

FOOD TECH AT HKBU

Translating Innovation &
Creativity for Impact

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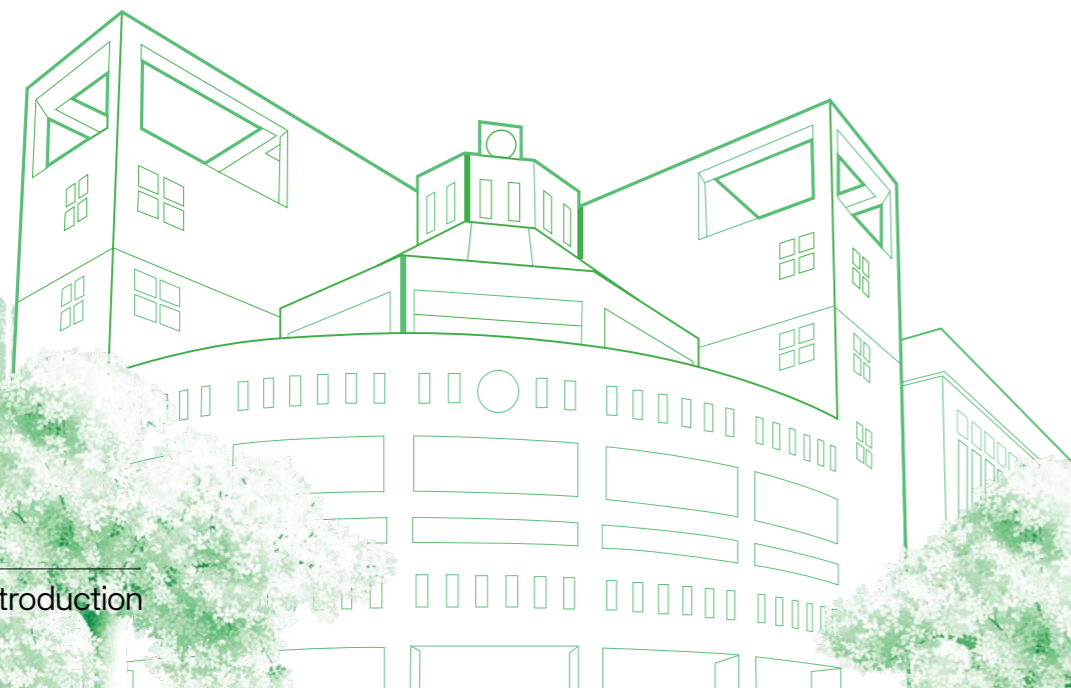
FOOD TECH

innovates for a better tomorrow and leads the society to a safer, healthier, and more sustainable future.

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

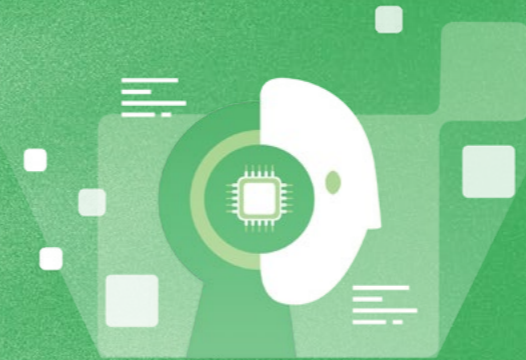
Art, Culture and Creative Media

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



TRANSLATING INNOVATION & CREATIVITY FOR IMPACT

The Institute for Innovation and Translation (IIT)

at HKBU is dedicated to driving innovations, research and development, technology translation, and applications to enable HKBU to respond to emerging challenges and opportunities at the global and national levels, and under the aegis of the Hong Kong Special Administrative Region of the People's Republic of China (HKSAR), where innovation and technology development remain a top policy priority.

We strive to bridge the gap in technology readiness between academic innovation and industry applications for the well-being of society.

IIT comprises

Innovation and Entrepreneurship

Technology Translation

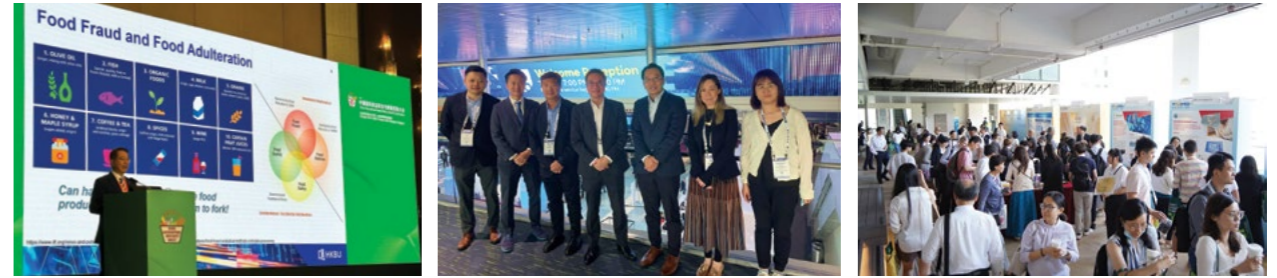
each being instrumental in fostering a vibrant ecosystem at HKBU conducive to technology translation and collaborations.

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, IIT 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.



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

TECHNOLOGY TRANSLATION

Anchoring Technology Application

IIT 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 (WJY ITCMR)

Located at the Hong Kong Science Park, the primary mission of WJY ITCMR is to become a recognised world-class centre for innovative research in Chinese medicine. Equipped with state-of-the-art research infrastructure, WJY 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.



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.

02

PLATFORM AND INFRASTRUCTURE



NGO observer
CODEX ALIMENTARIUS
INTERNATIONAL FOOD STANDARDS

An affiliate of
International Association for
Food Protection

Powering Food Safety & Quality with Science & Technology

Food Safety Consortium (FSC) is a charitable organisation in Hong Kong aiming to address food safety challenges with cutting-edge and applied technology and with timely and in-depth communication on food safety related matters. FSC comprises stakeholders from academia, industry and other organisations and is currently home to over 70 corporate members. FSC is supported by Hong Kong Baptist University's Institute for Innovation and Translation, HKBU academic units and research centres.



Objectives

- To create stakeholder network in food safety and quality
- To provide support to global community with advanced technology and science
- To enhance capability and competence on food safety & quality and related technology developments through university, industry and government collaborations

Our Strengths & Scope

- Food as Medicine
- Innovative technology development
- Functional food development
- Nutrition and public health
- Testing and certification
- Risk Analysis and toxicology
- Food virus testing
- Genetically modified animal and plant testing
- Food authentication
- Application of QA/QC systems
- Novel biological, chemical and physical testing technologies
- Professional education training, and consultancy services



70+ CORPORATE MEMBERS

in the fields of Manufacturing, Catering, Food Security Management, Retail & Wholesale, Testing Services, and others



Global Engagement and Recognitions

FSC actively engages with regional, national, and supranational bodies to promote Hong Kong's capabilities and efforts in various areas of food tech. Through relentless efforts in engaging with representative agencies in food safety, such as the Food and Agriculture Organization of the United Nations, WHO/FAO INFOSAN, the China National Center for Food Safety Risk Assessment, Chinese Academy of Agricultural Sciences, Interpol, DG Sante, European Institute of Innovation and Technology (EIT), and the European Food Safety Authority (EFSA), FSC aims to showcase Hong Kong's competence in innovation on a global platform and facilitate collaboration in different fields of food safety, including food authenticity, food fraud, genome sequencing, food safety applications, and antimicrobial resistance.

World Food Safety Day and Senior Advisory for United Nations Project

FSC participated in the inaugural meeting of World Food Safety Day (WFSD) held at the United Nations Headquarters in New York to share the importance of interdisciplinary research driven by academia to address emerging food safety challenges.

Professor Terence Lau, Chairman of FSC, was appointed by United Nations Office for Project Services (UNOPS) as Senior Advisor to facilitate the development of the Asia-Pacific Smart Agricultural and Food Safety Industrial Demonstration Zone, which aimed to enhance capacity-building, promotion, and facilitation of public-private partnerships in Changchun, Chinese Mainland.



IAFP Recognition and FAO/WHO Codex Alimentarius NGO Observer

FSC is the Hong Kong affiliate of the International Association for Food Protection (IAFP), a century-old food association in the United States with over 4,500 food safety professionals from more than 50 countries.

FSC's effort and contribution towards promoting food safety globally has been consistently recognised by the International Association for Food Protection (IAFP). In 2017, FSC became the first affiliate outside of the Americas to receive the "C.B. Shogren Memorial Award," followed by the "Affiliate Communication Award" in 2019 for outstanding outreach and engagement. Most recently, in 2025, FSC was honoured with the "Best Overall Affiliate Meeting Award," celebrating its leadership in hosting a dynamic and comprehensive conference. These awards reflect FSC's enduring commitment to advancing food safety worldwide.



Under the Joint Food Standards Programme of the Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO), the Codex Alimentarius Commission (Codex) was established by FAO/WHO with an aim to develop an international food standard. FSC was the first non-governmental organisation (NGO) from Hong Kong and Chinese Mainland to obtain the Observer status at Codex. Such status creates the channel for sharing concerns and suggestions from FSC, and its members, at supranational level over the standard formulation process of Codex.

Learn More



BEIJING NORMAL-HONG KONG BAPTIST UNIVERSITY (BNBU)

Situated in Zhuhai city of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), Beijing Normal-Hong Kong Baptist University (BNBU) was established as a collaborative effort between Beijing Normal University (BNU) and Hong Kong Baptist University – the first full-scale cooperation in higher education between the Chinese Mainland and Hong Kong.

BNBU places great emphasis in promoting collaboration between academia and industry as well as facilitating the translation of research achievements. With invaluable research platforms like the Guangdong Provincial Key Laboratory of Data Science and Technology Cross-Application, BNBU harnesses innovative resources from the GBA to drive forward scientific research that is forward-thinking.



