香港浸會大學
HONG KONG BAPTIST UNIVERSITY

Institute for Innovation,
Translation and Policy Research
創新 › 轉化及政策研究院

NEW DRUGS & HEALTH TECH AT HKBU

Translating Innovation &
Creativity for Impact

Contents

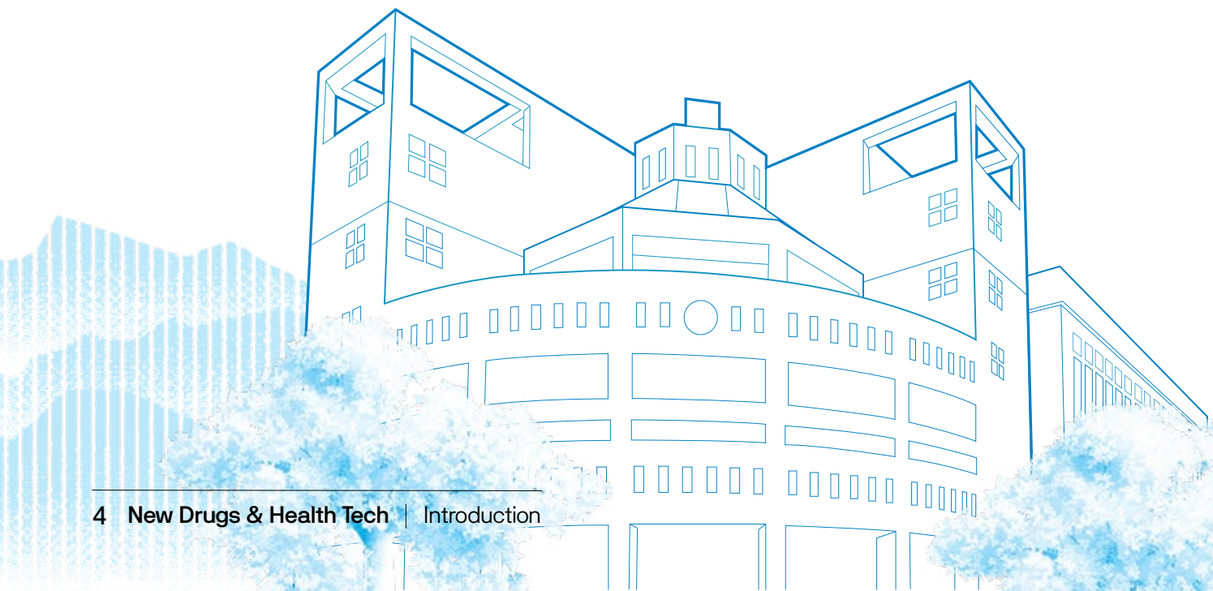
NEW DRUGS AND HEALTH TECH

enable us to explore the intricate mechanisms of living organisms and unlock groundbreaking biological insights that pave the way for advancements in health and medicine.

HONG KONG BAPTIST UNIVERSITY

Hong Kong Baptist University (HKBU) is committed to the pursuit of excellence in education, research and service to the community. As one of Asia's finest institutions of higher learning, HKBU is dedicated to nurturing future generations of civically engaged community members, and it provides them with a broad-based, transdisciplinary and creative education. Its seven faculties/schools offer a wide array of programmes across a diverse range of disciplines, from the arts, business, communication, and social sciences to science and technology, Chinese medicine and sport.

HKBU offers an education and research environment that fosters technological progress with a focus on the human dimensions. At the same time, the University is using technology to push the envelope of human imagination in the arts and cultural sphere. Coupled with our unceasing efforts to achieve breakthroughs in science and Chinese medicine, HKBU strives to contribute to the building of a better world and a more compassionate society.



OUR STRATEGIC CLUSTERS

Art, Culture and Creative Media

Film, Literary Arts, Music, Visual/Media Arts

Data Analytics and AI

Enabler for applications such as journalism, business and finance, science and art

Health, Chinese Medicine and Drug Discovery

Chinese medicine, Chemistry, Microbiology, Ageing, Physical Education

Humanities and Cultures

Philosophy, Literature, Geography, History, Political Science, Communication, Economics, and the like

Institute for Innovation, Translation and Policy Research
創新 › 轉化及政策研究院

TRANSLATING INNOVATION & CREATIVITY FOR IMPACT

The Institute for Innovation, Translation and Policy Research (ITPR)

at HKBU is dedicated to driving innovations, research and development, technology translation, and applications to enable HKBU to respond to emerging challenges and opportunities globally, nationally, and under the aegis of the Hong Kong SAR Government' s top policy priority on innovation and technology development.

We strive to bridge the gap in technology readiness between academic innovation and industry applications in order to bring HKBU's innovations for the well-being of the society.

ITPR comprises three sections

Innovation and Entrepreneurship

Technology Translation

Policy Research

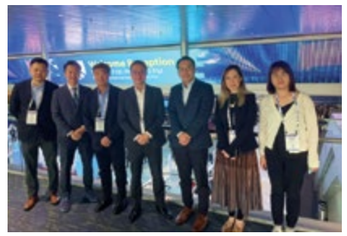
each being instrumental in fostering a vibrant ecosystem at HKBU conducive to technology translation and collaborations.

The all-round business development, scientific, and policy research support will anchor HKBU's robust and sustainable development.

STRATEGIC ALLIANCE AND ENTREPRENEURSHIP

Accelerating Technology Translation and Application

To bridge the gap in technology readiness between academia and industry in technology development, ITPR strives to enhance HKBU's innovation capacity and improve our research and technology development capabilities through proactive outreach and engagement with strategic partners and investors. We achieve this by establishing collaborative platforms, engaging stakeholders, facilitating high-impact innovation, and conducting multidisciplinary R&D.



ITPR offers support and resources to mature technology and startups of HKBU in realising their potential to generate social, economic, and cultural impacts. To showcase the potential of technology, ITPR identifies anchor events in different industries to participate and demonstrate technology applications to industry players and investors.

TECHNOLOGY TRANSLATION

Anchoring Technology Application

ITPR offers infrastructure to support HKBU's translational research.

