

# ICMS NEWSLETTER



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# News & Updates

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## The Way to UM – New Student Orientation 2024/25

On August 15, 2024, the ICMS held “The Way to UM – New Student Orientation” in Lecture Hall N21-G013. Professor Chen Xin, director of ICMS warmly welcomed all new students of



the 2024 cohort to the ICMS family and delivered a welcoming speech to usher in the new academic year. The event attracted nearly 200 participants, including new students from the Doctor of Philosophy in Biomedical Sciences, Master of Philosophy in Chinese Medicinal Science, Master of Philosophy in Medicinal Administration and Master of Science in Medicinal Administration programmes.

Subsequently, program coordinators Professor Lu Jinjian, Professor Chen Xiuping, Associate Professor



Bian Ying and Assistant Professor Ung Oi Lam. Subsequently, Professors Lu Jinjian, Chen Xiuping, Bian Ying, and Ung Oi Lam introduced the key points of each program. Additionally, ICMS administration and laboratory representatives explained course selection and laboratory training. Finally, ICMSPA Vice President Chen Junming introduced the latest updates to new students, inviting them to join ICMSPA in shaping the future of research together.



UM participates in “The Belt and Road Alliance for Traditional Chinese Medicine” as a founding member



The Presidents' Forum 2024 of the Belt and Road Alliance for Traditional Chinese Medicine was held at CUHK on 16 August. Over 30 presidents and representatives from traditional medicine-related universities and colleges gathered to discuss the internationalisation and modernisation of traditional medicine.

UM was invited as a founding member. Prof. Xin Chen, director of the ICMS and SKL-QRCM, attended on behalf of Rector Prof. Yonghua Song. Drawing on his 15+ years of research experience at the US NIH, Prof. Chen shared insights on the opportunities and challenges of internationalising and modernising Chinese Medicine, and highlighted the UM's efforts in this area.



## UM MCTCM receives Chinese medicine specimens from Shenzhen Institute for Drug Control



To implement its strategic cooperation framework agreement with the University of Macau (UM) and to support the development of the Macao Centre for Testing of Chinese Medicine (MCTCM) at UM, the Shenzhen Institute for Drug Control (SZIDC) donated 100 Chinese medicine specimens to MCTCM. The aim of the donation is to deepen the cooperation between Macao and Shenzhen





in the Chinese medicine industry and to promote the development of Chinese medicine testing in Macao.

The donation ceremony took place at SZIDC. On behalf of UM, Xu Jian, vice rector of UM, received the Chinese medicine specimens presented by Wang Bing, president of SZIDC. The two parties also held in-depth

discussions on future cooperation and reached a number of agreements. In appreciation of SZIDC's support, Li Shaoping, director of MCTCM, also presented the institute with a copy of the book *Quality Control of Chinese Medicines: Strategies and Methods*, co-edited by him and Zhao Jing, associate professor in the State Key Laboratory of Quality Research in Chinese Medicine and published by Springer. The UM delegation also visited the research facilities at SZIDC.

## UM MCTCM exchanges with renowned pharmaceutical companies in Macao and Hengqin



After obtaining accreditation from the China National Accreditation Service for Conformity Assessment (CNAS), the Macao Centre for Testing of Chinese Medicine, University of Macau (MCTCM, UM) has actively strengthened its connection with renowned pharmaceutical companies in Macao and Hengqin to better understand the industry's demand for Chinese medicine testing and to explore the development of the Chinese medicine industry in Macao.

Representatives from several pharmaceutical companies in Macao and Hengqin visited MCTCM for exchanges. They expressed their desire to strengthen cooperation with the centre. Li Shaoping, director of MCTCM, said that Macao is a bridgehead for Chinese medicine to go global, and MCTCM is a bridge between industry and academia. The fundamental mission of the centre is to provide technical assistance to the Pharmaceutical Administration Bureau of Macao, conduct registration testing and monitor testing, and contribute to the industrialisation and internationalisation of Chinese medicine in Macao. To date, 118 items tested by MCTCM have passed the CNAS on-site assessment.