Within the BNBU Department of Life Sciences, the **Food Science and Technology Programme** is offered, which aims to cultivate talents for the food safety industry. This programme encompasses six research major subjects:

Biotechnology & food safety

Health promotion effect of bioactive dietary components

Nutrition & health

Food processing, flavour chemistry & sensory science

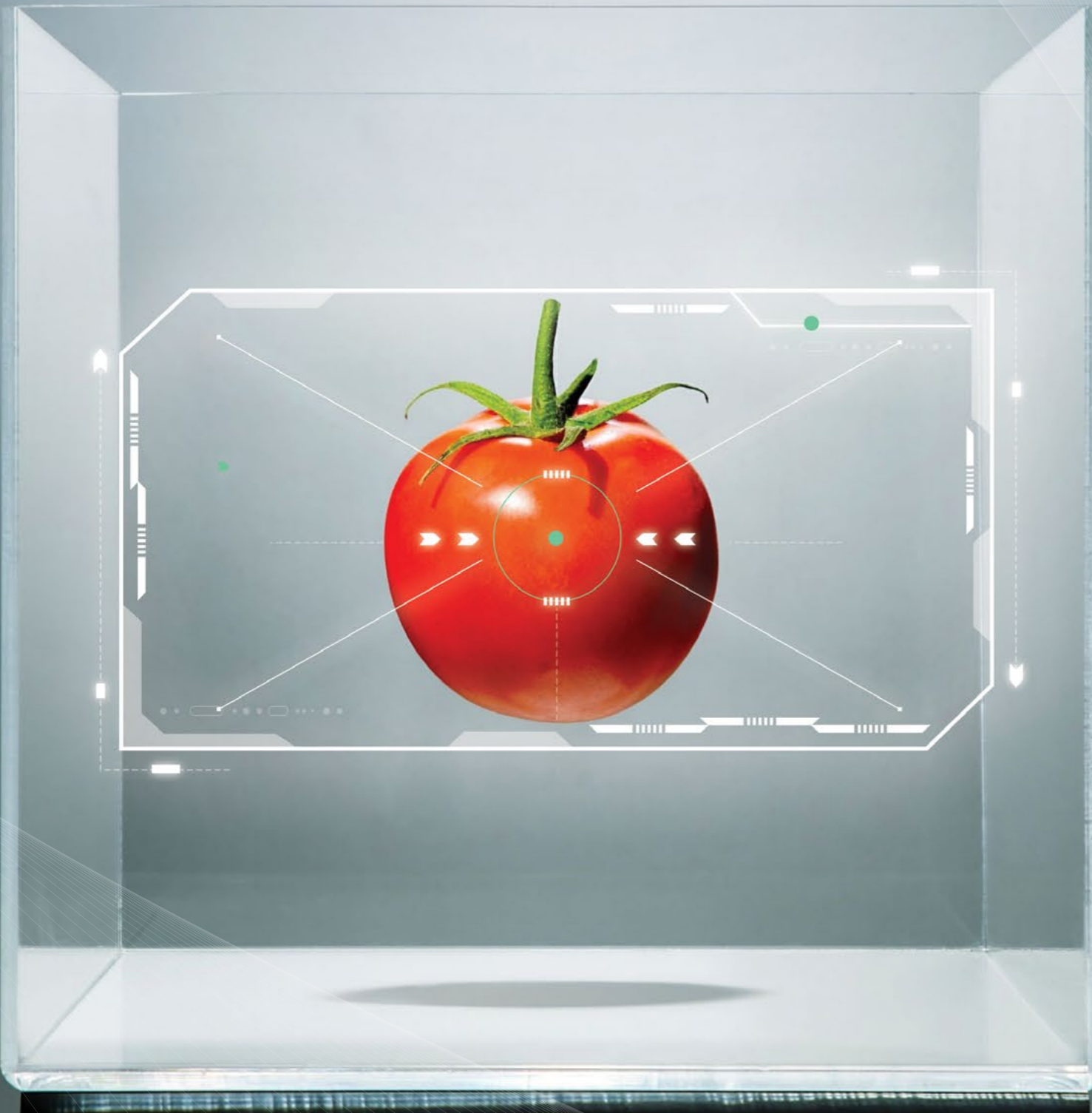
Biomedical materials & targeted drug delivery

Food packing innovation

This four-year programme is designed to nurture graduates who possess comprehensive knowledge and competence in addressing issues related to the production, marketing, and management of food and nutritional science. The programme seeks to equip students with the skills and expertise necessary to become food scientists, technologists, regulatory specialists, and professionals in the field of food science.



OUR INNOVATIVE ENDEAVOURS AND START-UPS



Transcending Traditions, Driving Innovation: HKBU's Interdisciplinary Approach to Food Tech

HKBU recognises the immense potential of food tech in addressing global challenges such as public health, food safety, food authentication, antimicrobial resistance, sustainable development, and food security. To nurture the development of food tech and optimise research impact, HKBU embraces an interdisciplinary approach that transcends traditional disciplinary boundaries by integrating various fields such as biology, chemistry, physics, engineering, computing, and artificial intelligence.

“ If it’s not safe, it’s not food. ”

FAO, United Nations

Good food is fundamental to good health, and HKBU strives to generate health benefits for the public. Leveraging the established strengths and advantages of our School of Chinese Medicine, HKBU explores the concept of “Food as Medicine” to encourage a wider application and integration of Chinese medicine and food safety. This will in turn contribute to the internationalisation and standardisation of Chinese medicine.

HKBU strengthens its research, education, and innovation efforts and maximises their impact on the community by collaborating with industry stakeholders, government agencies, and non-profit organisations. These public-private partnerships facilitate the translation of research findings into practical applications and ensure that the benefits of food tech advancements could reach a wider community.

Technology Readiness Level (TRL)



GINSENG'S POTENTIAL TO ADDRESS HIGH-FAT-DIET-INDUCED OBESITY

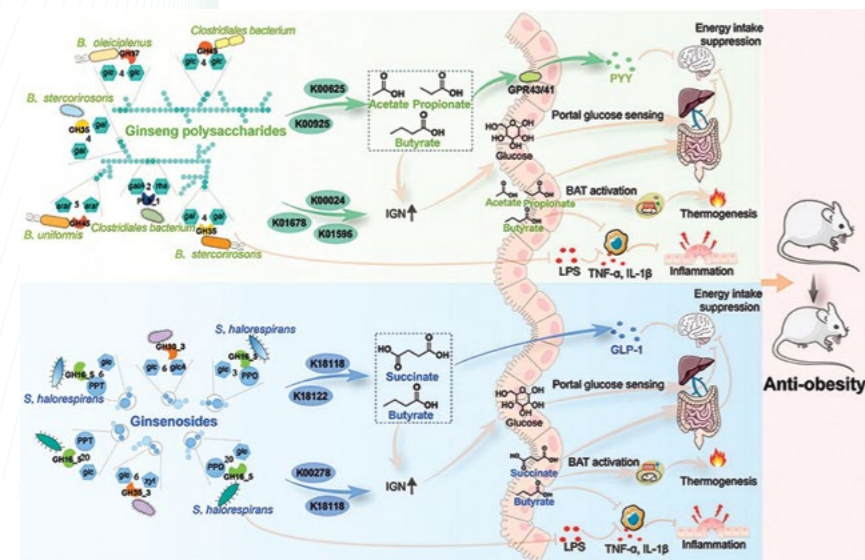
Key Highlights

This project shows that ginseng polysaccharides (GP) and ginsenosides (GS) prevent obesity in high-fat diet-fed mice by promoting specific gut bacteria and activating metabolic pathways, providing new insight for microbiota-targeted, ginseng-based obesity therapies.

Project Summary

Led by HKBU health scientist Professor Xu, the team collaborates with Tianjin Medical University and Nanjing University of Chinese Medicine to investigate how GP and GS, the principal bioactive compounds in ginseng, combat high-fat diet-induced obesity by modulating gut microbiota. In recent decades, research has increasingly recognised that gut microbiota dysbiosis functions almost like a pathogen in the onset and progression of obesity, with specific microbial species playing key roles in either preventing, causing, or treating the disease.

This research showed that GP and GS selectively enhance the growth of beneficial gut bacteria with specific carbohydrate-active enzymes, activating metabolic pathways such as short-chain fatty acid (SCFA) and intestinal gluconeogenesis. These processes, in turn, stimulate SFCA-glucagon-like peptide-1/ Peptide YY signalling and intestinal gluconeogenesis, leading to reduced adiposity and improvement in metabolic health. The study also identifies the distinct bacterial species and enzymes responsible for metabolising GP and GS, offering detailed insight into ginseng's anti-obesity effects and paving the way for developing ginseng-based obesity treatment.



Access Publication



PROJECT-IN-CHARGE

Professor Jun Xu
Assistant Professor,
Teaching and Research Division,
School of Chinese Medicine

Associate Director,
Research Centre for Standardization
of Chinese Medicines

Technology Readiness Level (TRL)

5-6

Technology Demonstration



DISCOVERY OF NOVEL GENES FOR THE BIOSYNTHESIS OF VALUABLE MONOTERPENES THYMOL, CARVACROL AND THYMOHYDROQUINONE FROM CULINARY HERBS

Key Highlights

This project seeks to identify and characterise the enzymes and unique biosynthetic pathway for thymol, carvacrol, and thymohydroquinone in the Lamiaceae family. The findings enable metabolic engineering for large-scale production, bringing benefits to medicine, nutrition, aromatherapy, and various industrial applications.

Project Summary

The research identified and characterised enzymes involved in thymol, carvacrol, and thymohydroquinone biosynthesis in the Lamiaceae family. It determined a unique pathway that commences with the formation of γ -terpinene from geranyl diphosphate. The entire pathway was successfully reconstituted in tobacco, thereby validating the work's experimental model.

Thymol and carvacrol, long esteemed for their aroma, flavour, exhibit antibacterial and anti-spasmodic properties and are precursors to thymohydroquinone. Thymohydroquinone is a substance with anti-inflammatory, antioxidant and anti-tumour activities. Understanding the biosynthesis of these phenolic monoterpenes enriches biochemical knowledge and opens new opportunities.

The findings can be applied in metabolic engineering to produce high-value terpenes in plants and microorganisms. Given the diverse therapeutic activities, large-scale biosynthesis could greatly benefit medicine, nutrition and aromatherapy. By demonstrating a novel mechanism for the formation of phenolic monoterpenes contrary to previous predictions, the research enhances techniques for creating these metabolites, with potentials for further industrial application.

Access Publication



PROJECT-IN-CHARGE

Professor Pan Liao
Assistant Professor,
Department of Biology

Technology Readiness Level (TRL)

3-5

Technology Development

SUSTAINABLE, SCALABLE PRODUCTION OF SAUSSUREA INVOLUCRATA EXOSOME-LIKE NANOPARTICLES FOR IMMUNE-HEALTH FUNCTIONAL FOODS

Key Highlights

The booming functional food market needs safe, effective immune boosters. Dr. Chen and her team pioneer sustainable production of *Saussurea involucrata* (snow lotus) exosome-like nanoparticles (ELNs) via plant stem cell culture, avoiding endangered wild harvest. These nano-carriers are rich in actives, highly bioavailable, and quality-controlled, offering first-in-class, clinically promising, commercially scalable ingredients for immune health.