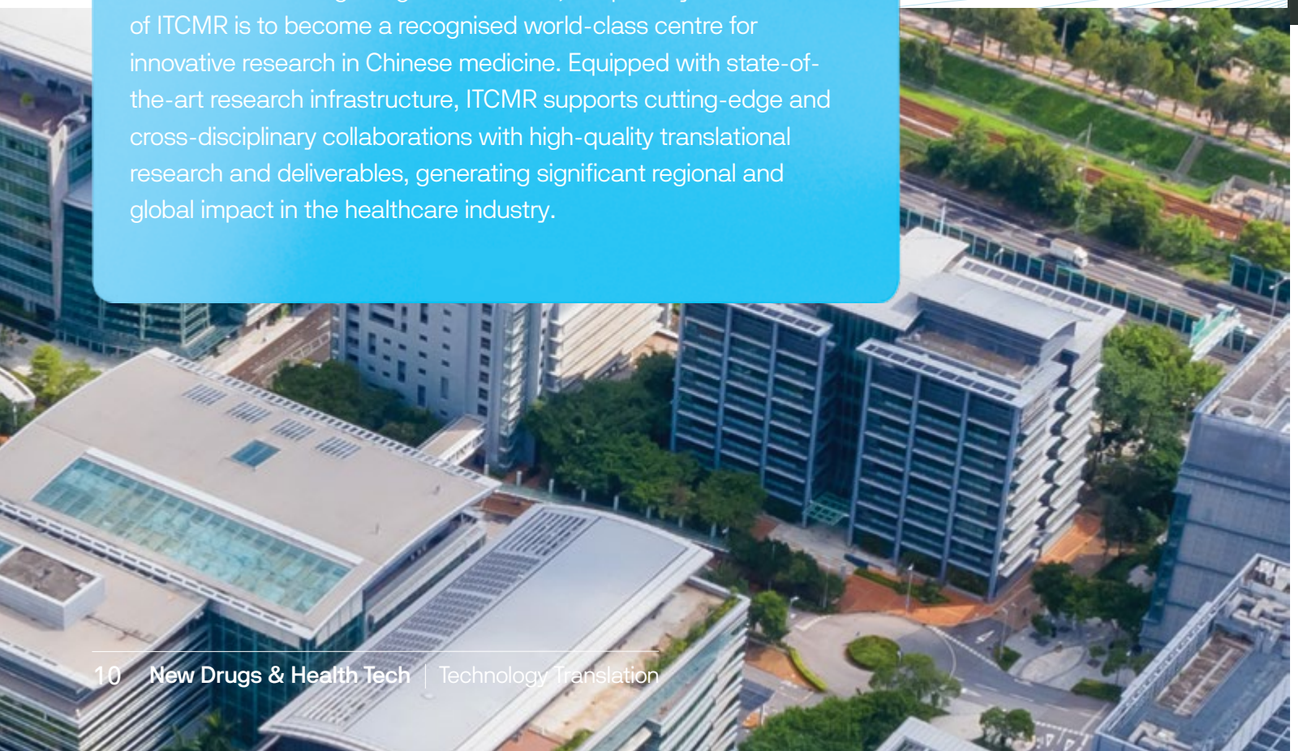
We provide resources and expertise for technology development and demonstration, while we also serve as a training hub to cultivate the next generation of scientists and researchers.

Our aim is to equip them with the necessary skill set and know-how for technology applications. Our flagship translational infrastructures include:

01

Wu Jieh Yee Institute of Translational Chinese Medicine Research (ITCMR)

Located at the Hong Kong Science Park, the primary mission of ITCMR is to become a recognised world-class centre for innovative research in Chinese medicine. Equipped with state-of-the-art research infrastructure, ITCMR supports cutting-edge and cross-disciplinary collaborations with high-quality translational research and deliverables, generating significant regional and global impact in the healthcare industry.



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CHRYSALIS HKBU Art Tech Incubation Hub

Located at the Jockey Club Creative Arts Centre (JCCAC), CHRYSALIS is dedicated to fostering the incubation of cutting-edge Art Tech projects and entrepreneurial activities by providing a creative environment for our innovators and artists.

We support technology development and streamline the process of translation and demonstration, with the aim to bridge the gap between artistic vision and technological innovation.

PLATFORM AND INFRASTRUCTURE

Building collaborations and having state-of-the-art infrastructure play crucial roles in driving successful research and development (R&D) and technology translation for universities. Collaborations enable researchers to tap into a diverse pool of expertise, resources, and funding, fostering innovation and accelerating the pace of discovery all the way through to application. By partnering with industry, government, and other stakeholders, universities can leverage complementary strengths, share knowledge, and tackle complex challenges collectively.

Additionally, having well-equipped lab infrastructure is essential for conducting cutting-edge research. Advanced laboratories provide researchers with the necessary tools, equipment, and technologies to explore new frontiers and push the boundaries of knowledge. They create an environment that fosters creativity, collaboration, and interdisciplinary research.

Hong Kong Applied Science and Technology Research Institute
Developing cutting-edge technologies and propelling technology transfer

Hong Kong-Shenzhen Innovation and Technology Park Limited
Supporting HKBU's translational R&D and gaining market access needs for HKBU's start ups and entrepreneurs

China Resources Enterprise, Limited
A joint centre in smart Chinese medicine with China Resources Enterprise

SPH-Inno
Facilitating development of HKBU's startups, entrepreneurship and collaborative research empowered by Shanghai Pharma for innovative life science ventures, featured with state-of-the-art facilities and a tailored ecosystem

UMP Healthcare Group
Exploring cutting-edge models of Integrative Chinese-Western Medicine

Surrich International Co., Ltd.
Promoting cooperation on technological innovation, incubation programme, project investments and talent exchanges.

Department of Science and Technology of Guangdong Province
Establishing collaborative research projects that can lead to transdisciplinary innovation and knowledge transfer

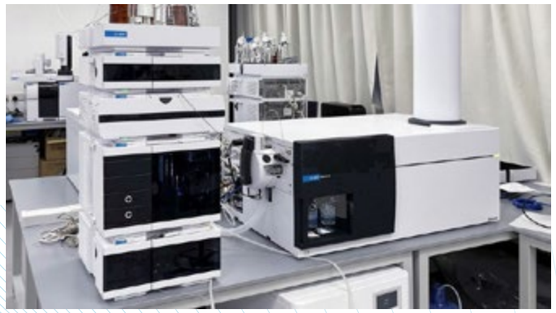
CENTRE FOR CHINESE HERBAL MEDICINE DRUG DEVELOPMENT

An InnoHK R&D Centre

Centre for Chinese Herbal Medicine Drug Development (CDD) aims to improve pre-clinical and clinical Chinese Herbal Medicine (CHM) research, translating it into international pharmaceutical products. It focuses on developing treatments for ulcerative colitis and chronic constipation, supporting CHM-based start-ups targeting global markets, and nurturing CHM research talent in Hong Kong.