## UM, Hubei University of Chinese Medicine jointly organise Chinese medicine seminar



To promote the inheritance and innovation of Chinese medicine and the high-quality development of the Chinese medicine industry, the Institute of Chinese Medical Sciences (ICMS) of the University of Macau (UM) and the Hubei University of Chinese Medicine (HBUChM) jointly organised a seminar on the inheritance and innovation of Chinese medicine. Experts, researchers, faculty members and students in the field attended the seminar to explore in depth the advantages of Chinese medicine in terms of economics, technology, culture, and ecological resources.

The seminar featured five presentations by scholars from UM and HBUChM, covering theoretical knowledge and clinical experience in the field of Chinese medicine. Liu Songlin, party committee secretary and president of HBUChM, stressed the importance of integrity and innovation in the development of



Chinese medicine. Liu Hongtao, professor at HBUChM, shared his experience of using Chinese medicine to regulate intestinal microecology and treat metabolic diseases. Mei Guoqiang, professor at HBUChM, discussed the clinical application and compatibility of Xiao Xian Xiong Tang (Minor Chest-Draining Decoction). Chen Xin, director of ICMS, talked about the immune regulation mechanism in Chinese medicine. Wan Jianbo, assistant director of ICMS, presented research on the chemical defence system in *Panax notoginseng*.

In addition, the HBUChM delegation met with Yonghua Song, rector of UM, and had in-depth discussions on topics such as the implementation of research and development cooperation in Chinese medicine, commercialisation of research results, and talent cultivation. They also visited the State Key Laboratory of Quality Research in Chinese Medicine and the UM Library.



# Academic Visits

## Delegation of University of Madeira, Portugal, visits ICMS for collaborations

On July 3, 2024, a delegation from the University of Madeira, Portugal, visited the Institute of Chinese Medical Sciences at the University of Macau to discuss potential collaborations. The delegation included Professor João Rodrigues, Director of the



Madeira Chemistry Research Centre, and Professor Helena Tomás, Head of the Department of Chemistry. The delegates were warmly received by Prof. Xin Chen, the Director of ICMS, and Prof. Jianbo Wan. Prof. Chen provided the guests with an overview of the progress and accomplishments of ICMS and SKLQRCM. The delegation also visited the ICMS laboratories and core facilities, where they expressed appreciation for the institute's modern and scientific approach to research and development of Traditional Chinese Medicine, particularly in the areas of chemical analysis and quality evaluation.

During the visit, both parties had fruitful exchange of experiences and ideas in research, teaching, and learning. Both parties recognized the potential for mutual benefits and the opportunity to contribute to advancements in the field of medical sciences. They looked forward to future collaborations between the two institutions.

## The School of Pharmacy at Zhejiang University visited ICMS for an academic and research exchange





On July 3, 2024, Prof. Lu Zhao, Prof. Wenjing Yuan, and 23 students from the School of Pharmacy, Zhejiang University, visited the ICMS and the State Key Laboratory of Quality Research in Chinese Medicine (SKL-QRCM) at the University of Macau. They were warmly received by ICMS faculty, including Prof. Jiahong Lu, Prof. Jinjian Lu, Prof. Ligen Lin, and Prof. Carolina Oi Lam

Both parties introduced their institutions, highlighting organizational structure, research achievements, and curriculum offerings. ICMS professors shared their research on modernizing traditional Chinese medicine, quality control, and tumor immunotherapy. The delegation toured ICMS and SKL-QRCM.

A student academic exchange session featured over 10 presentations on research topics. ICMS students also shared their research directions and experiences. Discussions covered academic planning, career development, and student life.

This exchange event fostered deep collaboration and communication between the institutes, aiming to promote traditional Chinese medicine and cultivate outstanding talents in pharmacy and traditional Chinese medicine. Both parties look forward to fruitful future collaborations.