Fig1. Conceptual diagram of this study

Project Summary

Saussurea involucrata (herbal original of a traditional Chinese Medicine “snow lotus”) is prized for immune support, yet wild resources are endangered. We build a scalable plant stem cell suspension platform to sustainably produce exosome-like nanoparticles (ELNs), which are nano-vesicles enriched with small RNAs, proteins, and metabolites, delivering standardised, high-bioavailability ingredients for functional foods without wild harvesting.

In this project, researchers have optimised ELN isolation (differential centrifugation), and established comprehensive characterisation: morphology (TEM), size/concentration (NTA), and vesicle markers (CD63/CD81). A robust quality system evaluates batch consistency, storage stability, and safety. Immune-modulating activities are validated in cells and mouse models, while metabolomic/miRNA/proteomic profiling and network analyses pinpoint active components and mechanisms.

The deliverables include a GMP-translatable manufacturing process, release specifications, and preclinical evidence to support regulatory readiness. This pioneer approach modernizes TCM, conserves endangered resources, and creates commercially scalable, immune-health ELN ingredients with clear clinical and market potential.

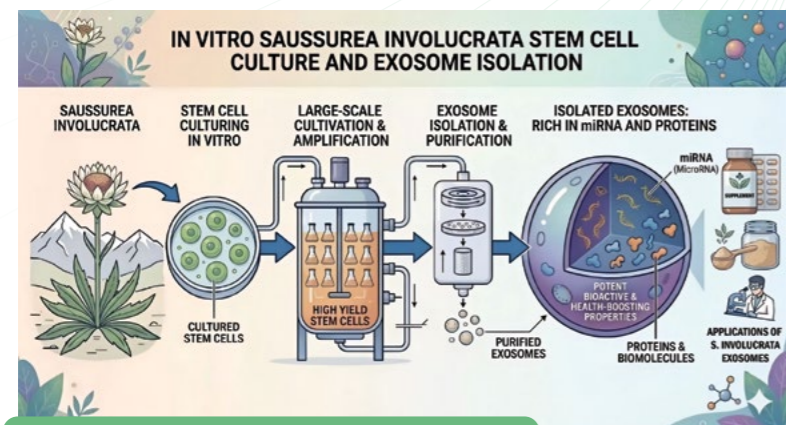
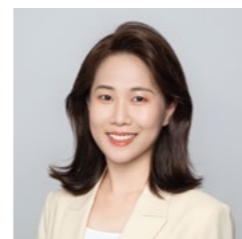


Fig2. Schematic diagram of *S. involucrata* stem cell culture and exosome isolation.



PROJECT-IN-CHARGE

Dr. Qilei Chen
Research Assistant Professor,
Teaching and Research Division,
School of Chinese Medicine

Technology Readiness Level (TRL)

Technology Development

3-5

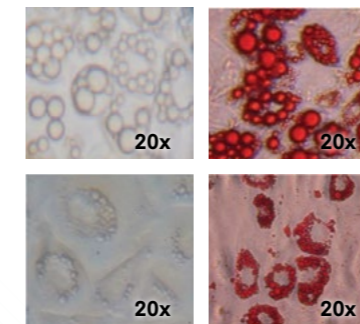
FOOD AS MEDICINE: CINNAMON AND APIGENIN FOR OBESITY PREVENTION

Key Highlights

Cinnamon extract and apigenin, two natural food-derived compounds, show promising anti-obesity effects through distinct mechanisms. Cinnamon extract promotes the browning of fat cells and enhances thermogenesis, while apigenin reduces visceral fat by disrupting fat cell formation pathways. These findings highlight the promise of “food as medicine” in combating obesity.



Project Summary

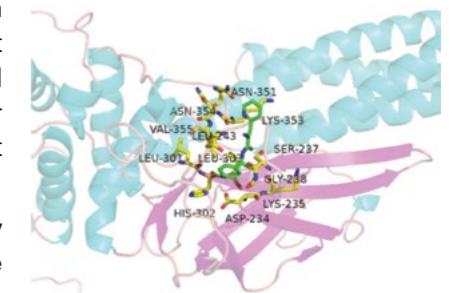


Obesity is a major global health concern linked to numerous diseases, placing substantial burdens on healthcare systems. Food science is exploring the bioactive compounds of everyday foods as innovative solutions for obesity management. Cinnamon, a widely used spice, is valued for its flavour and antioxidant and metabolic benefits. Apigenin, a natural flavonoid abundant in fruits, vegetables, and herbs, is emerging as a nutritional ingredient with targeted anti-obesity effects.

Researchers investigated the impact of cinnamon extract (CE) on fat cells, specifically its ability to promote browning of white adipocytes, a cellular transformation that enables energy consumption in fat cells. Advanced analysis in both cell and animal models revealed that CE increased levels of uncoupling protein 1, a key molecule in the thermogenic, calorie-burning activity of brown fat leading to reduced body weight in obese mice. These findings highlight the potential of cinnamon as a natural, non-toxic remedy leveraging the latest scientific techniques to combat obesity.

Another study focused on apigenin's effects on visceral obesity visceral fat. The project team discovered that apigenin supplementation significantly reduced body weight and visceral adipose by inhibiting fat cell formation and differentiation. Mechanistically, apigenin suppressed the signal transducer and activator of transcription 3 (STAT 3)/ cluster of differentiation 36 (CD36) signalling axis, disrupting the cascade that leads to visceral fat accumulation.

These results provide scientific evidence for the potential of dietary apigenin as a therapeutic agent against visceral obesity, highlighting the “food as medicine” approach in which specific natural molecules from our diet directly influence metabolic health through targeted biochemical mechanisms.



Access Publication



PROJECT-IN-CHARGE

Professor Hiu Yee Kwan
Associate Professor, Director,
Teaching and Research Division,
School of Chinese Medicine

Vincent V. C. Woo Endowed
Associate Professor in
Chinese Medicine,
Office of the Dean of Chinese
Medicine

Technology Readiness Level (TRL)

Feasibility Research

2-3

MACROPHAGES CARRYING TRIPTOLIDE FOR TARGETED TREATMENT OF RHEUMATOID ARTHRITIS

Key Highlights

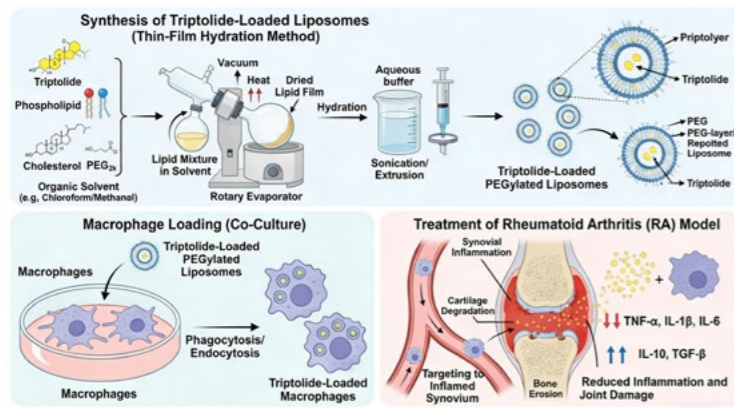
Triptolide, a potent anti-inflammatory from *Tripterygium wilfordii*, helps fight rheumatoid arthritis (RA) but suffers from low bioavailability and toxicity. The research team engineer anti-inflammatory M2 macrophages as living carriers that home to inflamed joints, enabling targeted delivery that boosts efficacy and safety, offering a versatile live-cell platform for RA and inflammatory diseases.

Project Summary

Rheumatoid arthritis (RA) is a chronic autoimmune disease characterised by persistent synovitis and progressive joint damage. Existing first-line therapies can cause side effects, require long-term dosing, and often fail to fully control inflammation. Triptolide, a bioactive constituent of the traditional medicinal herb *Tripterygium wilfordii* Hook F, shows strong anti-inflammatory and immunomodulatory activity but suffers from low bioavailability and dose-limiting toxicity.

Researchers harness anti-inflammatory M2 macrophages as living drug shuttles, loading them with triptolide and leveraging their natural homing to inflamed joints. This design aims to concentrate drug where it is needed, extend local exposure, and minimise systemic spillover. Researchers will evaluate trafficking, joint targeting, disease suppression, and safety in preclinical RA models. The modular cell-carrier platform can be tuned for other small molecules, herbal extracts, or biologics and expanded to additional inflammatory disorders, supporting safer, more precise translation of potent natural products.

Fig1 . Research scheme of the project

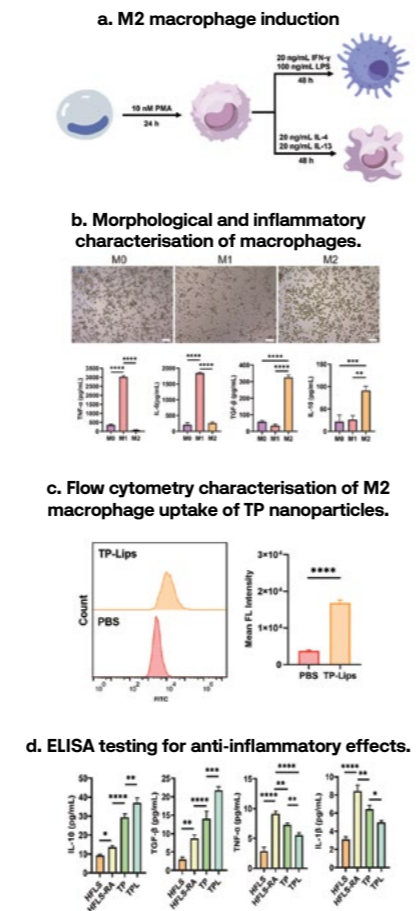


Technology Readiness Level (TRL)

Feasibility Research

2-3

Fig2 . Preparation and characterisation of macrophage-based drug delivery system



CHINESE MEDICINE DIET AND HEALTH IMAGES DATABASE PROMOTES “FOOD AS MEDICINE” GLOBALLY

Key Highlights

The Chinese Medicine Diet and Health Images Database is a free online resource featuring more than 120 traditional Chinese medicine-based recipes. This user-friendly platform empowers individuals worldwide to explore preventive health through everyday cooking and ingredients. Building on the global impact of earlier Chinese medicine databases used in over 200 countries and regions. Recipe offerings will continue to expand, further supporting health and self-care.

Project Summary



Embodying “food as medicine” fundamental elements to traditional Chinese medicine (TCM), the Chinese Medicine Diet and Health Images Database is a free, innovative resource with over 120 curated recipes. Professor Chen and his team dedicated three years to studying the compatibility of different foods and herbs, ensuring each recipe aligns with TCM theory and meets high standards of safety, accuracy, and clarity for public use. The database includes health-preserving soups, herbal teas, medicinal foods, and vegetarian dishes, catering to local dietary habits and climates while emphasising illness prevention through everyday meals.

