

Research reaching out

University of Macau (UM) Vice Rector for Research Wei Ge aims to boost the impact of the research and development carried out by the university and foster academia-industry collaboration. The “One Country, Two Systems” principle is the key advantage

The research blueprint is based on the “3+3+3+3” concept: three State key laboratories, three new key research areas, three interdisciplinary research fields, and three research platforms for humanities and social sciences. The rationale behind the strategy is to further elevate UM’s status as a research-intensive institution capable of climbing up the international rankings and playing a bolder role both in terms of the Guangdong-Hong Kong-Macau-Greater Bay Area (GBA) development and the SAR’s economic diversification. UM Vice

Rector for Research Wei Ge underscores that international rankings play a key role, because through such recognition “the university can attract better and better people”, meaning that it also “helps the city to attract more talents”.

Research output has indeed increased from 77 research papers published in high quality journals in 2007 to 2,025 in 2020.

The outcome is also reflected in the number of existing patents, which reached 107 last year cumulatively, and in the internationally recognized output of UM’s Microelectronics research and Traditional Chinese Medicine.

In fact, the establishment of the city’s State Key Laboratories (SKL) in 2010, following approval by the Ministry



UM’s 3 + 3 + 3 +3 strategy

3 State Key Labs

- Analog and Mixed-Signal VLSI
- Quality Research in Chinese Medicine
- Internet of Things for Smart City

3 New key research areas

- Precision medicine
- Advanced materials
- Regional oceanography

3 Interdisciplinary centres

- Artificial intelligence and robotics
- Cognitive and brain science
- Data science

3 Humanities and Social Science platforms

- Centre for Macau Studies
- Asia-Pacific Academy of Economics and Management
- Institute for Advanced Studies in Humanities and Social Sciences

focus on the prevention, occurrence, and metastasis of cancer cells, as well as on drug resistance and other major issues related to common cancers.

In addition, social sciences and humanities remain strategic for UM, Wei Ge states, highlighting the role played by the long-established Centre for Macau Studies. Bridging hard science and social sciences is the thrust of interdisciplinary platforms, and brain science is a case in point in this respect. “In the field of brain science many users are from humanities and social sciences, bringing two forces together”, and it is being used by scholars doing research on language acquisition, children cognition processes, as well as by researchers carrying out studies on ageing.

Another key direction is to forge closer bonds with private companies, linking research and industry in different ways. Professor Ge believes Macau can be turned into a design hub of high-quality products, which then can be manufactured in the GBA. Teaming up with local firms and companies across the border is becoming a reality, as shown by the partnership with Zhuhai-based giant Huafa, with whom UM signed a partnership to establish a joint laboratory. Wei Ge told Macau Business that, according to the agreement, the real estate group will contribute some 300 million yuan in five years’ time to this joint project.

UM faces increased competition from GBA universities, prompting a soul-searching with regards to Macau’s comparative and competitive advantages. For Wei Ge, the equation is crystal clear: “Macau’s most important advantage is the One Country, Two Systems concept. If we don’t make use of the One Country, Two Systems principle, Macau cannot compete with other cities in the Greater Bay Area”. ■

of Science and Technology, was a watershed for the city’s research and development activities. The first two - on Microelectronics and Traditional Chinese Medicine - highlighted the university’s progress at the time in these two fields, whereas the third SKL on the Internet of Things and smart city, set up in 2018, hinted at a focus on an emerging sector.

More recently, UM had “a more top-down approach, as it identifies some areas and provides the funds to these areas”, explained Wei Ge. The fields, which are regarded as particularly promising, are precision medicine, advanced materials and regional oceanography. “Hopefully, there will be one or two new State Key Labs coming out of these three major areas”. In this respect, precision medicine is regarded as a leading emerging sector.

In January, UM received approval from the Central Government to set up a centre for cutting-edge scientific research in precision oncology, which is set to be the first cutting-edge scientific research centre in Hong Kong and Macao. It will

“If we don’t make use of the One Country, Two Systems principle, Macau cannot compete with other cities in the Greater Bay Area”, Wei Ge, UM Vice Rector (Research)

ZUMRI

UM launched in 2019 “the first GBA industry-academy collaboration base” called the Zhuhai UM Science and Technology Research Institute (ZUMRI), alongside the Hengqin’s campus. ZUMRI was set up in partnership with the Zhuhai Hengqin New Area Management Committee.

The plans is to establish in ZUMRI five major research and development (R&D) centres and advanced training centres across a variety of fields, from microelectronics to traditional Chinese medicine, or smart city technology. ZUMRI is part of UM’s push to promote research knowledge transfer alongside the Centre for Innovation and Entrepreneurship, “a platform for faculty members and students to implement their creative ideas and commercialize their research results” and UMTec Limited, a commercial subsidiary of UM aimed at transferring research findings and intellectual for private businesses.