## The Affiliated Hospital of Chengdu University of Traditional Chinese Medicine visits the University of Macau

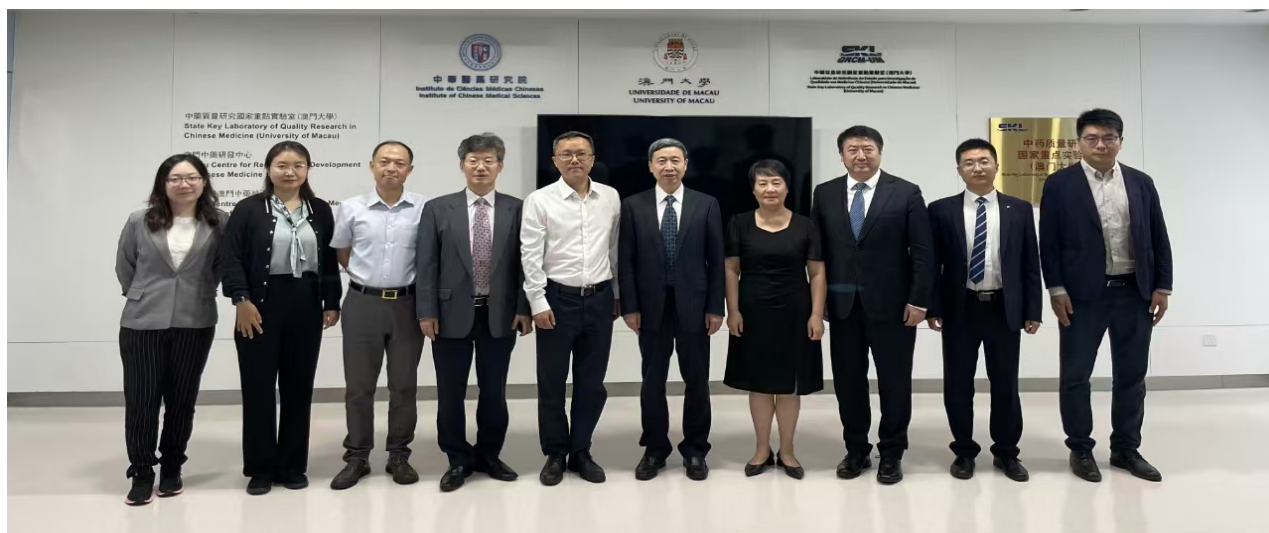
On August 21, 2024, Professor Li Tian, head of key disciplines at the Affiliated Hospital of Chengdu University of Traditional Chinese Medicine, led a delegation to visit the University of Macau. They were warmly received by Rector Yonghua Song.

Rector Song highlighted the long-standing cooperation between the two universities in teaching, research, clinical studies, and industrial transformation. He noted the University of Macau's significant investments in the Institute of Chinese Medical Sciences, the State Key Laboratory of Quality Research in Chinese Medicine, and the Chinese Medicine Testing Center, aligning with the Macau SAR government's



initiatives. Chengdu University of Traditional Chinese Medicine, one of the earliest TCM universities in China, has strengths in preserving and innovating traditional Chinese medicine, with valuable clinical research resources.

The delegation also visited the Institute of Chinese Medical Sciences, where Dean Professor Xin Chen introduced the institute's construction and research progress. Professor Li Zhou, deputy director of the Department of Otolaryngology, shared the scientific research situation of their hospital. Both parties discussed potential cooperation in treating inflammatory reactions and developing innovative products, aiming for a promising future of collaboration."



## The National Administration of Traditional Chinese Medicine Visits ICMS for Inspection and Guidance

On September 24, 2024, a delegation led by Dr. Wang Zhiyong, Deputy Commissioner of the National Administration of Traditional Chinese Medicine (NATCM), visited the Institute of Chinese Medical Sciences (ICMS) at the University of Macau. The delegation was accompanied by Prof. Mo Hui, Director of the World Health Organization Collaborating Centre for Traditional Medicine (Macau). They were warmly received by Prof. Li Peng, Deputy Director of ICMS, Prof. Hu Yuanjia, Dr. Wang Shengpeng, and Dr. Cheang Wai San from ICMS. The delegation conducted an on-site inspection of the ICMS's