Organised into six main categories: food crops, flowers and fruits, tea and drinks, health-preserving soups, medicinal foods, and vegetarian dishes, the database allows users to search by ingredient, health benefit, or cooking method. With multilingual access in English, traditional Chinese, and simplified Chinese, it connects seamlessly to the University’s broader suite of Chinese medicine databases, consolidating a wealth of TCM dietary knowledge.

This project builds on the widespread use of HKBU’s other five Chinese medicine databases, which have achieved over 36 million views in more than 200 countries and regions. The initiative not only advances global self-care and holistic wellness, but also plans to expand to 200 recipes, further sharing TCM’s preventive health wisdom with the world.

Access Database



PROJECT-IN-CHARGE

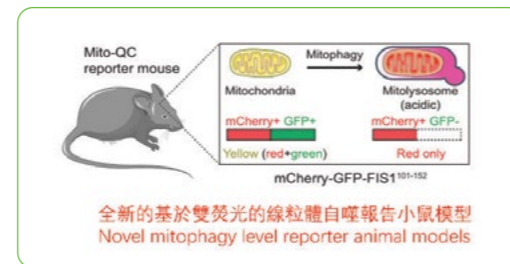
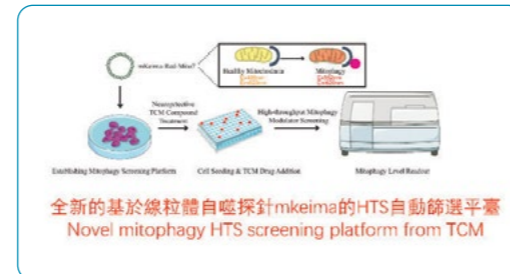
Professor Hubiao Chen
Professor, Associate Director,
Teaching and Research Division,
School of Chinese Medicine

Director,
Research Centre for Standardization
of Chinese Medicines

A HIGH-THROUGHPUT SCREENING PLATFORM FOR MITOPHAGY ENHANCERS: TOWARDS NOVEL THERAPEUTICS FOR AGE-RELATED DECLINE

Key Highlights

This project develops an integrated platform to combat age-related health challenges by improving mitochondrial function. By high-throughput screening and in-vivo validation, the integrated approach substantially shortens the drug discovery timeline and establishes a solid foundation for developing anti-aging therapeutics, particularly from Traditional Chinese Medicine.

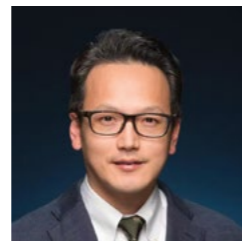


Project Summary

Global populations are aging, demanding innovative strategies for age-related health challenges. Mitochondrial dysfunction is a core driver of aging, and activating mitophagy, the selective autophagy of damaged mitochondria, represents a promising therapeutic avenue.

We have developed an integrated platform that accelerates the discovery of mitophagy modulators through a unified “in vitro high-throughput screening-in vivo validation” strategy. The in vitro system rapidly screens thousands of compounds within one week via high-throughput imaging, and the HTS platform further evaluates changes in mitochondrial energy production. For in vivo validation, an mCherry-GFP-FIS1 dual-fluorescence reporter system tracks mitophagy dynamics in real-time.

This integrated approach substantially shortens the drug discovery timeline. It helps identify several mitophagy activators from Traditional Chinese Medicine (TCM) with significant beneficial effects in animal models of neurodegenerative diseases. To further investigate the anti-aging potential of TCM, we plan to explore the mitophagy-activating effects of TCM formulas such as Sijunzi Decoction (四君子湯) or Wu Bi Tang (五痹湯). Our platform’s reliability and translational potential establish a solid foundation for developing anti-aging therapeutics.



PROJECT-IN-CHARGE
Professor King Ho Cheung
 Professor,
 Teaching and Research Division,
 School of Chinese Medicine
 Executive Associate Dean of Graduate School

Technology Readiness Level (TRL)

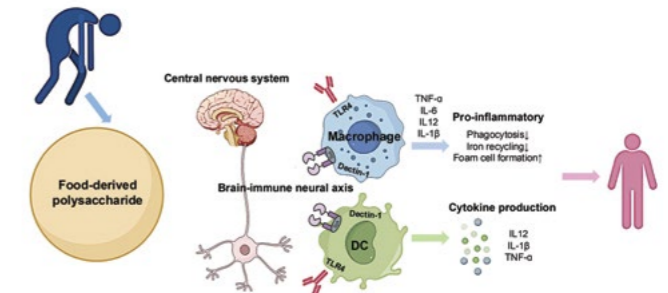
Basic Research

1-2

FOOD-DERIVED POLYSACCHARIDES AS FUNCTIONAL SUPPLEMENTS: MECHANISTIC VERIFICATION AND PRODUCT TRANSLATION

Key Highlights

This project explores the therapeutic potential of food-derived polysaccharides to alleviate anxiety and support immune health. The study delves into their mechanisms of action on the immune-neural axis and gut microbiota. It aims to translate insights into practical applications by developing a daily supplement for stress management and overall well-being.

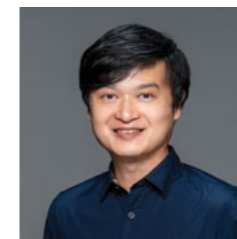


Project Summary

Traditional Chinese medicine (TCM) highlights foods like goji berries for their calming and soothing properties, improve symptoms such as dizziness, insomnia, and excessive dreaming. Contemporary research also supports that goji berry polysaccharides can modulate the nervous system and reduce anxiety-like behaviours which are closely linked to immune dysregulation and chronic inflammation via neuroinflammatory processes.

Food-derived polysaccharides exhibit significant immunomodulatory and anti-inflammatory effects and may help improve anxiety-like behaviours by regulating the immune-neural axis. They exert their effect through dual pathways on the brain-immune axis: directly activating shared receptors on immune cells and neurons and indirectly remodelling the gut microbiota to produce short-chain fatty acids. Key stress-immunity interaction nodes provide mechanistic targets.

This study explores the therapeutic potential and mechanisms of food-derived polysaccharides. The ultimate goal is to translate these insights by developing a daily polysaccharide-based supplement for stress management and immune health. Target users include individuals experiencing chronic stress and anxiety, suboptimal health due to hustle lifestyle, and those susceptible to immune imbalances.



PROJECT-IN-CHARGE
Professor Wai Po Chong
 Associate Professor,
 Teaching and Research Division,
 School of Chinese Medicine



Technology Readiness Level (TRL)

Basic Research

1-2

DIETARY PECTIN ALLEVIATES FUNCTIONAL CONSTIPATION VIA GUT MICROBIOTA AND BILE ACID REMODELLING

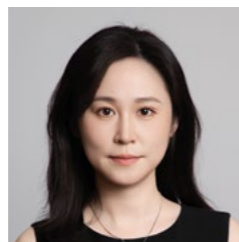
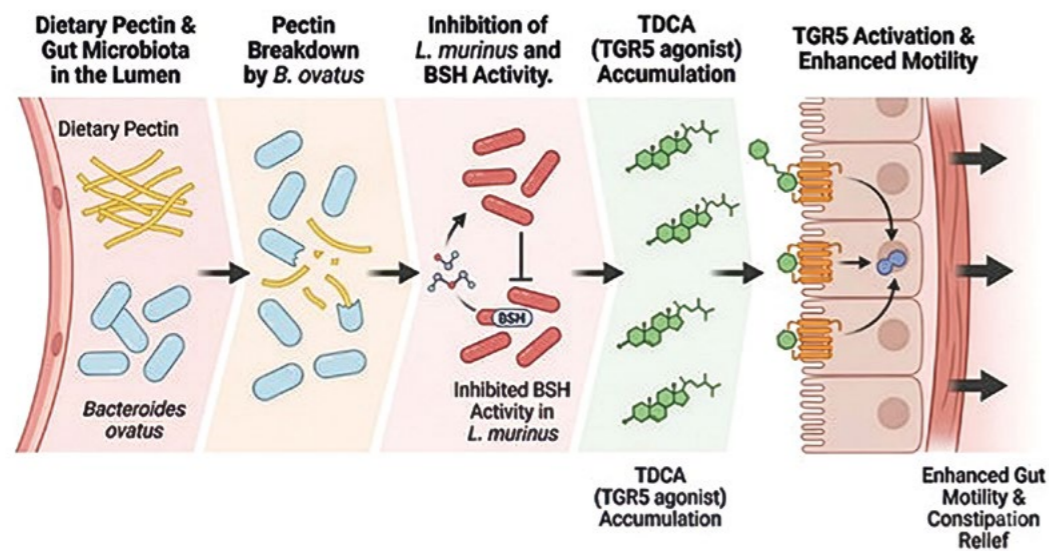
Key Highlights

Functional constipation affects millions worldwide, yet few effective treatments are available. Researchers discovered that dietary pectin synergises with a beneficial gut bacterium to relieve constipation by elevating a specific bile acid that promotes gut motility, and this effect is mediated by bacterial CAZymes gene cluster.

Project Summary

Constipation affects millions globally, but current treatments often fail or cause side effects. Researchers explored whether diet and gut bacteria could provide a natural solution. Through studies of constipation patients and animal experiments, they found that individuals with constipation lack the beneficial gut bacterium *Bacteroides ovatus* and its ability to break down pectin. Gut motility improved significantly in constipated mice following co-administration of this bacterium with dietary pectin.

The effect was mediated by a distinct mechanism: the microbe-pectin combination produced a bile acid (TDCA) that directly stimulated gut motility. A single gene cluster in *B. ovatus* (PUL18) was identified as the driver of this beneficial effect. This discovery opens the door to targeted symbiotic therapies for constipation, pairing specific bacterial strains with precision diets.



PROJECT-IN-CHARGE
Dr. Qin Liu
 Research Assistant Professor
 Centre for Chinese Herbal Medicine
 Drug Development Limited

Technology Readiness Level (TRL)

Basic Research

1-2

ADVANCING HOUZAO: FROM QUALITY ANALYSIS TO BIO-INSPIRED SUBSTITUTES FOR MARKET RELIABILITY



Key Highlights

Natural goat bezoar (Houzao) is scarce and expensive. A market surveillance study of goat bezoar-containing products found that more than 50% contained no authentic goat bezoar and that overall quality varied widely. The project team's invention provides a low-cost solution that consistently matches 99% of the chemical profile of natural goat bezoar extract.