中藥創新研發中心有限公司
Centre for Chinese Herbal Medicine Drug Development Limited

INNOHK



Novel Chinese medicine for constipation CDD-2101

- Chronic constipation is affecting approximately 14% of the global population
- Based on the traditional Chinese herbal formulation “MaZiRenWan” (麻子仁丸)
- The first new botanical drug developed in Hong Kong that was authorised to conduct a clinical trial in the U.S.
- Phase I clinical trial commenced in the U.S. in May 2024

Novel Chinese medicine for treating myofibrillar myopathy CDD-2107

- Myofibrillar myopathy is a rare genetic neuromuscular disorder causing muscle weakness, atrophy, and other symptoms
- CDD-2107 was developed by using Chinese Herbal Medicine components and showed promising results in improving muscle strength, mobility and independence in clinical cases
- Granted orphan drug (a drug used for treating rare disease) designation by the U.S. FDA
- Plan to submit Investigational New Drug Application (IND) application to the U.S. FDA in two years

Novel Chinese medicine for ulcerative colitis remission CDD-2103

- Ulcerative colitis (UC) is a colonic disease, causing severe deterioration of life quality of the patients
- Pre-clinical studies have been completed and at submission stage for IND application from China National Medical Products Administration (NMPA) in May 2024

New therapeutic target for irritable bowel syndrome (IBS)

- Explored the therapeutic potential of targeting the phenethylamine/tryptamine/TAAR1 pathway for the treatment of IBS-D

More about CDD

LIFE SCIENCE IMAGING CENTRE

The Life Science Imaging Centre is equipped with state-of-the-art brain imaging facilities, including a 3T Magnetic Resonance Imaging (MRI) scanner, Electroencephalogram (EEG), functional Near-Infrared Spectroscopy (fNIRS), and Transcranial Magnetic Stimulation (TMS) system. These advanced technologies enable us to support academics from diverse disciplines in conducting impactful research projects that address a wide range of emerging global issues.

Leveraging the advanced facilities provided by our center, scholars at HKBU have undertaken a multitude of innovative and groundbreaking research projects. These projects encompass a wide range of topics, including the exploration of the neural architecture of leadership, the examination of the correlation between the human gut microbiome, food preferences, consumption, and brain activity, the investigation of collaborative inter-brain behaviours in music ensembles and the development of brain network strategies for modulating neurocognition and treating neuropsychiatric disorders. Through these studies, our scientists are pushing the boundaries of knowledge and making significant contributions to their respective fields.

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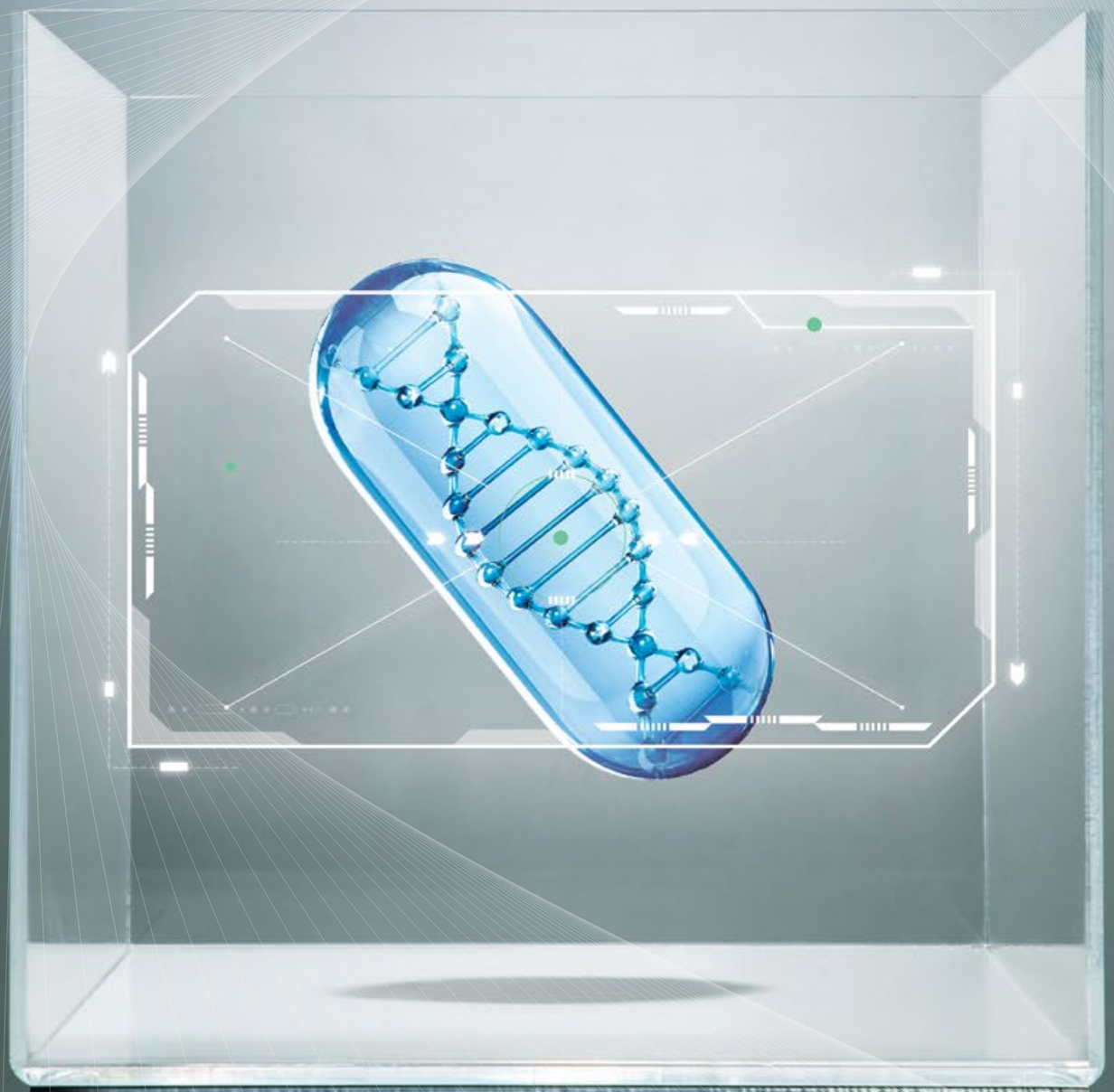
OUR INNOVATIVE ENDEAVOURS AND STARTUPS



Advancing New Drug Development and Healthcare through Research and Innovation

In our relentless pursuit of advancing healthcare, we have embarked on groundbreaking research endeavours that hold immense promise for the betterment of humanity. Through our cutting-edge technologies and innovative approaches, we are revolutionising the fields of Chinese medicine, cancer treatment, Alzheimer's Disease detection, tackling antimicrobial resistance, and many other areas of concern. These endeavours are poised to have profound global impacts.

