

UNIVERSITY-INDUSTRY COLLABORATION FOR CHINESE MEDICINE INNOVATION IN THE GREATER BAY AREA

RECOMMENDATIONS FOR OPTIMIZING DEVELOPMENT



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The Hong Kong Polytechnic University
Research Centre for Chinese Medicine Innovation
Policy Research Centre for Innovation and Technology

University-Industry Collaboration for Chinese Medicine Innovation in the Greater Bay Area

Introduction

Chinese Medicine (CM) and Integrative Medicine are towering presence in China and around the world. In recent years, the Central government has announced a series of legislations and policies to facilitate the development and wider adaptation of CM, especially in GBA, and globally, including 《中醫藥發展戰略規劃綱要（2016—2030年）》、《廣東省嶺南中藥材保護條例》、《粵港澳大灣區藥品醫療器械監管創新發展工作方案》、《簡化在港澳已上市傳統外用中成藥註冊審批》、《關於支援國家中醫藥服務出口基地高品質發展若干措施的通知》、《粵港澳大灣區中醫藥高地建設方案（2020—2025年）》 and 《中醫藥振興發展重大工程實施方案》。

With its East-meet-West heritage, favourable geopolitical environment and ready-financing, Hong Kong has established its distinctive edge to become a global leader in the innovation of CM. With the right policies in place to support scientists, medical and industry professionals, Hong Kong has the best potential among top-tier cities to drive scientific breakthroughs of CM with global significance. By revealing scientists' and industry experts' insights, it is hoped that this paper could lead to effective strategies for policymakers to capitalise on the opportunities brought by the dynamic GBA consumer market and talent pool, translating CM research into policy, practice and innovation that have a profound impact on the health and wellbeing of the national and global population.

On 2 Mar 2023, the Research Centre for Chinese Medicine Innovation (RCMI), the Policy Research Centre for Innovation and Technology (PReCIT) of The Hong Kong Polytechnic University (PolyU) and the Modernized Chinese Medicine International Association (MCMIA) co-organised “University-Industry Collaboration on Chinese Medicine Innovation Forum” to drive Chinese medicine (CM) innovation in the Greater Bay Area (GBA). The forum brought over a hundred academic and industry leaders from the GBA to formulate policy recommendations to policy makers on how to deepen collaboration to promote CM development and grasp the research and business opportunities in the GBA.

Recommendations

1. Enhancing Hong Kong's CM Research and Development Ecosystem

The HKSAR Government has been pooling significant resources to promote CM development. For instance, the commission of the first Chinese Medicine Hospital (CMH) in 2025 and the Chinese Medicine Development Fund (CMDf) are major investments by the Administration to integrate CM into its primary healthcare system and the overall national development. However, there are still significant barriers preventing CM development from achieving its full potential, such as the fragmented and limited funding mechanisms. The funding on CM research was relatively limited compared to that on Western medicine. While CM has a long history and is widely used in Hong Kong, it faced challenges in gaining full recognition and acceptance in the broader medical community. This lack of recognition may have affected the amount of funding allocated to the field. Besides, the healthcare system in Hong Kong predominantly focused on Western medicine, which further limited the allocation of resources and funding to Chinese Medicine. These barriers limit researchers' access to the full range of support. Researchers, who lack mature mechanisms to overcome technical barriers and translate research findings into innovations, might end up with expectation mismatches and thus stagnant progress in research and discovery.

With a view to creating a supportive and robust environment which could render all-encompassing support to the CM development at different levels, we urge the Administration to construct (1) a central research platform which comprises **an Evidence-based Chinese Medicine Research Centre**; and (2) **an International Dietary Supplement and Botanical Drug Research Centre**, details are as follows:

- i) Evidence-based Chinese Medicine Research Centre
 - o PolyU's allied health departments, such as Rehabilitation Science, Optometry, Nursing and Health Technology Informatics, have been engaging in world-class research and making ground-breaking contributions to the understanding of diagnostics, therapeutics, acupuncture, martial arts and medicinal treatment. By partnering with the Schools of Chinese Medicine of the three local universities, including Hong Kong Baptist University, University of Hong Kong and Chinese University of Hong Kong, and CMH hospitals nationwide, Hong Kong and the Mainland could complement each other's strengths by leveraging the latter's scale and speed advantages in scientific research and its enormous population for clinical and genomic data while reaching the former's pinnacle as a quality assurance platform which offers fine details for research and clinical practices from education to research and service provision.
 - o Based on the unique experiences in East-meets-West rehabilitation, the strengths of each approach could be combined in order to promote mental and physical well-being – from perinatal and child development to end-of-life care.

- Crosscutting research could be expanded to cover the integration of martial arts, including Tai Chi, Qigong and acupuncture, into the healthcare system for the management and prevention of diseases and conditions as well as for the maintenance of health and well-being.

