematics (ARWU)
	Food Science & Technology (ARWU)
	Cell Biology (U.S. News)
	Molecular Biology and Genetics (U.S. News)
	Genetics and Molecular Biology (Research.com)
No.2 in Taiwan	Agricultural Sciences (ARWU)
	Agricultural Sciences (U.S. News)
	Endocrinology and Metabolism (U.S. News)
	Engineering (U.S. News)
	Food Science and Technology (U.S. News)
	Oncology (U.S. News)
	Pharmacology and Toxicology (U.S. News)
	Biology and Biochemistry (Research.com)
Medicine (Research.com)	
No.3 in Taiwan	Human Biological Sciences (ARWU)
	Public Health (ARWU)
	Dentistry & Oral Sciences (ARWU)
	Pharmacy & Pharmaceutical Sciences (ARWU)
	Neuroscience and Behavior (U.S. News)
	Pharmacy & Pharmacology (QS)

International Collaborations and Events

Online Academician Forum Series

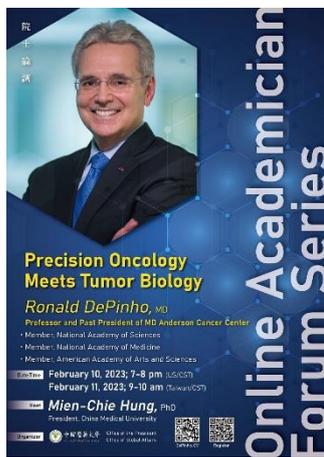
To facilitate advances in the biomedical sciences, CMU President Mien-Chie Hung created the "Online Academician Forum," a series featuring internationally renowned biomedical scientists. Since 2022, we have invited the highest caliber scholars from around the world to present topics at the frontiers of biomedical sciences and technology to our large community of students, trainees, and faculty at CMU/CMUH and institutions throughout Taiwan.

Four sessions have been held so far in 2023, with the following topics:



“Cancer genomics and genome-inspired cancer therapy”

by Matthew Meyerson, MD, PhD, Dana-Farber Cancer Institute, Harvard Medical School



“Precision Oncology Meets Tumor Biology”

by Ronald DePinho, MD, Professor and Past President of MD Anderson Cancer Center



“Wild type and Mutant p53 Activities”

by Guillermina Lozano, PhD, Professor and Chair, Department of Genetics, UT MD Anderson Cancer Center



“A new view on Cancer: from Molecules to single cells to the individuals”

by Marcia Haigis, PhD, Professor, Department of Cell Biology, Harvard Medical School

“Undergraduate Research Results Forum” Co-organized by College of Life Sciences and UT Austin Dean's Scholars

The College of Life Sciences has been actively promoting English academic exchange activities. On October 13, 2022, the college and UT Austin Dean's Scholars co-organized the fall session of the "Undergraduate Research Results Forum." The forum was a hybrid conference, and undergraduates from both universities took turns sharing about their research and having discussions.

CMU Vice President John S. Kuo was invited to give the opening remarks. Vice President Kuo introduced the UT Austin Dean's Scholars program to CMU students, and then the Dean's Scholars students talked about the concept and activities of their program. The forum attracted more than 100 students and faculty members, showing CMU's high anticipation and lively participation in this event.



During the forum, two students from CMU and two students from UT Austin shared their research topics. The discussion over the research will be of great help to the future research of the students from both universities as well as establishing future academic cooperation and exchanges. Vice President Kuo encouraged the College of Life Sciences to continue to make international academic exchanges, to broaden the international horizons of students and faculty members, and to cultivate global talents in life sciences.

CMU and Ludwig Maximilian University of Munich Held Joint Symposium on Acupuncture

On November 24, 2022, China Medical University and Ludwig Maximilian University of Munich (LMU) held a joint symposium on acupuncture. Professor Dominik Irnich, the President of the German Medical Acupuncture Association, and Dr. Petra Bäumlér of the Multidisciplinary Pain Centre, came to Taiwan to attend the joint symposium on behalf of LMU and to present their latest acupuncture research. On CMU's side, six members shared their research results, including Dean Hung-Rong Yen of CMU College of Chinese Medicine, Vice Dean Yi-Hung Chen, Assistant Professor Peter Karl Mayer, Assistant Professor Hsien-Yin Liao, Dr. Chien-Chen Huang, and Dr. Ming-Cheng Huang.