Project Summary

Houzao, a mysterious and valuable traditional Chinese medicine for paediatric cough, has long suffered from unclear chemical composition and unreliable quality. Professor Han and his team conducted a comprehensive quality analysis using advanced techniques such as UPLC-qTOF-MS and UPLC-DAD to characterise the chemical profile of Houzao. Researchers identified ellagic acid and seven urolithin metabolites as unique markers exclusive to the medicinal portion. This study provides the first comprehensive chemical characterisation of goat bezoar, revealing its unique composition and establishing it as the only known TCM with urolithins.



In a more recent research development of Houzao, Professor Han's team addressed the ongoing scarcity, high costs, and counterfeiting challenges by creating a bio-inspired Houzao substitute. This new solution replicates 99% of the natural extract's chemical profile at affordable cost, ensuring stable supply and consistent quality across batches. Together, these projects significantly advance both the scientific understanding and practical accessibility of Houzao, supporting its modernisation and more reliable use in traditional medicine.

Access Publication



PROJECT-IN-CHARGE

Professor Simon Han
 Professor, Teaching and Research Division,
 Associate Dean (Engagement and Development),
 Office of the Dean of Chinese Medicine
 School of Chinese Medicine

Associate Director,
 Research Centre for Standardization of
 Chinese Medicines

Director,
 Research Centre for Herb Polysaccharides
 and Intestinal Immunology



Technology Readiness Level (TRL)

Technology Development

3-5



REVOLUTIONISING HEALTH MANAGEMENT: PERSONALISED NUTRITION RECOMMENDATIONS THROUGH AI

Key Highlights

This groundbreaking research developed an AI system to deliver highly personalised nutrition recommendations by analysing user data and integrating expert insights. Already operational in Hong Kong, this system is set to revolutionise health management, disease prevention, and public health education.

Project Summary

This groundbreaking research developed a cutting-edge artificial intelligence (AI) system using large language models (LLMs) to tailor personalised nutrition recommendations, revolutionising the landscape of health management.

This innovative system harnesses advanced LLM technology to meticulously analyse user data from detailed questionnaires and thorough physical examination reports. Collaborating with seasoned nutritionists and an extensive healthy meal database, the system formulates tailored dietary packages and lifestyle adjustments to meet users' health aspirations.

The scientific mechanisms involve AI-driven analysis of eating habits, lifestyles, and health conditions, as well as interpretation of physical examination reports to identify potential health risks and nutritional deficiencies. Additionally, a "Nutritionist Database" guarantees scientifically sound and practical diet plans.

Already operational a Hong Kong online food ordering platform, the system has vast and transformative real-world applications. It can foster a healthier society by providing valuable health data to insurance organisations for risk reduction strategies, and bring impact to personal health management, chronic disease prevention, and health education.



Technology Readiness Level (TRL)
Technology Development 3-5

UNCOVERING THE BITTERNESS MASKING POTENTIAL BY UMAMI PEPTIDE

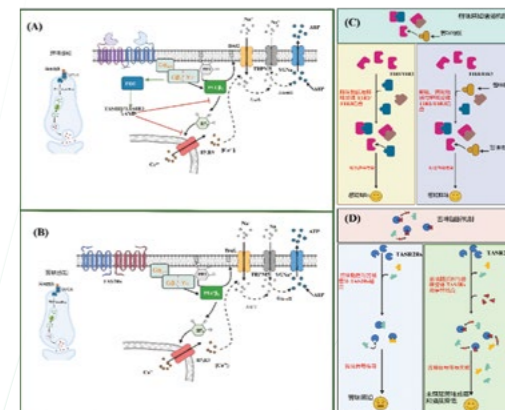
Key Highlights

This project uncovers the mechanism in which umami peptides mask bitterness, providing a crucial scientific foundation for developing novel debittering solutions applicable across the food and medicine industries.

Project Summary

The strong bitter taste and low small peptides of wheat gluten restrict its product development and utilisation of bioactive peptides. As a result, screening for food source-derived peptide bitter taste receptor blockers has become a research hotspot.

The research aims to uncover the mechanisms of how taste peptides are released and how umami peptide mask bitterness, laying a theoretical foundation for debittering technology.



Based on traditional enzymatic hydrolysis and *In-silico* analysis, this study uses papain to hydrolyse wheat gluten protein. The research team obtained the structure of the taste peptides, verified the taste peptide releasing mechanism and determined the structures of umami peptides and bitter peptides. Finally, the combined use of electronic tongue, sensory evaluation, molecular docking, and HEK293T cell model experiments determined the bitter taste masking mechanism of the umami peptides.

The umami peptides are being developed as bitter masking ingredients, expected to have widespread applications in both the food and medicine industries, particularly for debittering.

Technology Readiness Level (TRL)

Feasibility Research

2-3



PROJECT-IN-CHARGE

Dr. Wenmeng He
Assistant Professor,
Programme of Food Science and Technology,
Department of Life Sciences,
Faculty of Science and Technology,
BNU



HIGH-PRESSURE HOMOGENISATION IMPROVES FOOD QUALITY OF PLANT-BASED MILK ALTERNATIVES



Key Highlights

The project investigates that high-pressure homogenisation (HPH) serves as a promising technology to significantly improve the texture and stability of plant-based milk alternatives. By reducing particle size and enhancing viscosity, HPH offers a key solution to boost consumer acceptance.

Project Summary

Despite the growing demand for plant-based milk alternatives from traditional Chinese grains, consumer acceptance remains limited primarily due to differences in texture and flavour. This project investigates the potential of high-pressure homogenisation (HPH) to enhance the physiochemical and sensory qualities of plant-based milk.

HPH is an innovative food processing technology which modifies the structure of proteins, polysaccharides and lipids. In this study, formulations of plant-based milk, made from adzuki bean, adlay, oat and their mixtures were processed using both household homogenisers and HPH. Comprehensive analyses included colour, pH, Brix, suspension stability, total solids, soluble protein, particle size distribution, rheology, microstructure, and sensory attributes. And sensory analysis involved structured taste panels evaluating appearance, flavour, texture, and overall acceptability.

Results showed that HPH increased lightness and Brix values, reduced particle size by over 50%, and improved viscosity, indicating enhanced protein solubility and starch release. While there was no significant difference in overall acceptability, adzuki bean and oat were preferred. These findings highlight HPH as a promising approach to improving texture, stability, and consumer acceptance, fostering further product development.



PROJECT-IN-CHARGE

Professor Baojun Xu
Chair Professor, Department Head,
Programme of Food Science and Technology,
Department of Life Sciences,
Faculty of Science and Technology,
BNBU

Access Publication



Technology Readiness Level (TRL)

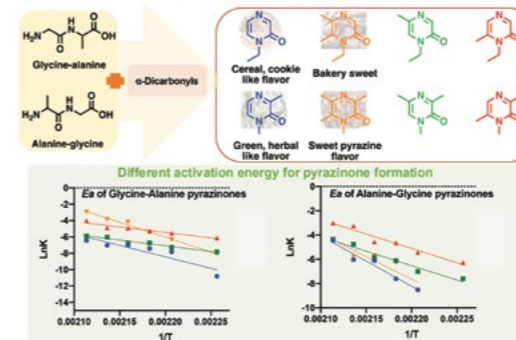
2-3

Feasibility Research

SCIENCE OF AROMA: PIONEERING PYRAZINONE FORMATION FOR ENHANCED FOOD FLAVOURS

Key Highlights

This project explores the formation and sensory properties of eight novel pyrazinones and uncovers previously undetected ones. Opening new possibilities for flavour innovation in foods, this pioneering research empowers food scientists to optimise flavour generation and food product development through controlled Maillard reactions.

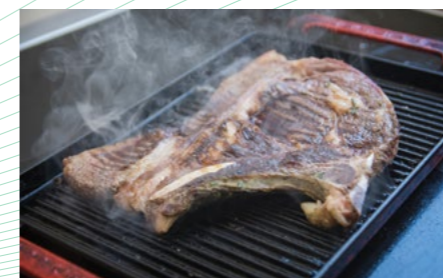


Project Summary

The Maillard reaction is fundamental to food technology, shaping the aroma and flavour profiles of foods. This project explores the formation and sensory properties of eight novel pyrazinones, an emerging group of Maillard reaction products, in Glycylalanine (Gly-Ala) and Alanylglycine (Ala-Gly) systems. Using advanced analytical techniques, the project team identified, purified, and characterised previously undetected pyrazinones.

For the first time, sensory evaluation of purified pyrazinones uncovered a diverse range of desirable flavours: cereal, cookie-like, bakery sweet, green herbal, and sweet pyrazine notes. These findings open new possibilities for flavour enhancement and innovation in processed foods, snacks, and bakery products. Activation energies required for pyrazinone formation were determined, with methylglyoxal facilitating their synthesis at lower temperatures. Peptide structure also proved crucial in flavour compound development.

These insights into formation pathways, activation energies, and sensory attributes enable food scientists to better optimise flavour generation during food processing. This pioneering research advances Maillard chemistry, laying groundwork for foods with enhanced sensory qualities and health benefits.



Access Publication



PROJECT-IN-CHARGE

Dr. Yue Luo
Assistant Professor,
Programme of Food Science
and Technology,
Department of Life Sciences,
Faculty of Science and Technology,
BNBU

Technology Readiness Level (TRL)

2-3

Feasibility Research



ECONOMICALLY MOTIVATED ADULTERATION (EMA)

Non-targeted detection of food adulteration using AI and big-data enabled collaborative database



Key Highlights

The project develops an AI and big data-powered alerting system that enables non-targeted detection of food adulteration. The system overcomes the limitations of current target-oriented methods and significantly enhancing public food safety.

Project Summary

Economically motivated adulteration (EMA) is an act of intentional food adulteration and pose long-lasting and devastating effects on public health, economy, and society. The current target-oriented detection methods are often ineffective against newly engineered and unencountered adulterants. With unlimited unknown targets, comprehensive testing is impractical, expensive and labour-intensive within the complex global supply chain.

To combat food fraud, we have developed an artificial intelligence (AI) and big data-powered alerting system. Using historical industrial data, the system enables non-targeted detection of food adulteration without extra testing. Our alerting system continuously monitors and flags suspicious samples for further in-depth testing. Starting with mid-infrared spectroscopy data of raw milk as a pilot, the system can be extended to other food commodities as well as linking up other ingredients along the supply chain and manufacturing process for prediction to safeguard public food safety.

Results have been published in Scientific Reports titled “Non-targeted detection of food adulteration using an ensemble machine-learning model”.