Chinese medicine research and development laboratories and the pilot experimental platform for Chinese medicine preparations. They subsequently engaged in in-depth discussions and exchanges with ICMS representatives on promoting Chinese medicine development. During the discussions, Prof. Li Peng delivered a welcome speech and expressed sincere gratitude to the NATCM for its unwavering support for the development of Chinese medicine in Macau. Prof. Li introduced the overall situation and rapid development of the institute's traditional Chinese medicine disciplines in recent years, particularly highlighting the notable achievements in the transformation and industrialization of Chinese medicine research outcomes. Prof. Li stated that ICMS has been committed to promoting innovative research in Chinese medicine and maintaining close connections with international partners, striving to introduce Chinese medicine research results to the global market.

In his speech, Dr. Wang Zhiyong fully affirmed the significant achievements made by the University of Macau in the field of traditional Chinese medicine. He pointed out that the National Administration of Traditional Chinese Medicine attaches great importance to the development of traditional Chinese medicine in Macau. In recent years, the administration has successively introduced a number of policies, facilitating the development of Macau's traditional Chinese medicine industry. These initiatives have not only injected vitality into the development of traditional Chinese medicine in Macau but also brought new opportunities for the moderate diversification of Macau's overall economy. He encouraged the University of Macau to fully utilize this series of policy benefits to further promote scientific research innovation and the transformation of Chinese medicine achievements.





## Executive Director Chen Ke and team from The Innovation journal visited ICMS

On September 25, 2024, Executive Director Chen Ke from The Innovation journal and his team visited the Institute of Chinese Medical Sciences (ICMS) at the University of Macau (UM) for an exchange.

Researcher Chen Ke provided an overview of the international journal landscape and the need for independent domestic journals, shared the development history of The Innovation, and highlighted its broad academic coverage.

Prof. Chen Xin, Director of ICMS, showcased the institute's research facilities and achievements in traditional Chinese medicine. UM Vice President, Prof. Ge Wet, also met with the editorial team to explore collaboration opportunities.

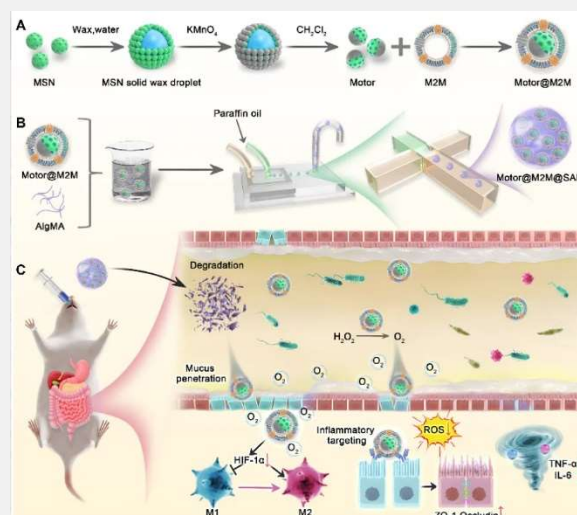
The Innovation has an impact factor of 33.2 and is a leading multidisciplinary journal. Notably, Dr. Ouyang Defang from UM was the first scholar from the university to publish in this journal.



## Research highlights

### The development of a novel oral formulation for ulcerative colitis

A research team led by Ruibing Wang, Professor at the Institute of Chinese Medical Sciences (ICMS) at the University of Macau (UM), has developed a novel oral formulation for the targeted therapy of ulcerative colitis. The research team had published two research articles in Nature Communications. Building on the previous research, the research team then developed an oral medication that does not contain small-molecule drugs. This formulation uses asymmetric M2 macrophage membrane-coated Janus nanomotors (M2 macrophage-biomimetic nanorobots) embedded in sodium alginate microspheres. The sodium alginate microspheres ensure the stability of the nanomotors in the harsh gastric environment and release them into the intestinal tract. The M2 macrophage membrane enhances the delivery efficiency of the nanomotors to the inflammatory colon and acts as a nanosponge to effectively neutralise inflammatory factors. The research is published in the prestigious journal Science Advances under the title 'Oral microsphere formulation of M2 macrophage-mimetic Janus nanomotor for targeted therapy of ulcerative colitis'.