As we continue to forge ahead in our research endeavours, we remain steadfast in our commitment to improving the lives of the global community. We are determined to make a lasting impact in healthcare, ushering into a future where diseases are more effectively treated and lives are transformed for the better.

NOVEL CHINESE MEDICINE FOR CONSTIPATION DEVELOPED BY HKBU AUTHORISED BY U.S. FDA FOR CLINICAL TRIAL

Centre for Chinese Herbal Medicine Drug Development (CDD) has achieved a significant milestone in the development of a novel Chinese medicine for treating chronic constipation. The CDD has received authorisation from the U.S. Food and Drug Administration (FDA) to conduct a phase I clinical trial of the new drug, marking the first time a Hong Kong-developed botanical drug has been authorised for a clinical trial in the U.S.

Chronic constipation affects approximately 14% of the global population and current treatments often have limited efficacy or undesirable side effects. In response to the need for better therapeutics, the CDD has developed a new drug called CDD-2101, based on previous pilot clinical studies and research on the traditional Chinese herbal formulation “MaZiRenWan.” The drug’s main ingredients include hemp seed, rhubarb, officinal magnolia bark, bitter apricot seed, bran stir-fried immature orange fruit, and white peony root.

Collaborating with partners such as the University of Chicago and the University of Macau, the HKBU research team submitted an Investigational New Drug Application for CDD-2101, complying with the requirements for botanical drug development set by the U.S. FDA. This authorisation to conduct a phase I clinical trial signifies a milestone in the standardisation and internationalisation of Chinese medicine.

The phase I clinical trial, scheduled in May 2024, evaluates the safety, tolerability, and pharmacokinetics profile of CDD-2101 on healthy individuals. It will be a randomised, double-blinded, and placebo-controlled study involving 20 participants in the U.S. The trial is conducting at a phase I clinical research center.

Following the completion of the phase I trial in 2024, a phase II study will collect safety and efficacy data from patients with chronic constipation. This will be followed by a large-scale phase III study to further evaluate the treatment efficacy and monitor any unforeseen side effects. The ultimate goal of the drug development program is to collect sufficient data for CDD-2101 to be evaluated and approved by the U.S. FDA as a new pharmaceutical for sale and marketing in the U.S.

Learn More

PROJECT TEAM

Professor Bian Zhaoxiang
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Ms Emily Au
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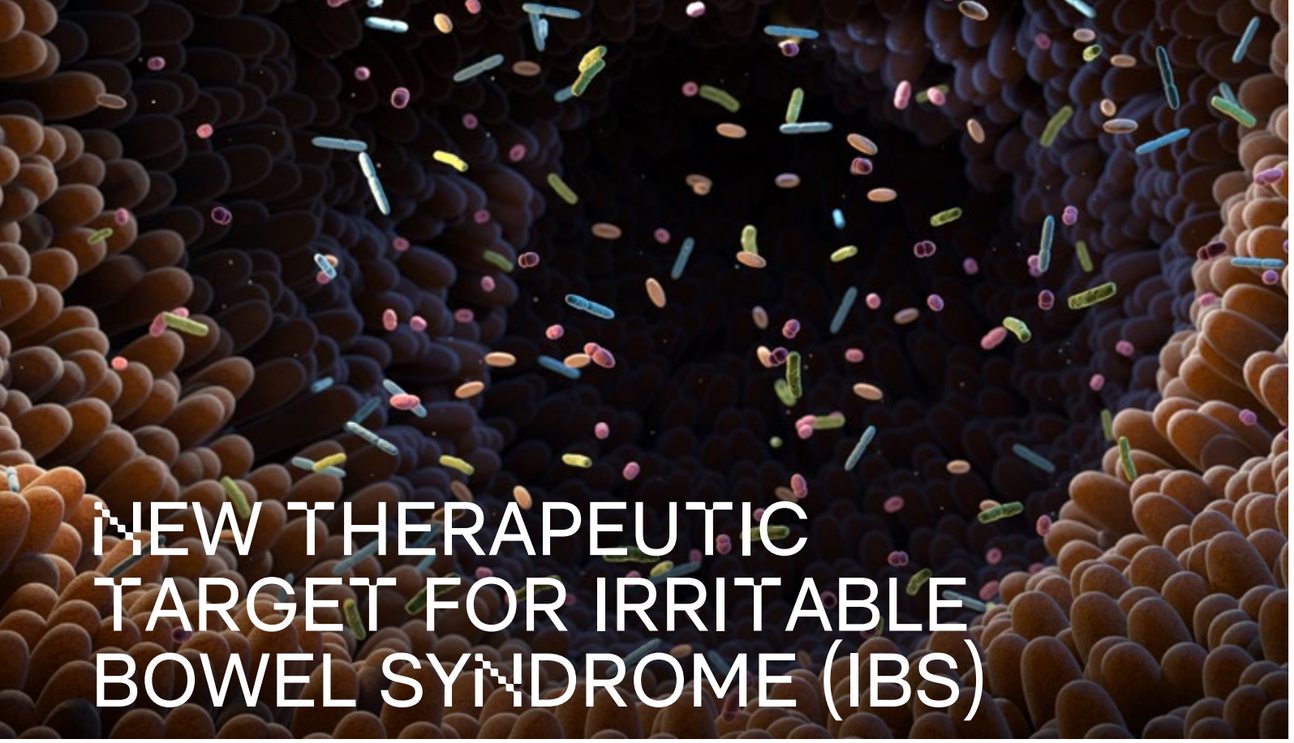
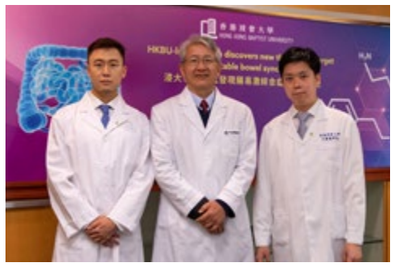


NEW THERAPEUTIC TARGET FOR IRRITABLE BOWEL SYNDROME (IBS)

Irritable bowel syndrome (IBS) is a common functional bowel disorder characterised by stool irregularities, abdominal discomfort and bloating. It has been estimated that about 7% of adults in Hong Kong are affected by IBS. IBS-D is the most common type of IBS and there is no known cure for the disease. Most clinical treatments for IBS-D focus on relieving symptoms.