LMU is not only one of the best universities in Germany but also a top university in the world. Professor Irnich was the first physician in the world to adopt the method of randomized controlled trials in the clinical research of acupuncture, and he has published his results in the *British Medical Journal*. He also integrated acupuncture into Western medicine for pain treatment. Moreover, Professor Irnich is currently the President of the German Medical Acupuncture Association. The association has more than 8,000 members and regularly holds acupuncture research discussions.



CMU has been actively promoting the connection of Chinese medicine research to the world and encourages students and faculty to cooperate with top international academic institutions and scholars. Through this joint symposium, CMU and LMU will form research teams on four major themes of acupuncture, including acupuncture clinical trials, Tai Chi, big data, and basic mechanism research. It is expected that more research cooperation will be formed and that there will be more academic exchanges between the two universities.

Delegates of Ministry of Education, Science and Sport (Lithuania) Visited CMU for Academic Exchanges and International Cooperation

On February 4, 2023, delegates from the Ministry of Education, Science, and Sport (Lithuania) and the Lithuanian Academy of Sciences visited China Medical University for international academic exchanges. The Lithuanian delegates consisted of the Vice Minister of the Ministry of Education, Science, and Sport, the Director of the Department of International Cooperation and European Integration, the President and Vice President of the Lithuanian Academy of Sciences, and professors from Vilnius University.

CMU President Mien-Chie Hung was invited to Vilnius University and the Lithuanian Academy of Sciences in October 2022. He had academic exchanges with Lithuanian scholars and delivered a keynote speech; therefore, President Hung felt very cordial about the visit of Lithuanian scientists this time. During the meeting, President Mien-Chie Hung talked about the cutting-edge cancer research projects that CMU is currently conducting, and Dean Liang-Yo Yang made an introduction about CMU and the ongoing international research cooperation with world-renowned universities.

Through this visit, the President of the Lithuanian Academy of Sciences promised to facilitate research cooperation between CMU and the Lithuanian Cancer Research Center. In addition, the professors of Vilnius University will promote cooperation between China Medical University, Vilnius University, and other universities in Lithuania to discuss and establish a PhD dual degree as soon as possible to jointly



cultivate top biomedical talents.

Research Breakthroughs

Tannic Acid Proved an Effective Inhibitor of Coronavirus: President Mien-Chie Hung's Team Published Research Findings in *bioRxiv*

The latest research completed by President Mien-Chie Hung's research team, "The natural tannins oligomeric proanthocyanidins and punicalagin are potent inhibitors of infection by SARS-CoV-2 in vitro," was preprinted in the American Chemical Society's *bioRxiv*.

It is commonly known that grape seed extractant is rich in antioxidants. It can be made into an extract or capsule, which can be used as a nutritional supplement. To prove whether taking grape seed extract can increase protection against the coronavirus, the research team recruited healthy adults as subjects and randomly divided them into two groups. One group was given a placebo, and the other group was given a grape seed capsule to test if the serum was able to reduce the infection by coronavirus. The results showed that after taking grape seed capsules, the serum of the subjects was more effective in inhibiting the infection of wild-type or different mutants of the coronavirus. That is, seed-containing juice or grape seed extractant that is rich in polymerized proanthocyanidins can effectively inhibit the invasion of wild-type or mutant coronaviruses.



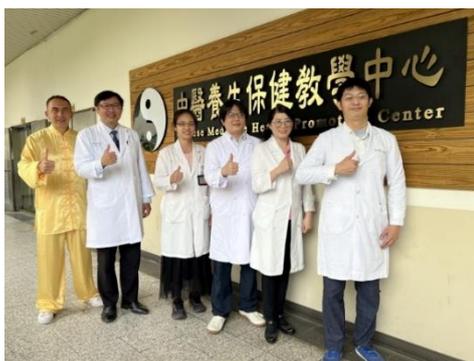
The COVID-19 pandemic is gradually subsiding. As borders open and we enter the post-pandemic era, how to make smart use of diet or nutritional supplements to live with viruses smartly and return to normal life has become a new study trend.