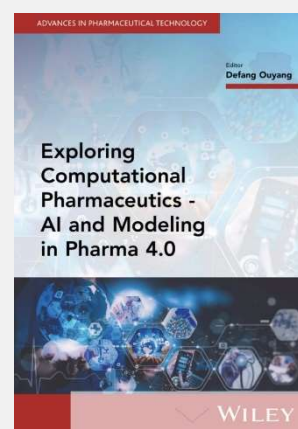


Schematic illustration of Motor@M2M@SAM preparation and its mechanism for UC treatment.

*Sci. Adv.* 2024, 10:eado6798

### UM scholar's book on computational pharmaceutics published by John Wiley & Sons

The book Exploring Computational Pharmaceutics – AI and Modeling in Pharma 4.0, edited by Ouyang Defang, associate professor at the Institute of Chinese Medical Sciences, the State Key Laboratory of Quality Research in Chinese Medicine, and the Department of Public Health and Medicinal Administration of the FHS at the University of Macau (UM), has been published by John Wiley & Sons, Inc. The book covering a wide range of topics including artificial intelligence, molecular modeling, process modeling, smart manufacturing, and quantitative pharmacology, the book reveals the physical, chemical, and data-driven keys to pre-formulation studies, formulation process studies, clinical studies, and precision medicine from a multi-scale perspective. Dr. Ouyang has integrated AI and multi-scale modeling into drug development processes. The latest edition highlights the progress made in recent years and is intended for pharmacologists, chemists, and researchers. For further information, visit: <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119987260>.



《Exploring Computational Pharmaceutics - AI and Modeling in Pharma 4.0》

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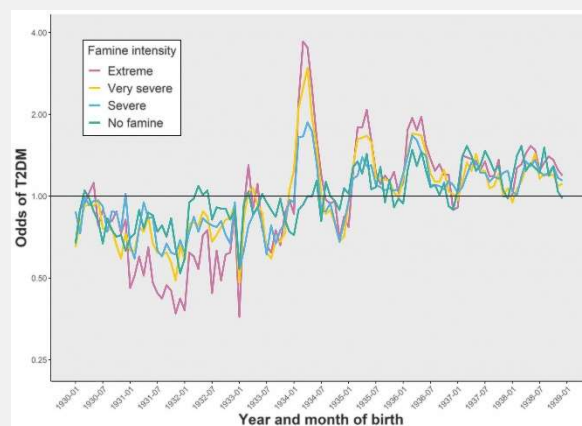


## Research highlights

### Dr. Chihua Li Participates as a Leading Researcher in a Study Published in Science

Dr. Chihua Li, Assistant Professor at the ICMS and SKLQRCM-UM, has published as a featured research article in the internationally renowned journal *Science* on August 8, 2024

(<https://doi.org/10.1126/science.adn4614>). Dr. Chihua Li is the second author and a key contributor to the study. Ukrainians born between 1930 and 1938. Out of these, more than 128,000 were diagnosed with type 2 diabetes in the early 2000s. The study found that early pregnancy is the most sensitive period for the impact of malnutrition. These findings lay the foundation for further research into the mechanisms behind increased diabetes risk. The study has garnered widespread attention from both the academic community and the public media. Dr. Chihua Li plans to apply epidemiological and interdisciplinary research methods to explore the determinants of health outcomes among the elderly population in Macau and the Greater Bay Area.

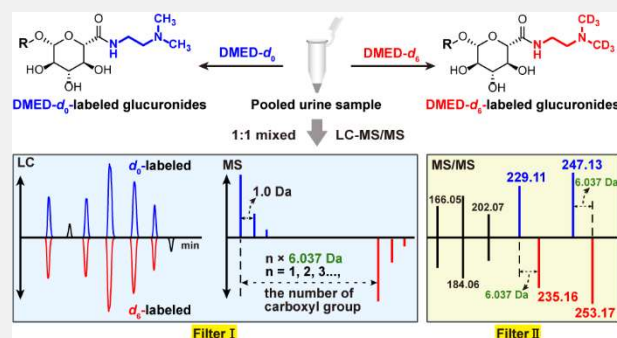


T2DM odds in Ukrainian regions grouped by famine intensity, by month and year of birth 1930 to 1938.