Previous research has demonstrated that the increased production of serotonin, a key neurotransmitter involved in the regulation of gut motility, contributes to the gastrointestinal symptoms displayed in IBS-D. It has also been shown that gut microbiota play a role in regulating the levels of serotonin. However, the bacterial species concerned and the molecular mechanism by which the gut microbiota modulate serotonin production remain unclear. A research study has shown for the first time that the human gut bacterium *Ruminococcus gnavus* is a major trigger factor of diarrhoea-predominant irritable bowel syndrome (IBS-D). Based on this discovery, a new therapeutic target for the disease's treatment was identified. The study also found that low-protein food items such as fresh fruits, vegetables and bread may help reduce the gut motility in IBS-D.

The research findings have been published in the internationally renowned scientific journal Cell Host & Microbe.



PROJECT TEAM

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ANTI-CANCER COMBINATION DRUG DERIVED FROM CHINESE HERBS

PROJECT-IN-CHARGE

Professor Bian Zhaoxiang
Associate Vice-President (Clinical Chinese Medicine)

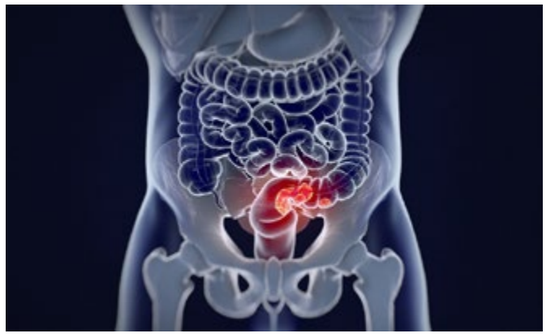
Director,
Centre for Chinese Herbal Medicine Drug Development

Learn More

Combination drug therapy is a promising strategy in modern anticancer research to combat drug resistance. By using different combinations of anticancer drugs, synergistic effects can be exhibited, leading to increased therapeutic efficacy. One such therapy is Halofuginone (HF) and Artemisinin (ATS), compounds extracted from Chinese herbs. In preliminary studies, the combination of HF and ATS showed inhibitory effects on different cancer cells, including colon, breast, liver, gastric, and skin cancer, with efficacy comparable or even higher than that of the current anti-cancer drug 5-Fluorouracil (5FU).

An animal study demonstrated that the HF-ATS drug combination could provide significant therapeutic effects on colon cancer without severe adverse effects. The multi-pronged effect of this therapy could increase therapeutic efficacy and lead to better outcomes for cancer patients. Combinational drug therapy offers a safer and more effective alternative to traditional chemotherapy. This approach has the potential to revolutionize cancer treatment and improve the lives of millions of patients worldwide.

NATURAL PRODUCT, DIHYDRO-RESVERATROL FOR TREATING COLORECTAL CANCER AND MELANOMA



PROJECT-IN-CHARGE

Professor Hongjie Zhang
Associate Dean (Teaching and Learning) of Chinese Medicine
Director and Professor, Teaching and Research Division
School of Chinese Medicine

5-Fluorouracil (5-FU) has been used for years as the primary treatment for colorectal cancer. However, it can cause side effects, such as increased risk of infection, easy bruising and bleeding, and anaemia. To address this issue, our technology proposes the use of dihydro-resveratrol (D-res) or its stilbenoid derivatives as a safer alternative. These drug-like molecules are derived from herbal constituents and have demonstrated a significant therapeutic effect on colorectal cancer without adverse effects.

Our experiments have shown that D-res is as effective as 5-FU in treating cancer but has much lower toxicity. In fact, D-res is an experimentally proven antitumor agent that can be safely prescribed to cancer patients even at higher doses than 5-FU. Furthermore, D-res and its derivatives can be synthesized from Resveratrol, a natural plant compound, and developed as food dietary compounds for preventing and treating cancers. Overall, our technology offers a promising solution to the side effects of chemotherapy and the need for safer and more effective cancer treatments.

Learn More

NOVEL ANTI-MICROBIAL AGENT FOR PREVENTING DENTAL CARIES

Maintaining good oral hygiene is crucial in preventing severe dental caries, which can impair one's quality of life. However, we understand that some parents may struggle to get their little ones to brush their teeth or find it difficult to clean between teeth with dental floss or toothpicks. We are excited to introduce a new and innovative solution that can help prevent the formation of biofilm and inhibit the growth of harmful bacteria.

Our new compounds, dihydro-resveratrol or its derivatives, are herbal extracts that are cost-effective and safe to use. Unlike chemical-based products, our compounds have fewer harmful effects, making them an excellent option for small children, older adults, or people with severe disabilities. These compounds can be used in various forms such as toothpaste, oral gel, toothbrush sanitiser, mouthwash, or chewing gum.

PROJECT-IN-CHARGE

Professor Hongjie Zhang
Associate Dean (Teaching and Learning) of Chinese Medicine;
Director and Professor, Teaching and Research Division
School of Chinese Medicine

Learn More

A MODIFIED CHINESE MEDICINE FORMULATION FOR TREATING ALZHEIMER'S DISEASE

Alzheimer's disease (AD) is a major global challenge that adversely affects patients' quality of life and poses a significant burden on their families, the medical system, and the economy. While prescription drugs like Aricept®, Exelon®, Razadyne®, and Namenda® can help reduce or delay some symptoms, they cannot cure AD and have side effects ranging from mild to severe.

To address this issue, we have developed a patented formulation by modifying a Traditional Chinese Medicine (TCM) formulation, Huang-Lian-Jie-Du-Tang (HLJDT, 黃連解毒湯). Our research findings show that the modified HLJDT (HLJDT-M) can reduce the accumulation of protein plaques and fibrous nodules in the brain that lead to the rapid death of neurons and deterioration of brain function.