Practicing Tai Chi Can Help Improve Muscle Strength and Gait Balance: CMU Integrated Medicine Research Team Published Research Results in *Ageing Research Reviews*

Patients with sarcopenia and frailty who practiced Tai Chi showed better performance in limb muscle strength and gait balance, with a reduced number of falls and fear of falling. Compared with patients who do not exercise, those who practice Tai Chi have a better mental state and quality of life and have fewer depression symptoms. This study, "The effect of Tai Chi in elderly individuals with sarcopenia and frailty: A systematic review and meta-analysis of randomized controlled trials," by the integrated medicine research team led by Professor Hung-Rong Yen, Dean of CMU College of Chinese Medicine, was published in *Ageing Research Reviews*, a top international journal in the field of geriatrics.

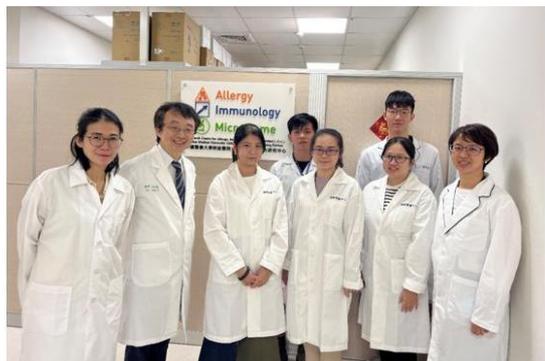
This study consisted of a total of 11 randomized controlled clinical trials conducted in 5 countries from 1996 to 2022, including 1676 elderly people with sarcopenia or frailty, and systematically explored the effects of Tai Chi on sarcopenia and frailty. Sarcopenia is an important factor that leads to disability in elderly people. After reaching the age of 40, our muscle quality will decrease by 8% every decade, up to 15% every decade after the age of 70.

Decreased muscle quality will lead to decreased skeletal muscle and function, slow walking, easy falls, reduced grip strength, and even disability. It not only affects the quality of everyday life but also increases the risk of death.



Dr. Peter Karl Mayer, who often practices Tai Chi, is an Assistant Professor in the CMU International Master Program in Acupuncture. Dr. Mayer is also a German doctor who holds a license as a Chinese medicine doctor in Taiwan. "Tai Chi is an exercise that can strengthen the body and relieve stress. It is a good exercise for all ages. The footwork of Tai Chi can strengthen the legs, improve the sense of balance, and prevent falls," said Dr. Mayer.

The integrated medicine research team consists of several professors and physicians, and they have incorporated Tai Chi into exercise prescriptions and brought it to the local community. The team provides Chinese medicine day care for patients with sarcopenia, providing another prescription option for them.



A Novel Method and Clinical Application for the Treatment of Chronic Obstructive Pulmonary Disease: The Research Team of Dr. Jiu-Yao Wang Published Findings in *Cellular and Molecular Immunology*

The clinical research team of Dr. Jiu-Yao Wang, Superintendent of CMU Children's Hospital, published their latest research, "Surfactant protein D inhibits lipid-laden foamy macrophages and lung inflammation in chronic obstructive pulmonary disease," in the journal *Cellular and Molecular Immunology* (Impact Factor: 22.1).

Chronic obstructive pulmonary disease (COPD) is a common chronic respiratory disease that not only deteriorates patients' lung function but also affects other body functions. It is a disease in which long-term inflammation of the respiratory tract leads to irreversible airway obstruction, making it impossible for air to flow in and out of the respiratory tract smoothly. The main causes are smoking, long-term exposure to smoke, and ozone air pollution. COPD is one of the top ten causes of death in Taiwan. However, there is still no effective way to treat chronic inflammation of the respiratory tract and stop the deterioration of lung function except to quit smoking and take steroids.

The team of Dr. Jiu-Yao Wang has long been dedicated to the research of COPD and has confirmed that lipid-rich foamy macrophages and abnormal lipid metabolism are the main causes of COPD. The surfactant protein D (SP-D) produced from type II alveolar cells can regulate the lipid metabolism of macrophages and improve the inflammation of COPD and the deterioration of lung function, thus providing a novel method and clinical application for the treatment and prevention of COPD. The results will surely benefit more patients.