***Science*, 2024, 385: 667-671**

### Chemical isotope labeling and dual-filtering strategy for comprehensive profiling of urinary glucuronide conjugates

Glucuronidation is a common metabolic pathway for various endogenous and exogenous substances. Changes in glucuronidation homeostasis under disease or drug intervention can reflect the disease mechanism or affect drug efficacy or toxicity. The teams led by Wan Jianbo and Yan Ru, professors at ICMS, have jointly developed a dual screening strategy with isotopic labeling for targeted profiling of glucuronide conjugates in biological samples. First, carboxyl-containing compounds were extracted based on a characteristic mass difference ( $\Delta m/z$ , 6.037 Da) observed in MS between light- and heavy-labeled metabolites (Filter I). Then, glucuronides were further identified using two pairs of diagnostic ions ( $m/z$  247.1294/253.1665 and 229.1188/235.1559) originating from the derivatized glucuronic acid group in MS/MS (Filter II). Through this strategy, 685 potential glucuronides were screened from human urine, and 181 of them were annotated, mainly belonging to lipids, organic oxygen, and phenylpropanoids. Differentiated glucuronides were revealed from preliminary analysis of urine samples of colorectal cancer patients, which can serve as potential markers for the diagnosis. The research have been published in the internationally renowned journal *Analytical Chemistry*.



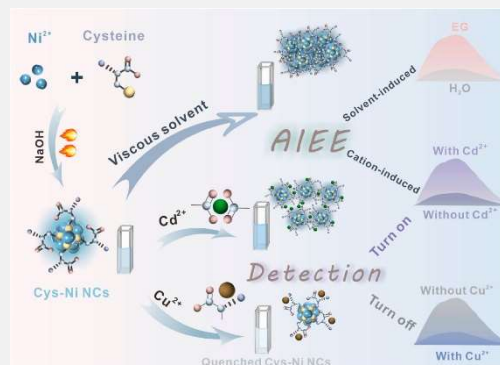
A schematic diagram of dual-filtering strategy based on chemical isotope labeling for comprehensive profiling of urinary glucuronide conjugates

***Analytical Chemistry*, 2024, 96(33):13576-13587**

## Research highlights

### A new luminescent nickel nanocluster with solvent and ion induced emission enhancement toward heavy metal analysis

Prof. Peng Li, Asst. Prof. Jinchao Wei and their research team recently published their latest study on a new fluorescent nickel nanocluster (Cys-Ni NCs) in the journal *Biosensors and Bioelectronics*. Extensive research into fluorescent nanoclusters based on gold, silver, and copper has demonstrated their exceptional photostability and low biological toxicity. Nevertheless, the endeavor to broaden the scope of fluorescent metal clusters to encompass other metals has proven to be a challenging pursuit. This study first synthesized a new water-soluble Cys-Ni NCs, with cysteine serving as both a stabilizer and reductant. Remarkably, they discovered both solvent- and cation-induced aggregation-induced emission enhancement (AIEE) effects, and its fluorescence intensity was positively correlated with the sample concentration. Moreover, they established fluorescent sensors for detecting  $\text{Cu}^{2+}$  and  $\text{Cd}^{2+}$  based on the Cys-Ni NCs with an accuracy of up to 93.94%. The research contributes to the diversification of fluorescent nanoclusters, enhancing their sensitivity and selectivity for the identification of heavy metal ions. It also opens up a new avenue for investigating them in the biological and medical fields.



Schematic diagrams illustrating the synthesis process of Cys-Ni NCs, the working principle of the AIEE effect, and the Cys-Ni NCs-based fluorescent probe for detecting heavy metal ions residues.

***Biosensors and Bioelectronics*, 2024, 264: 116660**



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