PROJECT-IN-CHARGE
Professor Terence Lau
 Interim Chief Innovation Officer
 Director,
 Wu Jieh Yee Institute of
 Translational Chinese Medicine
 Research

Access Publication



Technology Readiness Level (TRL)

Technology Demonstration

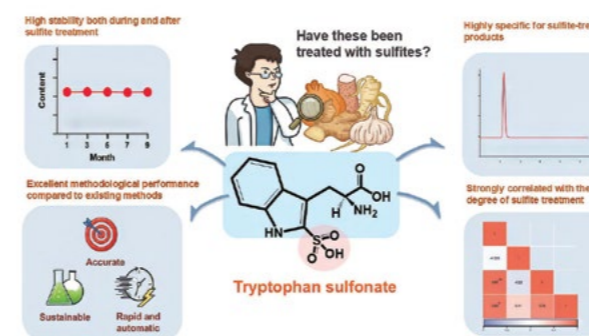
5-6

TRYPTOPHAN SULFONATE: A BREAKTHROUGH MARKER FOR ACCURATE DETECTION OF SULFUR-TREATED FOODS

Key Highlights

This project focuses on tryptophan sulfonate, a novel chemical marker for sulfite-treated food and herbal medicinal products that offers greater specificity and stability than current markers. By utilising this marker, rapid and high-throughput inspection of sulfite-treated products can be achieved with LC-MS technology.

Project Summary



Existing detection methods for sulfite-treated foods and herbal products primarily measure residual sulfites and often yield inaccurate results. False positives can occur due to interference from ingredients like garlic, while false negatives may result from prolonged storage or heating. Furthermore, the procedures are complex, labour-intensive, and chemical-intensive.

Tryptophan sulfonate, a novel marker with high specificity and stability, is identified to achieve rapid, accurate, and automated analysis. Improving environmental sustainability, the technology requires less sample and fewer solvents.

This technology has promising potential industry applications. By enabling rapid and accurate detection, it supports routine food safety inspections and essential herbal medicine quality control. Its simplicity, automation, and high specificity make the technology ideal for high-throughput industrial testing. Rapid high-throughput screening for large-scale samples brings significant businesses benefits. Operational costs are reduced by minimal reagent and solvent use, supporting sustainable practices. This ensures accurate product labelling and ultimately enhances consumer safety by reliably detecting sulfite-treated products.



PROJECT-IN-CHARGE

Professor Jun Xu
 Assistant Professor,
 Teaching and Research Division,
 School of Chinese Medicine
 Associate Director,
 Research Centre for Standardization
 of Chinese Medicines

Access Publication



Technology Readiness Level (TRL)

Technology Development

3-5



DETECTING ADULTERATION IN EXTRA VIRGIN OLIVE OIL: ANALYTICAL ADVANCES IN FOOD TECHNOLOGY

Key Highlights

Extra virgin olive oil (EVOO) is vulnerable to adulteration, challenging food authenticity and safety. This project indicates vibrational spectroscopic methods and other cutting-edge approaches enhance the detection of EVOO adulteration, ultimately supporting quality assurance in the food industry.

Project Summary

EVOO is valued for its nutrition and flavour but is often adulterated due to its high price and limited supply. Traditional official analytical methods, such as gas and liquid chromatography, are effective but often labour-intensive and require complex sample preparation and hazardous chemicals. To address this, Professor Xu are developing rapid, eco-friendly techniques to verify EVOO authenticity.



Recent advances in vibrational spectroscopy, including Fourier transform infrared spectroscopy, near-infrared spectroscopy, Raman spectroscopy, nuclear magnetic resonance, and mass spectrometry allow efficient, non-destructive analysis. Cutting-edge approaches - such as electronic noses technology, digital imaging, and DNA-based assays further improve sensitivity and can detect even small amounts of adulteration.

While chromatography remains standard, shifting to chemometric and green technologies enables real-time, onsite screening. Updating official procedures to align with recent advances will enhance sensitivity and reliability in EVOO authenticity testing, ultimately protecting consumers and supporting quality assurance in the food industry.

Access Publication



PROJECT-IN-CHARGE
Professor Baojun Xu
 Chair Professor, Department Head,
 Programme of Food Science and Technology,
 Department of Life Sciences,
 Faculty of Science and Technology, BNBU

Technology Readiness Level (TRL)

Feasibility Research

2-3

APPLYING INKJET-PRINTED NATURAL COLORIMETRIC INDICATORS AS INTELLIGENT PACKAGING WITH MONITORING THE FRESHNESS OF WHITELEG SHRIMP AS AN EXAMPLE



Key Highlights

The project introduces a scalable intelligent packaging system featuring inkjet-printed colorimetric labels for real-time freshness monitoring of whiteleg shrimp. This solution improves food safety, reduces waste, supports sustainability, and has potential for wider application in the packaging industry.

Project Summary

Food quality control is vital for food safety and regulatory compliance throughout the supply chain. This research developed an inkjet-printed natural colorimetric indicator system to monitor real-time quality changes in whiteleg shrimp, which are highly perishable and popular in Zhuhai and the Greater Bay Area. The indicators change colour in response to spoilage, showing strong correlations with shrimp quality parameters, and are integrated into intelligent packaging to give stakeholders immediate freshness information. This approach can reduce food waste by catching spoilage early and ensuring only high-quality shrimp reach consumers.



Inkjet printing technology allows for large-scale, cost-effective production of these smart labels, with potential use in other packaging sectors such as cosmetics and pharmaceuticals. The real-time monitoring enabled by these intelligent packaging labels can help stakeholders reduce food waste across the supply chain, thereby lessening environmental burdens related to disposal and resource use. Additionally, the use of industrial by-products in label production supports environmental protection and overall industry sustainability.



PROJECT-IN-CHARGE
Dr. Raymond Luo
 Assistant Professor,
 Programme of Food Science and
 Technology,
 Department of Life Sciences,
 Faculty of Science and Technology,
 BNBU

Access Publication



Technology Readiness Level (TRL)

Feasibility Research

2-3

SEARCHING FOR IMPORTANT GENES THAT AFFECT CROP OIL PRODUCTION

Key Highlights

Transgenic *Brassica napus* overexpression of key triacylglycerol (TAG) biosynthetic enzymes led to distinct changes in both the quantity and distribution of seed oil components, as well as widespread alterations in lipid-associated gene expression. This work lays a foundation for future strategies to optimise oilseed crop properties through genetic modification.

Project Summary

Oilseed rape (*B. napus*), the world's third most important oil crop, contributes about 16% of global plant oil production. This project explored the effects of genetically modifying *B. napus* to overexpress key triacylglycerol (TAG) biosynthetic enzymes, glycerol 3-phosphate acyltransferase (GPAT), lysophosphatidate acyltransferase (LPAT) and phospholipid:diacylglycerol acyltransferase (PDAT)- using genes from *Arabidopsis thaliana* and *Nasturtium (Tropaeolum majus)*. The resulting transgenic lines displayed marked differences in lipid accumulation and the distribution of major seed lipid species, such as phosphatidylcholine (PC) and TAG, along with significant changes in the expression of genes involved in acyl-lipid metabolism.

By improving understanding of how oil accumulation is regulated in plants, researchers could engineer lines with a higher oil content, especially of health-promoting unsaturated oils like linoleic acid, which would benefit biofuel production and the food industry. Furthermore, this research could lead to the modification of oil quality, tailoring it for either human consumption or industrial use.



PROJECT-IN-CHARGE

Professor Pan Liao
Assistant Professor,
Department of Biology

Access Publication



Technology Readiness Level (TRL)

Technology Development

3-5

ENHANCING THE SUSTAINABILITY OF CHITIN ISOLATION THROUGH RECYCLABLE IONIC SOLVENTS AND EDIBLE INSECT REARING

Key Highlights

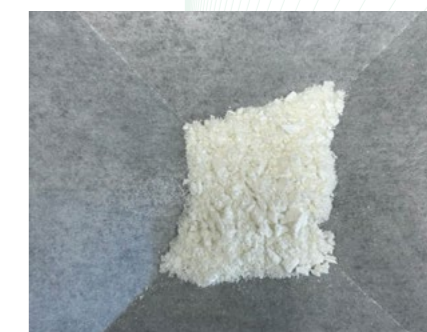
A key highlight of this project is the development of a sustainable chitin production process that utilises a recyclable ionic solvent and waste from edible insect rearing, significantly reducing chemical waste and resource consumption. The approach enables solvent reuse, making it highly promising for environmentally friendly industrial applications.



Project Summary

Chitin and its derivative, chitosan, are valuable renewable materials for applications in biomedicine, biotechnology, and the food industry. Traditional chemical methods for isolating chitin from crustacean shells are resource-intensive and can damage chitin's structure. This research introduces a novel strategy using a recyclable ionic liquid as a pulping liquor for chitin extraction, with insect rearing waste serving as the feedstock.

This innovative approach utilises a pulping liquor consisting of an ionic liquid, thereby streamlining the purification of chitin. This process not only streamlines the purification of chitin but also produces chitin of higher purity and structural integrity than commercial alternatives. The research team is currently investigating the application of these high-quality chitin samples in food-related uses, highlighting the material's potential as an insoluble fiber and food additive.



Access Publication



PROJECT-IN-CHARGE

Professor Matthew Lui Yuk-Yu
Assistant Professor,
Department of Chemistry

Technology Readiness Level (TRL)

Technology Development

3-5

BREAKTHROUGH IN THE PRODUCTION OF HYBRID RICE SEEDS

Key Highlights

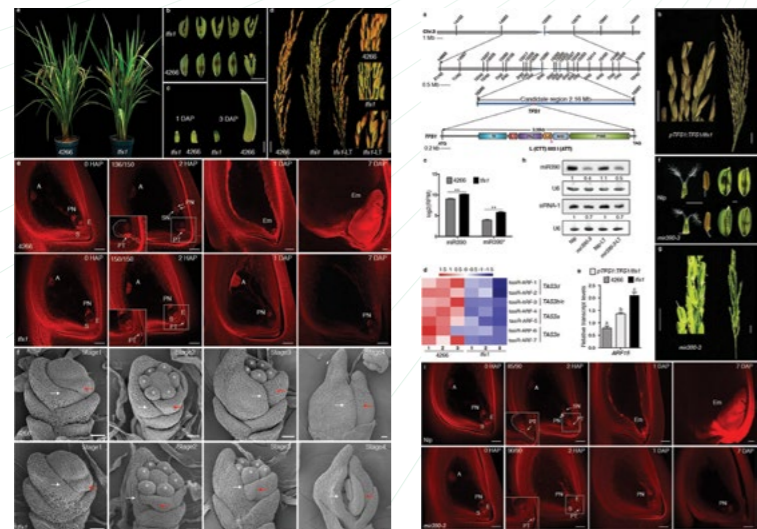
The HKBU research marks a major step in hybrid rice seed production, pioneering a new approach that boosts efficiency and reduces costs. By applying the Spontaneous Thermo-Sensitive Female Sterility 1 (TFS1) gene mutation, the team achieved a breakthrough that overcomes the limitations of the traditional “three-line” male sterility system.