Outstanding Awards

Assistant Professor Chih-Hao Wang Received the "Excellent Young Investigator Award" by the Asia Pacific Nutrigenomics Nutrigenetics Organization

Dr. Chih-Hao Wang, Assistant Professor of the CMU Graduate Institute of Biomedical Sciences, has been focusing on using the novel CRISPR gene editing and screening platform technology to develop brown fat activation genes and using metabolomics analysis methods to identify brown fat, regulate body nutrition, and regulate energy metabolism to find out the key factors of anti-obesity. With this research finding, Dr. Chih-Hao Wang stood out among young scholars from around the world and was honored with the "Excellent Young Investigator Award" by the Asia Pacific Nutrigenomics Nutrigenetics Organization.

The Asia Pacific Nutrigenomics Nutrigenetics Organization (APNNO) was founded in 2016 by the Australian nutritional toxicologist, Professor Michael Fenech. APNNO aims to promote the development of nutrigenomics and nutrigenetics by facilitating exchanges and collaborations between researchers, clinicians, and the nutrition industry in the Asia-Pacific region.



2022 Future Technology Award

Professor Gregory J. Tsay's Team develops "Precision Test Kits for Diagnosis of Rheumatoid Arthritis (IgG anti-BR1 ELISA)"

A significant breakthrough in the precision diagnosis of rheumatoid arthritis! The "Precision Test Kits for Diagnosis of Rheumatoid Arthritis (IgG anti-BR1 ELISA)," developed by the research team of CMU Professor Gregory J. Tsay, can be used in all arthritis patients. It can improve the sensitivity of the clinical diagnosis of rheumatoid arthritis, evaluate the response to disease treatment, relieve symptoms, and carry out treatments. By using an enzyme-linked immunosorbent assay (ELISA), it can quantitatively detect human serum and BR1 autoantibodies in plasma after treatment with EDTA or heparin.

"At present, there is no single test for the diagnosis of rheumatoid arthritis. Physicians must combine the patients' symptoms, joint examinations, x-rays, and blood tests for diagnosis. However, it is often because the judgment score cannot meet the standard that it affects the prescription of drugs. Therefore, it is important to develop novel biomarkers that can improve the detection sensitivity, evaluate the response to disease treatment, and relieve symptoms and carry out the following treatments." said Professor Tsay.



Professor Chao-Jung Chen's Team develops "Rapid prediction system for intelligent antibiotics-resistant bacteria"

In the current clinical inspection process, it takes about three to five days to provide the detection information to the clinician for antibiotic treatment evaluation, after bacterial species identification and antimicrobial susceptibility testing for the source of infection. The rapid prediction system developed by Professor Chao-Jung Chen's research team combines matrix-assisted laser desorption ionization-time-of-flight mass spectrometry (MALDI-TOF MS) and machine learning models to predict the phenotypes of different drug resistances of the same bacteria, so it can greatly shorten the time for providing supplementary medication instructions by 24–48 hours.

This system uses MALDI-TOF MS for protein mass spectrometry analysis to identify bacterial species, and at the same time, using the machine learning classification model developed by the team, it can directly classify drug-resistant bacteria and non-drug-resistant bacteria. The research team uses existing clinical big data to calculate the special performance map of drug-resistant microorganisms. After completing the bacterial identification process, whether it is a known drug-resistant bacterium can be confirmed immediately. This technology can assist in the precise use of clinical antibiotics in advance, shorten the hospitalization period for patients, and reduce the abuse of antibiotics.

Currently, the team has obtained a US patent and is cooperating with four hospitals. It has the largest bacterial library database known so far. This system can also combine rapid bacterial sample preparation methods, MALDI-TOF MS, and machine learning to obtain a bacterial resistance prediction system quickly. Furthermore, this technology can identify novel biomarkers of drug-resistant bacteria through mass spectrometry identification and try to find the downstream resistance mechanisms involved in the biomarkers so as to develop new detection methods and new antibiotics. In terms of industry, it can be applied to the bacterial strain testing system in hospitals and to prescribing medicine quickly to save costs. In addition, the protein biomarkers developed and identified from this system can be applied to the research and development of rapid chip detection and antibody-antibiotics.