- ii) International Dietary Supplement and Botanical Drug Research Centre
 - Chinese Medicine has a long history of use in promoting health and well-being. Many Chinese herbs and botanicals have been traditionally used as dietary supplements to support various aspects of health, such as boosting the immune system, improving digestion, or enhancing vitality. CM takes a holistic approach to health, focusing on balancing the body's energies and addressing the root causes of health prompting approach aligns well with the concept of dietary supplements aimed at overall well-being rather than just treating specific symptoms.

 - By investing in research on CM-based dietary supplements, the International Dietary Supplement and Botanical Drug Research Centre can contribute to the scientific validation of CM's efficacy and safety. This could lead to greater acceptance and integration of CM practices into mainstream healthcare, thereby potentially reducing pressure on medical services by offering alternative and complementary approaches to patient care.

 - The Centre would be committed to conducting basic research, pre-clinical and clinical trials, conducting cutting-edge research on the evaluation of the safety and efficacy of traditional medicine as well as analyses of the multifactorial effects of CM formulae and herbs in different stages of diseases, particularly in areas of metabolic syndromes and women health. Not only would it translate research to commercial products to address new regulatory in China and international countries, it would also cater for the increasing pressure on medical services in Hong Kong and address the demand on the use of CM and health products in healthcare in China and international markets.

The Government should review the Chinese Medicine Development Fund in terms of its research components:

- Call for proposals should be strategically based on research topics in line with the GBA development, covering the CM development in different levels – pre-clinical and clinical research, education and training, clinical service, and law-based regulation.

- An additional research funding for field experts in CM and other disciplines to enhance academia-industry and interdisciplinary collaboration should also be

opened for field experts' application to enable basic, applied and translational CM research to achieve both academic rigour and practical relevance.

- A research platform fund for industry-oriented R&D projects with potential for commercialisation could be developed with a view to fostering a deeper physiological and biological understanding of the underlying mechanism for CM-related clinical practice, in order to allow more effective and widespread application of complementary and integrative CM-related healthcare solutions.

Constant exposure to knowledge exchange activities (such as seminars and conferences) at local, national and international levels could orchestrate exchange between the best brains who are leading path breaking work in their respective fields. It is suggested that the Administration could leverage the connections and opportunities brought by the CM High Grounds Development Plans to create synergy among the local start-ups and global players to spark innovation and unlock business opportunities. The Chinese Medicine Development Fund could include a dedicated scheme for such activities, similar to the ITF General Support Programme (GSP), which supports non-R&D projects that contribute to the upgrading and development of our industries

Research talents are the key to innovation. To nurture top science talents with multidisciplinary exposure and to make the GBA an attractive destination for global talents to pursue CM studies, the Government should financially support collaborative training programmes between GBA tertiary institutions and CM hospitals in local/ mainland to nurture younger researchers and achieve a sustainable and global-compounded CM talent pipeline.

2. Promoting the Internationalisation of Chinese Medicine

The GBA, is the origin of Lingnan medicine, not only serves as an ideal research and production base but also a global export base of CM products and services. Despite the strengthening of Good Manufacturing Practice (GMP) which enhances the standard and integrity of CM and herbal products, the lacks of consistent quality control standards and regulatory frameworks between borders might restrict market expansion, hampering trading of scientific products and stunning service and economy development in the long run.

Policy action is critical to creating a favourable research environment. To support the conservation of the peculiar Lingnan medicine and its innovation, the Government should establish multidisciplinary research institutes to facilitate collaboration among academia, researchers, clinicians, entrepreneurs and investors. A separate funding should also be established.

The Government should expedite the approval and mutual certification mechanisms of Chinese proprietary medicine among GBA cities, incentivising cross-boundary collaborations for translational research and product development, while fostering evaluation process and entrance of products into each market.

The Government should strengthen relevant research and forge cross-border partnerships and transactions, while promoting the convergence of Chinese medicine standards with international standards and continually integrating with the global regulatory framework to facilitate the export of high quality Lingnan CM brand to the international markets.

3. Commercialisation and Innovation of CM Health Maintenance Products

While Guangdong has been the major supplier of Lingnan medicine exporting over 2,600 species of medicinal herbs over the past few decades, Hong Kong could leverage its competitive advantages to play its role as a collaborative marketing management centre to promote such products to foreign countries and beyond. The fast-moving and dynamic consumer market of the local and mainland China and the synergistic effect between Hong Kong and GBA could foster the growth of such industrialisation hub, and reach consumers worldwide.

