HIM in Director's Lens: Today and Future

—— An Interview with CAS Member TAN Weihong, the founding director of the Hangzhou Institute of Medicine, Chinese Academy of Sciences

Turning five years old, the Hangzhou Institute of Medicine (HIM), Chinese Academy of Sciences (CAS) strives to play a pivotal role in boosting interdisciplinary research on the interface between innovation and medical science. As we peel back the layers of this cutting-edge institution, who better to guide us than its visionary director, Prof. TAN Weihong? In this exclusive interview with HIM Director Prof. TAN Weihong, who is also a CAS Member, we can grasp an idea of its unique position in China's scientific landscape, its major achievements, and its ambitious roadmap to excellence.

Graphic: HIM

Prof. TAN Weihong, the fouding director of the Hangzhou Institute of Medicine (HIM), said that the Institute aims to seize the high ground of scientific and technological innovations in the field of life and health.

BCAS: Prof. TAN Weihong, there is already a Chinese Academy of Medical Sciences (CAMS) in China. Why do we need an institute engaged in medical sciences under the umbrella of CAS? What is the initial purpose of this move? How different would it be from the institutes under CAMS?

TAN: The Chinese Academy of Medical Sciences (CAMS) focuses on basic medical and clinical research, whereas HIM focuses on promoting interdisciplinary medical science research at the physical, chemical, and biological interface and then translating fundamental scientific discoveries into clinical applications. With a strong foundation in natural sciences and technology from CAS, HIM boasts a wealth of outstanding researchers who collaborate with clinicians across multiple disciplines. This approach breaks new ground in medical research, offering new perspectives and integrative methodologies toward improving the diagnosis, treatment, and prevention of life-threatening diseases such as cancer.

During its initial phase, HIM leveraged its interdisciplinary advantages through the implementation of the 14th Five-Year Plan of China, proposing three major research directions: nucleic acid molecular medicine, intelligent molecular diagnostics and novel platforms for targeted drug delivery, and translational research designed to improve diagnostic accuracy and treatment efficacy. Additionally, three exploratory research areas were identified: medical synthetic biology, molecular mechanisms of traditional Chinese medicine, and DNA machines supported by artificial intelligence medicine.

BCAS: Would you briefly introduce some recent influential research achievements of your institute?

TAN: During the COVID-19 pandemic, HIM secured approval for the country's first molecular diagnosis point-of-care testing (POCT) product for COVID-19 and obtained CE certification for its nucleic acid aptamer antigen rapid test kit. HIM also pioneered the world's first nucleic acid aptamer contrast agent and radiopharmaceuticals, with successful outcomes in more than 100 clinical trials.

Moreover, four nucleic acid aptamer-conjugated drugs and tumor mRNA vaccines with proprietary intellectual property rights have entered preclinical research. The original establishment of a novel molecular subtyping method for triple-negative breast cancer has progressed to nationwide multicenter clinical studies, offering promising new diagnostic and treatment options for this highly malignant tumor.

Finally, the HIM and Zhejiang Cancer Hospital jointly constructed the first Heavy Ion Medical Center in Zhejiang Province. Now, the facility is beginning to treat patients. Its medical device-related achievements have transitioned to the product marketing stage. With over 300 publications in renowned

journals, such as Science and Nature Medicine, the Institute's pioneering advancements in gastric cancer diagnosis and treatment technologies earned it first prize in the Zhejiang Province Science and Technology Award presented in 2023.

BCAS: What are the layout and future development goals for your institute? What opportunities and challenges is it facing?

TAN: By 2027, HIM expects to become a world-class medical research institute supported by a collaborative system within a clearly defined interdisciplinary framework. Key research areas will reach the forefront of global science, producing innovative results and continuously acting as incubators for aspiring independent researchers. This, in turn, will serve to upgrade our biopharmaceutical industry, positioning HIM as a leading innovation platform for the life and health sciences. In the years to follow, HIM is expected to become an international hub for top-tier medical research talent, representing an array of disciplines. As a global frontier in diverse areas of medical research, we envision the formation of a fertile "biopharmaceutical valley," strengthening HIM as a major force within the national medical sciences strategy, placing it among the world's leading medical research institutions.

We see numerous opportunities on the horizon. By strengthening our partnerships with international research institutions and experts, we aim to enhance knowledge exchange and attract top talents while gaining access to cutting-edge resources and technologies. We're also looking to capitalize on rapid advancement in fields such as genomics, AI, and biotechnology, which offer new tools and approaches for medical research and innovation. Collaborations with biopharmaceutical companies present opportunities for technology transfer and the commercialization of our research findings. Additionally, we're investing in comprehensive training and development programs to nurture researchers who embody our culture of collegiality, creativity, and collaboration.

However, we also face several challenges in realizing these goals. Funding constraints could potentially limit our ability to invest in crucial infrastructure, equipment, and recruitment efforts. Navigating stringent regulatory requirements for clinical trials and product approvals may slow our research progress and commercialization endeavors. We're also operating in a highly competitive landscape, both domestically and internationally, which challenges us to continuously innovate to attract top talents and secure research funding. The process of translating our research findings into commercial products and therapies presents its own set of hurdles, particularly in areas of intellectual property protection and establishing effective commercialization pathways.

To address these challenges and capitalize on opportunities, we're working closely with government bodies to ensure supportive policies and a favorable regulatory environment. We're also developing strategies to offer competitive compensation packages and career development opportunities to retain our talented researchers in the face of global competition.

Despite these challenges, we remain optimistic about our future. With continued government support, strategic collaborations, and our commitment to excellence in research and innovation, we believe that HIM can effectively leverage these opportunities and navigate these challenges toward the realization of our 2027 goals and beyond.