HLJDT-M is a low-cost and low-side-effect alternative to prescription drugs for treating AD. It has demonstrated more significant therapeutic and pharmacological effects in our experiments. Our technology offers a promising solution to the challenges of AD and has the potential to improve the lives of patients and their families.

PROJECT TEAM

Professor Li Min
Executive Associate Dean of Chinese Medicine;
Ma Pak Leung Endowed Professor
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Professor, Teaching and Research Division
School of Chinese Medicine

Dr Iyaswamy Ashok
Research Assistant Professor,
School of Chinese Medicine

Learn More

NOVEL DRUG DELIVERY SYSTEM FOR GOUTENG COMPOUND FOR ALZHEIMER'S DISEASE TREATMENT

Prof Li's research team have made significant strides in the field of drug delivery for Alzheimer's disease (AD) by engineering exosomes, extracellular vesicles released by cells. This innovative approach aims to effectively transport the bioactive compound Corynoxine-B, derived from the Chinese herbal medicine Gouteng, to the brains of mice with AD. The goal is to improve cognitive function and reduce AD symptoms by inducing autophagy, a cellular process crucial for maintaining neuronal health.

By overexpressing an adaptor protein Fe65 on the surface of exosomers released from neuronal cells, these engineered exosomes exhibited a notable migratory capacity towards neuronal cells. Fe65 is involved in the processing of amyloid-beta precursor protein (APP), which plays a crucial role in the development of AD.

To assess the therapeutic potential of this system, Corynoxine-B, a bioactive compound, was loaded into the engineered exosomes and administered to mice with AD. The results revealed that the engineered exosomes effectively induced autophagy in mice. Furthermore, these exosomes demonstrated the ability to traverse the blood-brain barrier and successfully deliver Corynoxine-B to the brain. This targeted delivery approach led to a significant 30% reduction in the accumulation of amyloid-beta protein, a hallmark of AD pathology.

PROJECT TEAM

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Dr Iyaswamy Ashok
Research Assistant Professor,
School of Chinese Medicine

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MICROFLOW INNOVATION LIMITED

A HKBU Startup

MicroFlow

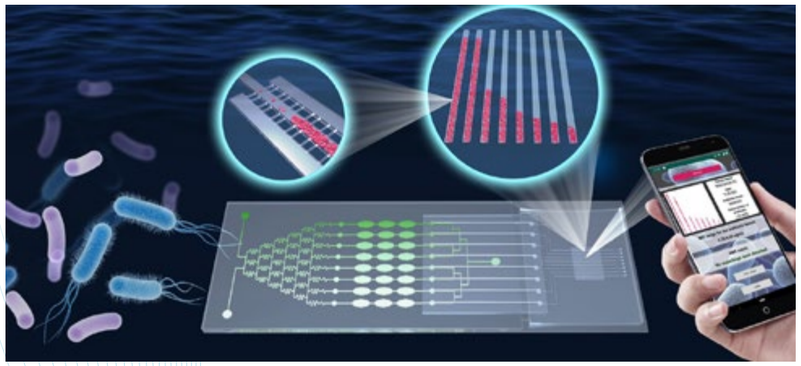
Rapidly detecting drug-resistant bacteria: A game-changing microfluidic system for on-site testing in resource-limited settings

PROJECT-IN-CHARGE

Dr Kangning Ren
Associate Professor,
Department of Chemistry

Researchers have developed a microfluidic system that is capable of detecting drug-resistant pathogens within 3 hours, even in resource-limited settings. This Antimicrobial Susceptibility Testing (AST) system is designed to provide a sample-to-answer solution that can be used on-site. The technology is based on a unique “barcode” cell sensor that uses an adaptive linear filter array to count very small volumes of cells. This method is fully automatic and does not require a microscope. Suspended cells are concentrated into visible microbars, whose length is proportional to the number of cells. The results can be easily captured and analysed using a cell phone.

This patented technology can process large numbers of samples quickly and provide initial screening results for drug-resistant pathogens. The system is affordable, portable, high-throughput, and user-friendly, making it a promising tool in the fight against antimicrobial resistance. It has the potential to be used on a large scale in resource-limited situations, such as frequent safety screenings of water, food, and public facilities. Additionally, it can be used for urgent surveys of massive samples during an infectious disease outbreak, particularly in developing countries.



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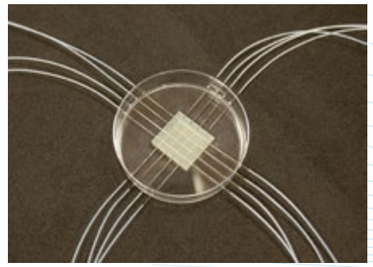
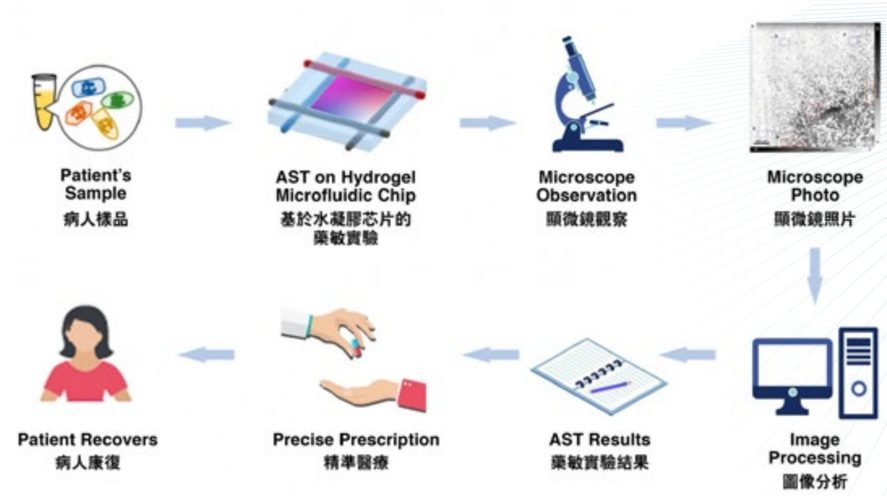
MULTI-DIMENSIONAL ANTIMICROBIAL RESISTANCE TESTING SYSTEM

Hydrogel microfluidic chip enables precise drug analysis with multiple variables

Dr Ren’s team has successfully developed the world’s first multidimensional Antimicrobial Susceptibility Testing (AST) system. This revolutionary technology is capable of providing precise information regarding drug-resistant pathogens present in patients, consequently enabling physicians to accurately determine the most effective dosage of antibiotics required for efficient treatment. The newly developed system is fully automated, and its efficacy is 10-20 times higher than the currently available AST methods. Moreover, it is remarkably cost-effective, making it an efficient and affordable alternative to the existing AST systems that are only accessible in professional medical laboratories. This development is expected to revolutionise the field of diagnosis by providing physicians with accurate prescriptions, thereby significantly reducing the chances of antibiotic abuse or misuse.