Commercial applications and translations of basic research require partnerships and integration of technologies from pharmaceuticals and biotechnology companies. To bring CM-based innovation to market, translate them into products of high R&D intensity with long product life cycles, and respond quickly to market needs, the government should create a supportive innovation ecosystem with innovation-specific policies to facilitate coordination, communication and collaboration between the academics and industries across borders.

The Government should also enhance the branding capabilities of GBA CM products. In addition to establishing the corresponding traceability system, it is also recommended that the Government could revitalise the traditional CM industry and its products by creating new value propositions, such as “Designed / Made in Hong Kong/ Macau”, to explore business opportunities at local and international levels.

The accelerated ageing population and delayed retirement have led to an enhanced affordability for healthcare services and health maintenance products. To tap the business opportunities emerging from the soaring healthcare demands, CM-based Health Maintenance Products and functional food, which feature “From Farm to Pharm” and “Food and Medicine Homology”, could be promoted to establish access to nutrition in the global aging population. Regulation for functional foods that could foster and support the development of CM-based Health Maintenance Products could also be established.

By making use of the security and immutability of blockchain technology, the Government could create a three-way trading and cross-border cooperative blockchain platform for completing projects’ electronic contracting, circulation and traceability procedures to bridge the needs of various sectors.

4. Constructing a Bio-digital Products Innovation Hub

Digital innovations and new technologies, such as sensors, internet-of-things, and artificial intelligence, coupled with CM treatment modalities, would be instrumental for enhancing efficiency and effectiveness in CM inpatient services and outpatient follow-up. The University is pleased to note the HKTDC's recent CM advances, "WeThearpay", a comprehensive clinic management platform for AI-driven tongue imaging to support diagnoses and predict health issues and internal health imbalances. However, it takes years to translate an innovative idea into a marketable product, not to mention the redundancy in administration during different phases of product development.

To cater for the anticipated clinical staff shortage to meet future therapeutic needs, the Administration is urged to boost Hong Kong's upstream I&T capacities and scale by modifying funding requirements and providing incentives to stakeholders to support bio-digital products and assistive devices development. The Administration should increase R&D investment and relax requirements and subsidy ratio to support start-up companies and Small and medium-sized enterprises (SMEs) to access for different funding schemes to transfer their innovation into biopharma pipeline and bio-medical technologies.

The Administration is suggested to consider integrating citizens' insurance and annuities data into its digital CM health and wellness platform. With the growing maturity of digitalisation in local primary and CM healthcare, this could improve the efficiency of consultation and pathological interpretation, as well as secure robust healthcare and clinical data for driving sustainable scientific advances and breakthroughs.

Contributors

- **Professor M.S. WONG**
Director of Research Centre for Chinese Medicine Innovation and Professor of Department of Food Science and Nutrition, The Hong Kong Polytechnic University
- **Professor Eric CHUI**
Head and Professor of Department of Applied Social Sciences and Co-Director of Policy Research Centre for Innovation and Technology, The Hong Kong Polytechnic University
- **Dr Oscar CHAN**
Research Assistant Professor of Policy Research Centre for Innovation and Technology, The Hong Kong Polytechnic University
- **Professor Christopher CHAO**
Vice President (Research and Innovation) and Director of Policy Research Centre for Innovation and Technology, The Hong Kong Polytechnic University
- **Professor Wing-tak WONG**
Chairman of the Hong Kong Council for Testing and Certification

About Research Centre for Chinese Medicine Innovation (RCMI)

The Research Centre for Chinese Medicine Innovation (RCMI) was established under the PolyU Academy for Interdisciplinary Research (PAIR) in October 2021. Led by Prof. Man-sau WONG, Professor in the Department of Food Science and Nutrition and Director of RCMI of PolyU, the Centre aims to foster interdisciplinary and translational research for developing novel drugs, new treatment protocols and programmes based on CM practices for application in clinical settings or the community, thereby bringing CM innovations into clinical practice and informing relevant policy.

RCMI Website: <https://www.polyu.edu.hk/rcmi/>

Contact: info.rcmi@polyu.edu.hk

About Policy Research Centre for Innovation and Technology (PReCIT)

The Policy Research Centre for Innovation and Technology (PReCIT) was founded in 2022 as a university-level interdisciplinary policy research centre. Led by Prof. Christopher CHAO, Vice President (Research and Innovation) of PolyU and Director of PReCIT, and Prof. Eric CHUI, Head of the Department of Applied Social Sciences and Co-Director of PReCIT of PolyU, the Centre aims to support Hong Kong's innovation and technology (I&T) development in the GBA via interdisciplinary collaborative research including but not limited to carbon-neutral cities, I&T development in the GBA, and the Belt and Road Initiative's development in Southeast Asia.

PReCIT Website: <https://www.polyu.edu.hk/precit/>

Contact: precit.office@polyu.edu.hk