Project Summary

The commonly used “three-line” male sterility technique in hybrid rice seed production involves breeding male-sterile lines as pollen receivers and restorer lines as pollen donors. However, restorer lines can also produce self-pollinated seeds, which need to be manually removed to ensure seed purity.

The new approach introduces a sterile female rice as the restorer line, eliminating this problem. Professor Zhang’s team discovered the TFS1 (Thermo-Sensitive Female Sterility 1) mutation in an elite rice cultivar. It causes female sterility at normal or high temperatures but restores fertility at low temperatures. This prevents fertilisation under certain conditions, stopping unwanted seed production.

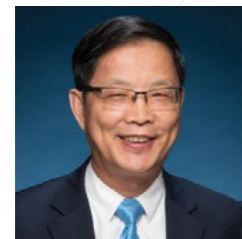
With this female sterility technique, hybrid rice seeds can be harvested automatically, ensuring purity, boosting efficiency, and reducing costs. This pioneering technique enables fully mechanised hybrid rice breeding, ensuring purity, lowering harvesting costs, and marking a breakthrough in commercial hybrid rice production.



Access Publication



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PROJECT-IN-CHARGE
Professor Jianhua Zhang
 Chair Professor of Plant Biology,
 Department of Biology

Technology Readiness Level (TRL)

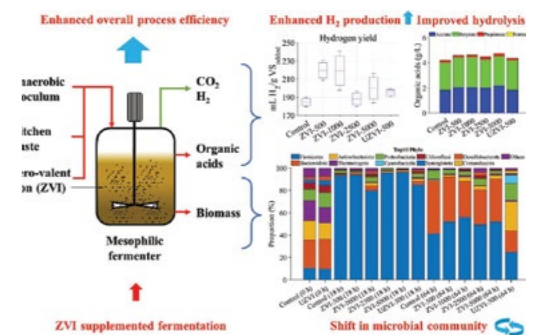
Feasibility Research

2-3

ZERO-VALENT IRON NANOPARTICLES BOOST HYDROGEN PRODUCTION FROM KITCHEN WASTE

Key Highlights

Zero-valent iron (ZVI) has demonstrated potential to enhance hydrogen production via dark fermentation of organic waste, but optimal dosing and mechanistic impacts on microbial and metabolic dynamics are not fully understood. This study systematically investigates ZVI supplementation, revealing its dosage-dependent effects on hydrogen yield, metabolic pathway shifts, and microbial community structure.



Project Summary

This study systematically evaluated the effects of ZVI supplementation on fermentative hydrogen (H₂) production from kitchen waste. By assessing ZVI concentrations ranging from 0 to 5,000 mg/L, the research team found that the addition of 500 mg/L ZVI yielded the highest H₂ production (219.68 ± 11.19 mL H₂/g VS), a 19% improvement compared to the control. Metabolic analyses demonstrated that increased acetic and butyric acid production, associated with specific metalloenzymes, played a critical role in driving higher H₂ yields. Furthermore, taxonomic profiling revealed that ZVI addition selectively enriched Firmicutes, particularly Clostridium sensu stricto 1, which were predominant during peak gas production.

Overall, this study demonstrates that ZVI supplementation not only boosts H₂ generation from organic waste, but also substantially alters both the metabolic processes and the microbial community structure involved in fermentation. These insights advance our understanding of microbial interactions and process optimisation in biological hydrogen production from waste streams.



PROJECT-IN-CHARGE
Professor Nirakar Pradhan
 Assistant Professor,
 Department of Biology

Access Publication



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Technology Readiness Level (TRL)

Feasibility Research

2-3

FOOD RESCUE PROGRAMME LINKING VOLUNTEERS WITH BAKERIES

Key Highlights

Breadline, Hong Kong's first digital food rescue platform, is developed by Professor Tam and this initiative has grown into the largest bread rescue operation. In addition to community action, the charity HKFoodWorks is founded to advance food literacy and sustainable food futures.



Project Summary

As a Humanities scholar trained in Cultural Studies, Professor Tam is interested in working towards a more inclusive, equitable and sustainable society. Professor Tam's research focus is on ethical food systems, and she has been working on the topic of food waste in Hong Kong.

In her research, Professor Tam developed a food rescue platform called Breadline – Hong Kong's first public digital application for food rescue. It connects volunteers to bakeries to collect surplus bread for those experiencing homelessness, low income, migrant and refugee families, the elderly and the intellectually disabled communities. To date Breadline is the largest bread rescue operation, collecting over 700,000 loaves of bread and preventing 490 metric tons of CO₂ and 1.87 million gallons of water from being needlessly wasted.



In addition to community action, Professor Tam founded HKFoodWorks, a registered charity dedicated to education and research, to improve food literacy for sustainable food futures.



PROJECT-IN-CHARGE

Professor Daisy Tam
Associate Professor,
Department of Humanities &
Creative Writing

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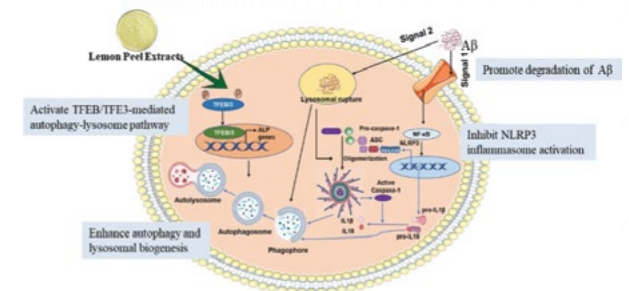
SHEMINFU LIMITED



Food-derived New Autophagy Inducer: Lemon Peel Extract

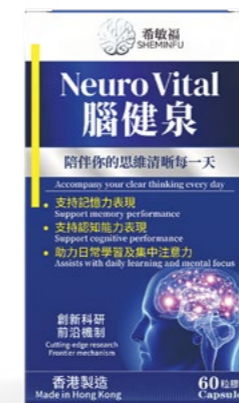
Sheminfu Limited is innovating brain health solutions by harnessing the homology of medicine and food, specifically utilising a natural lemon peel extract. Neuro Vital, a pioneering brain health supplement, is developed to address critical health crises including rising Alzheimer's prevalence and inevitable age-related cognitive decline. Designed for aging adults, it offers a safe, food-derived, and scientifically-backed solution.

Neuro Vital outperforms current market competitors with significant technological breakthroughs. TFEB-mediated autophagy induction is utilised to effectively clear toxic brain aggregates like A β , P-Tau, and the dual-action mechanism simultaneously degrades harmful substances and significantly reduces neuroinflammation. Its food-derived ingredient, natural lemon peel extract, ensures high safety with no side effects. In addition, its versatile formulation maintains efficacy across various dosage forms like capsules, effervescent tablets, and gummies.



Being the first brain supplement with food-derived ingredient as a powerful autophagy inducer, Neuro Vital is poised to revolutionise the existing market of brain health supplements with rigorous scientific proof.

[Learn More](#)



FOUNDER

Professor Min Li
Dean and Chair Professor,
School of Chinese Medicine

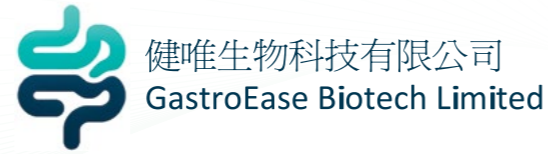
Associate Director, Vincent V.C. Woo Chinese Medicine
Clinical Research Institute

Ma Pak Leung Endowed Professor in Innovative Neuromedicine

GASTROEASE BIOTECH LIMITED

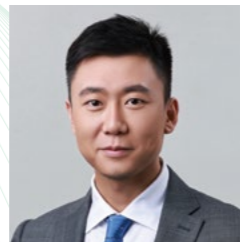
Restoring Digestive Harmony with Advanced Biotechnology

GastroEase Biotech Limited, an HKBU start-up, is advancing gut health through innovative biotechnology. Its lead candidate, GAD-1205 is a dual-target therapy for serotonin-related diarrhea, combining gut metabolites OEA and HDCA to inhibit serotonin over-synthesis and accelerate clearance. In parallel, OEA (GAD-1201) is being developed as a health supplement to support metabolic health, appetite control, and gut function.



This approach restores serotonin balance in IBS-D and carcinoid syndrome by inhibiting the synthesis enzyme TPH1 while enhancing serotonin transporter (SERT) activity, with excellent biocompatibility due to endogenous metabolites. Challenges include navigating regulatory pathways against benchmark drug XERMELO and educating consumers on OEA's dual role as supplement and therapy.

GastroEase stands out with dual market reach, a novel mechanism, and strong IP protection across PCT, US, and China patents. Development plans include launching OEA supplements in Asia by 2026–2027, advancing GAD-1205 into trials by 2027–2030, and securing global partnerships thereafter.



FOUNDER

Professor Lixiang Zhai
Assistant Professor,
Centre for Chinese Herbal
Medicine Drug Development Limited

HONG KONG AUTHENTICATION CENTRE OF VALUABLE CHINESE MEDICINES LIMITED

Ideal cost-effective routine testing for valuable Chinese Medicine authentication

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.



FOUNDER

Professor Simon Han
Professor, Teaching and Research Division,
Associate Dean (Engagement and Development),
Office of the Dean of Chinese Medicine
School of Chinese Medicine

Associate Director,
Research Centre for Standardization of Chinese Medicines

Director,
Research Centre for Herb Polysaccharides and Intestinal Immunology



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CRIMSON VISION TECHNOLOGY LIMITED



Empowering industries with instant portable material analysis solutions through NIR and IoT technologies



Crimson Vision is committed to the development of near-infrared (NIR) detection and visualising technologies for fast and portable authentication and detection services for fruit in the commercial and retail market.

Through the patented Near-Infrared (NIR) detection and visualising technologies, it has achieved fast and accurate material analysis capabilities with the portable detector, all in a non-destructive manner. Currently, fruit sugar levels are predominantly measured using intrusive methods such as reflectometers and liquid chromatography, which can damage the fruits during the measurement process. Other non-destructive methods, like spectrometers, are limited, complex, bulky, and expensive.

By utilising NIR technology, which is absorbed and reflected within the fruit, its organic photodetector can capture the signal with exceptional sensitivity and accuracy. By measuring the absorbance after diffuse reflection and comparing it with our extensive database using sophisticated algorithms, various qualities of the fruit, including sugar level, water content and acidity, can be discerned in a non-invasive manner.

