Getting the basics right

Tianjin Medical University's School of Basic Medical Sciences continues to push boundaries with innovative fundamental and translational research, and a world-class faculty.

Gaining intracellular insights

The Basic Medical School of Tianjin Medical University was founded in 1952. The school now has nine departments, six teaching and research sections and one basic medical experiment teaching centre. The school is the largest teaching unit in the university with 381 faculty members, including 282 full-time teachers, 87 of whom are professors and 88 associate professors. Currently there are 493 graduate students and 1463 undergraduates. Its international exchange network with more than 40 renowned universities includes Harvard University, the University of Cambridge, and the University of Toronto.

Based on China's 'double first-class' initiative, which confers preferential treatment and funding, the school participates in the undertaking of so-called 'first-class disciplines', and has formed a system with which it describes has having "optimized structure, concise direction and prominent focus". The school is ranked in the top one percent of the Essential Science Indicators for molecular biology and genetics, biology and biochemistry, pharmacology and toxicology, immunology and chemistry.

Driving basic research for clinical science

Defining the school's research success are significant discoveries on malignant tumours, cardiovascular and metabolic diseases, infectious and autoimmune diseases.

Focusing on the pathogenesis of epigenetic regulation in diseases, faculty projects include the biochemical activity of chromatin regulatory protein complex to identify the defects of the key histone modification disorders; genomic stability in different cancers; cell fate transformation and immune microenvironment interaction. Professor Yongfeng Shang, a fellow of the Chinese Academy of Sciences, is believed to be the first to establish the mammalian cell chromatin immunoprecipitation technology (ChIP) in the world, making an important contribution to the study of the interaction between DNA and protein. He has twice won second prize in the National Natural Science Awards. Professor Shang also led progress on the pathogenesis of epigenetic regulation. In cardiovascular research, an important discovery was identifying the significant role of the Hippo/YAP signalling pathway in regulating endothelial function by different blood flow, providing a potential drug target for atherosclerosis. The school was also the first to have combined analysis of animal models and susceptible population studying the role of different lipids, especially prostaglandins, at the sites of tissue damage or inflammation in cardiovascular injury and remodelling. In translational studies, TMU faculties collaborated with pharmaceutical companies to screen small molecule polypeptides for anti-tumour activity. The school also identified a tripeptide that has since been used in a clinical trial for tumor treatment and obtained independent intellectual property rights for it. Recently, a newly developed COVID-19 vaccine based on a chimpanzee adenovirus vector from the school is also entering clinical trials.

Recent decades saw the school gain increasing international recognition with its innovative and rigorous research. TMU researchers have published papers in Nature, Nature Chemical Biology, Cancer Cell, Cell Metabolism, and other top journals in the field.

Attracting World-Class Talent

Parallel to the rapid growth of the school has been the Basic Medical Research Center (BMRC), which was founded in September 2005 as a special academic zone of TMU. The Basic Medical Research Center is spearheading advances in fundamental life sciences and translational medical sciences.

Recruiting international researchers as principal investigators, the BMRC director takes executive charge and reports directly to the university president, overseeing projects across fundamental life science and translational medicine. Examples include molecular immunology, epigenetics, cancer biology, regenerative medicine, renal and cardiovascular biology, drug delivery, vaccine development and bioinformatics.

Supported by world-class research platforms, from proteomics, metabonomics, high-throughput drug screening, microscopic imaging and live animal imaging, BMRC hosts major research laboratories and core facilities for the entire university campus, providing technical support to TMU's staff and students.

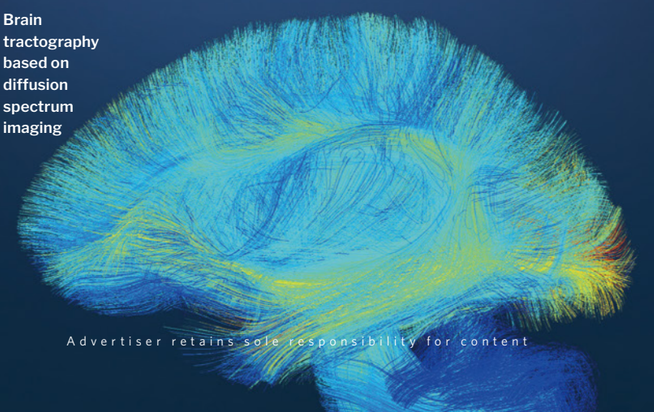
In the last five years, more than 30 outstanding scholars have been recruited and cultivated from around the world, including 19 national-level scholars and excellent young scientists; and 17 national science and technology major and key projects of China and five National Science Funds for Distinguished Young Scholars. Through the "1+X" cross-talk and in-depth research, these leading investigators produced first-class results including national science and technology awards. Recent research breakthroughs, published in international journals, mentioned above include novel mechanisms regarding atherosclerosis and innate immunity to epigenetic regulation of carcinogenesis.

A flexible hiring scheme also allows for world-class talent to be hired by both the Schools of Basic Medical Sciences and Clinical Medicine. BMRC will keep recruiting young talent from worldwide. They welcome enquiries. ■

Tailoring technology for success

The School of Medical Technology at Tianjin Medical University was founded in April 2019, with a history tracing back to 1984.

Combining clinical medicine with new technologies such as artificial intelligence, bioinformatics, and nanomedicine, the school accelerates the development of disciplines from medical imaging, laboratory medicine, rehabilitation therapy, optometry, and nutrition. Its investigations range from neuroimaging genomics and lifetime environmental exposures (exposome), exosome and molecular imaging techniques, as well as intelligent technologies for diagnosis, treatment and rehabilitation. The school aims to cultivate the next generation of talent in medical technology through cross-disciplinary integration. Led by Tianjin Medical University General Hospital, the Chinese Imaging Genetics (CHIMGEN) project collects genomic, neuroimaging and behavioural data from approximately 10,000 healthy Han Chinese participants, aged between 18 and 30 years, from 21 cities. As the current largest non-Caucasian cohort of neuroimaging genomics, CHIMGEN will facilitate differentiation of ethnic-shared and ethnic-specific genetic associations and the precision of fine-grained mapping. With the exposome, CHIMGEN can provide insights on both cumulative environmental effects and their vulnerable periods during the course of life. Data will be made available world-wide for scientific purposes. ■



Brain tractography based on diffusion spectrum imaging