PROJECT-IN-CHARGE

Dr Kangning Ren
Associate Professor,
Department of Chemistry

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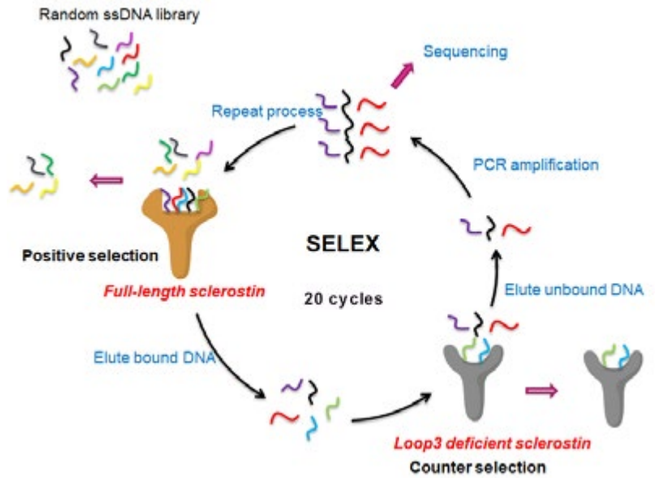
AN APTAMER DRUG TARGETING SCLEROSTIN LOOP3 FOR BONE ANABOLIC THERAPY WITHOUT INCREASING CARDIOVASCULAR RISK

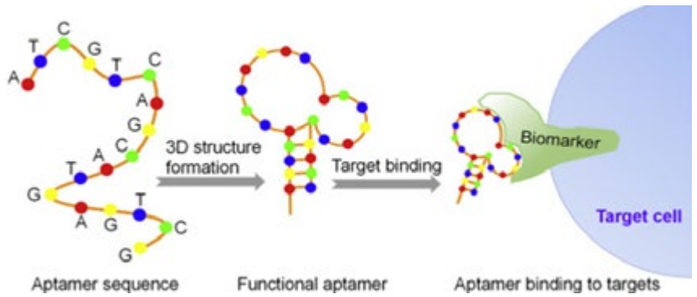
Osteoporosis is a metabolic disease that causes a reduction in bone density. The use of therapeutic antibodies against sclerostin has shown promise in promoting bone formation and reducing the risk of fracture for postmenopausal osteoporosis patients. However, due to potential cardiovascular risks, a black box warning is required by both the U.S. Food and Drug Administration (FDA) and European Medicines Agency (EMA). Our genetic research has revealed that sclerostin loop3 plays a crucial role in inhibiting bone formation but not in protecting the cardiovascular system. To address this issue, our research team has designed and synthesised a specific aptamer targeting sclerostin loop3, which we named Apc001. Apc001 effectively inhibits sclerostin's antagonistic effect on the Wnt signaling pathway, thereby promoting bone formation in animal models of osteoporosis. Importantly, the application of Apc001 does not increase the risk of developing cardiovascular diseases such as aortic aneurysms and atherosclerosis.

PROJECT-IN-CHARGE

Professor Zhang Ge
Associate Dean (Research) of Chinese Medicine;
Director, Technology Development Division;
Professor, Teaching and Research Division
School of Chinese Medicine

We are proud to announce that the U.S. FDA has granted Orphan Drug and Rare Pediatric Disease Designations to Apc001 for the treatment of osteogenesis imperfecta (OI). These designations reflect the potential of Apc001 to address an unmet medical need for patients suffering from this rare and debilitating disease. HKBU also lead an initiative that supports space missions by developing a novel aptamer drug for alleviating microgravity-induced bone loss in astronauts during deep space exploration.





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GIHON BIOTECH LIMITED

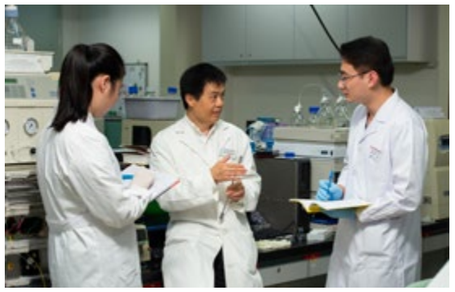
Unveiling the power of *Dendrobium*: Revolutionary skin whitening and protection through DR2 stilbene compounds

A HKBU Startup

Exposure to ultraviolet (UV) rays from sunlight triggers the production of reactive oxygen species (ROS) and free radicals, resulting in skin darkening. While melanocytes generate melanin to protect the skin from oxidative stress, excessive melanin accumulation can cause pigmentation issues. However, our research has shown that DR2-type stilbene compounds possess remarkable properties in reducing oxidative stress, inhibiting melanin production by suppressing tyrosinase activity and related protein expression in melanocytes. Notably, plants of the *Dendrobium* genus, particularly *Dendrobium officinale* and *Dendrobium nobile*, contain a high concentration of DR2-type stilbene compounds.

These natural compounds derived from *Dendrobium* have demonstrated significant efficacy in improving skin conditions, making them highly relevant for the development of medical cosmetics focused on skin whitening and protection. Leveraging the active ingredients of *Dendrobium* DR2-type stilbene compounds, we have successfully formulated products that offer both skin protection and whitening effects.

To further enhance the melanin inhibitory effect of DR2, we have synthesized multiple new derivatives by introducing lipophilic functional groups that improve skin absorption. Through comparative analysis, we have found that DR10, among these synthetic derivatives, exhibits superior anti-melanin activity across multiple cell types. In fact, DR10 displays the most potent inhibitory effect on cellular melanin production when compared to other stilbene compounds. Importantly, we have observed no significant cytotoxicity even at the highest tested concentration of DR10.



PROJECT-IN-CHARGE

Professor Hongjie Zhang
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Director and Professor, Teaching and Research Division
School of Chinese Medicine

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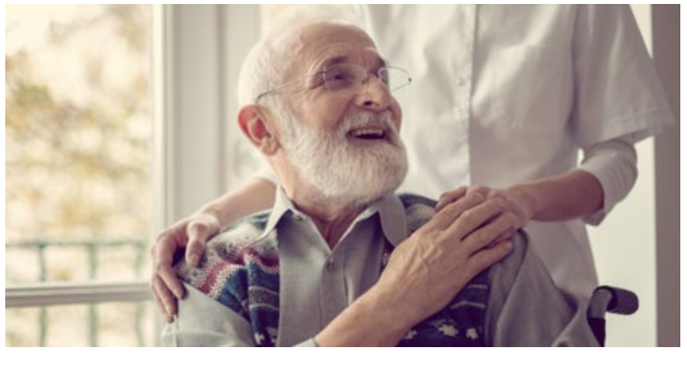
MIND AND TECH LIMITED

Revolutionising Alzheimer's diagnosis: Innovative nanotechnology for accurate and non-invasive detection



A HKBU Startup

Alzheimer's disease (AD) is the most common form of neurodegenerative dementia, currently affecting 50 million of people worldwide. There is no single clinical test can provide a confirmative diagnosis of AD presently. Several biomarkers in cerebrospinal fluid (CSF) have been recognised and established for AD diagnosis with high diagnostic accuracy over 85%. However, the collection of CSF is invasive and causes discomfort and side effect on patients. On the other hand, the collection of urine and saliva is relatively simple and non-invasive.

Our technology provides a solution for early Alzheimer's disease diagnosis by using magnetic nanoprobe for sensitive detection of the target biomarker in different body fluids including blood serum, saliva and urine. In addition, our detection assay has a wide dynamic range that allows the quantification of biomarkers in a minute amount (a few microliters) of samples. It is proven practically useful for different body fluids. It is a non-invasive, rapid and cost-effective alternative for accurate diagnosis of AD.

MIND and Tech Ltd. was set up aiming to develop a cost-effective, simple, direct yet sensitive platform for early neurodegenerative disease detection and diagnostics.

PROJECT-IN-CHARGE

Professor Ricky M. S. Wong
Professor,
Department of Chemistry

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AN AUTOMATED MULTIPLEX PATHOGEN DIAGNOSTIC SYSTEM

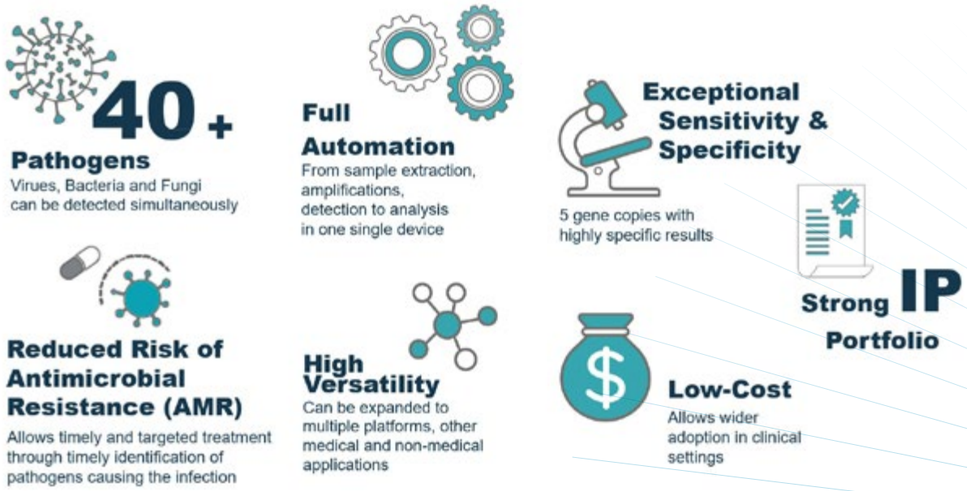
Research team led by Prof. Lau has developed a revolutionary automated multiplex diagnostic system that offers a fully automated solution from sample extraction to result. The system is capable of detecting over 40+ pathogens, including viruses, bacteria, and fungi, in approximately an hour.

One of the key features of the system is the respiratory pathogen panel, which covers 40+ different pathogens. It has been fully evaluated and has demonstrated an extremely high level of sensitivity and specificity. Furthermore, the system is remarkably cost-effective, making it a highly accessible option for a wide range of applications. Also, the system is highly versatile, and can be custom-made to detect other targets, such as cancer markers or other DNA/RNA targets. It can detect up to 480 targets in a single run, offering unparalleled efficiency and convenience. We believe that the system has the potential to transform the field of diagnostics, and we envision several potential applications for it. These include point-of-care diagnostics, clinical and drug research, biologic QA/QC, immuno-therapy QA/QC and theragnostic.

PROJECT-IN-CHARGE

Professor Terence LT Lau
Interim Chief Innovation Officer

Honorary Professor,
School of Chinese Medicine



Ideal cost-effective routine testing for valuable Chinese Medicine authentication

A HKBU Startup

香港名貴中藥檢定中心
HK Authentication Centre of Valuable Chinese Medicines

With the increasing popularity of traditional Chinese Medicine (TCM), the authentication and quality analysis of valuable Chinese medicines like Tiepi Shihu, Cordyceps, Edible Bird's Nest (EBN), and Ejiao have become crucial to ensure their safety and efficacy.

These valuable CM products are traditionally used for toning purposes. However, the presence of numerous counterfeit products poses significant health risks to consumers.

Current authentication methods for valuable CM are complicated and time-consuming, requiring the expertise of botanical experts. Even with DNA technology, it is unable to distinguish the specific medicinal parts of the genuine species. To address this problem, innovative patented technologies have been developed, which targeting unique polysaccharide and oligomer markers for authentication and quality control purposes. By high-performance gel permeation chromatography (HPGPC) and mass spectrometry (MS), researchers have identified unique markers for each valuable CM.

These technologies offer new detection methods which are highly specific, efficient, and cost-effective. These methods are suitable for large-scale detection by enterprises due to high throughput detection. They help prevent the occurrence of counterfeit and adulterated products, ensuring the safety and efficacy of TCM products.

PROJECT-IN-CHARGE

Professor Simon Han
Professor, Teaching and Research Division
School of Chinese Medicine

Associate Director (Research),
Research Centre for Standardization of Chinese Medicines

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