With Crimson Vision's solution, the portable fruit quality detector can authenticate fruit species and assess fruit qualities faster and more affordably. By capturing the sugar level (Brix), acidity, and water content of the fruit, swift and cost-effective fruit authentication and quality detection can be achieved.



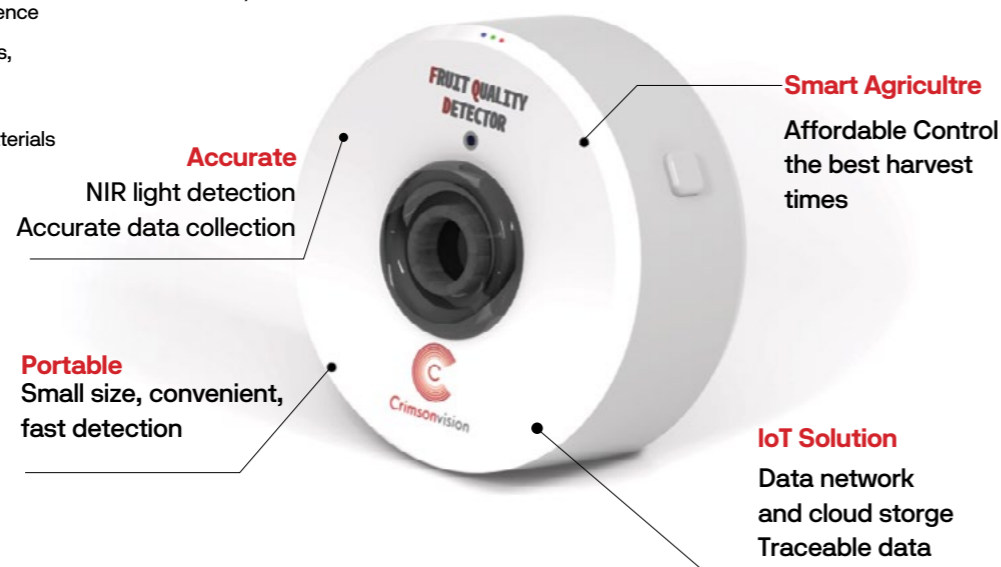
FOUNDER
Professor Furong Zhu

Associate Dean (Reserch and Postgraduate Studies),
Office of the Dean of Science
Chair Professor in Physics,
Department of Physics
Director,
Institute of Advanced Materials

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Traceable fruit quality detection technology and IoT solution



A.I. SAFE FOOD LIMITED

Revolutionising food safety with machine learning



In a world where food fraud poses a significant threat to consumer safety and industry integrity, A.I. Safe Food is pioneering a groundbreaking solution. The business objective of this innovative company is to combat food fraud by leveraging artificial intelligence. Recognising the vulnerabilities within the complex food supply chain, the company has developed a proprietary non-targeted machine learning alerting system designed to detect and prevent fraudulent activities in the food industry.

A.I. Safe Food offers distinct advantages to both the food industry and governmental testing laboratories. By utilising advanced machine learning algorithms, this system enables the non-targeted detection of unknown food adulterants without the need for additional testing. For food industry customers, A.I. Safe Food can tailor the detection system to their specific needs, solving the long-unmet industrial concern of preventing the next food fraud event, and to protect the brand from fraudster.

Initially based on dairy products, the company is working with industry leaders to establish their own detection system for avoiding the next melamine-like incident. This alerting system can also be applied to other food commodities as well as food quality monitoring associated with seasonal and annual changes. By collaborating with key organisations and stakeholders in the food safety sector, the company aims to contribute itself in the fight against food fraud.

Through its industrial-friendly alerting system, A.I. Safe Food offers a cost-effective, versatile, and highly accurate solution to safeguarding food safety. With a strong foundation in data-driven insights and industry endorsements, this company is poised to revolutionise the landscape of food safety testing and ensure consumer protection for years to come.



FOUNDER
Professor Terence Lau
Interim Chief Innovation Officer

Director,
Wu Jieh Yee Institute of Translational Chinese
Medicine Research

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MICROFLOW INNOVATION LIMITED



MicroFlow

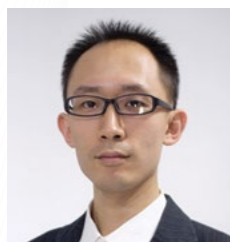
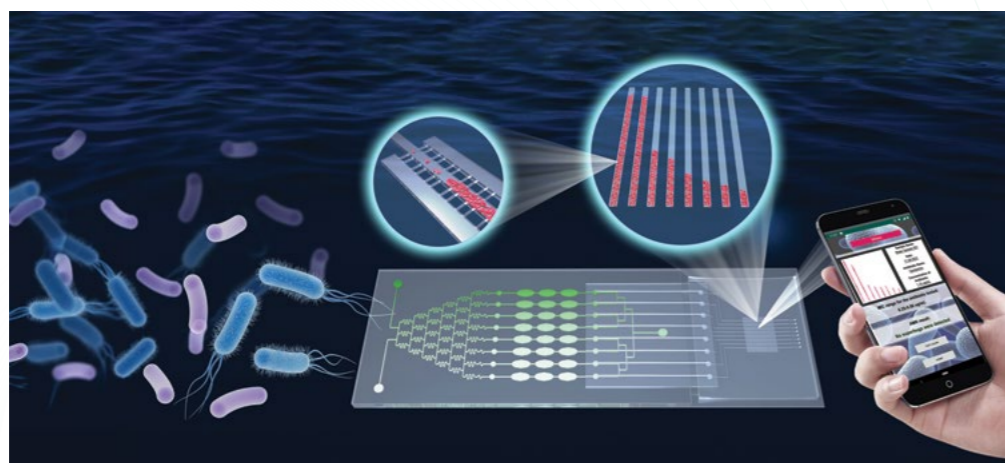
“Barcode” cell sensor microfluidic system: Rapid and sample-to-answer antimicrobial susceptibility testing applicable in resource-limited conditions



MicroFlow Innovation Limited is dedicated to improving the antimicrobial susceptibility tests (ASTs), surveillance of antimicrobial resistance (AMR) in resource-limited environment.

With a mission to bring microfluidic techniques into point-of-care-tests (POCTs) development and analysis of drug-resistant bacteria, Professor Ren has developed the antimicrobial susceptibility testing (AST) system, which includes a whole-polypropylene chip and a “barcode” cell sensor as the key parts. This novel system is designed for mass screening of antimicrobial bacteria in the environment and food.

This platform can serve as a cost-efficient sample screening tool to quickly detect any sample with potential drug-resistant bacteria, which can then be sent for subsequent advanced analysis. It is expected this system will become a useful tool for the routine screening of drug-resistant bacteria in different situations, such as the food industry, public areas, and healthcare facilities, which can be applied without advanced clinical assay facilities or operator skill.



FOUNDER

Professor Kangning Ren
Professor,
Associate Head (Research),
Department of Chemistry

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PISHON BIOTECH LIMITED

Justicia Chinese Medicinal Plants: Innovative Food-Based Solutions for Animal Health and Food Safety



This project identifies *Justicia* plants as a natural feed additive to combat viral threats in animals, offering a safe, cost-effective solution for sustainable food supply chain and livestock production. *Justicia* plants, traditionally used in Chinese medicine, is found to yield extracts that broadly inhibit viral replication by blocking viral entry without harming host cells.

Safeguarding livestock health is crucial for food safety and sustainable agriculture. After studying over 6,500 plant extracts from the Lingnan region, the research team identified *Justicia* plants as a promising food-based solution to combat viral threats in animals. Traditionally valued in Chinese medicine, *Justicia* plants are now being developed as a natural feed additive to enhance animal health.



Extracts from *Justicia* plants can effectively inhibit H5N1 virus replication without harming host cells. The active compounds showed broad antiviral activity at low concentrations against viruses such as H5N1, Japanese encephalitis, Zika, HIV, SARS-CoV-2, and Ebola. The active plant compounds, including patented aryl-naphthalene lignans, demonstrated an impressive 99% H5N1 inhibition rate in safety-tested animal models by blocking viruses from entering cells.

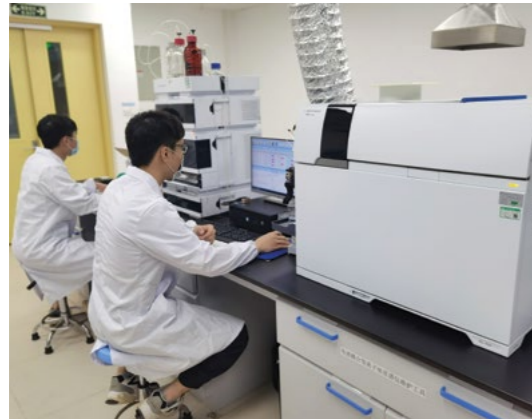
Incorporating *Justicia* plants-based formulations into animal feed helps prevent disease outbreaks, reduce culling, and support animal welfare and food security. This innovative ‘food as medicine approach’ offers safe, natural, and cost-effective solutions for food supply chain protection and sustainable livestock production. In addition, this formula can be applied to the pet industry as a pet supplement, providing pets with extra protection and perfecting the concept of “One Health”.



FOUNDER

Professor Hongjie Zhang
Chair Professor,
Associate Dean (Teaching and Learning),
Office of the Dean of Chinese Medicine,
Cheung On Tak Endowed Professor in
Chinese Medicine,
School of Chinese Medicine

ZHUHAI GUANGDONG-HONG KONG FOOD SAFETY TESTING CO LIMITED



珠海粤港食品安全检测有限公司
Zhuhai Guangdong-Hong Kong Food Safety Testing Co.Ltd

Established in 2018, the food testing centre is a leading facility in the Greater Bay Area that provides third-party testing and analytical research experiments on food safety and agricultural product safety. The testing services adhere to national regulations in China, ensuring compliance and accuracy.

Through collaboration with esteemed institutions such as the State Key Laboratory of Environmental and Biological Analysis of HKBU and Zhuhai Key Laboratory of Agricultural Products Quality and Food Safety of BNBU, the centre offers a comprehensive range of testing services. This includes contaminant testing, microbiological testing, and residue testing for various food products, including meat products, dairy products, and processed foods in addition to raw agricultural products.



Currently, the centre holds 5,585 qualifications under the CMA (China Metrology Accreditation for Food) and CNAS accreditation in the field of food testing. Additionally, it possesses 2200 qualifications under the CATL testing for agricultural products. These accreditations demonstrate the centre's commitment to maintaining high standards and providing reliable testing services in the field of food and agricultural product safety.

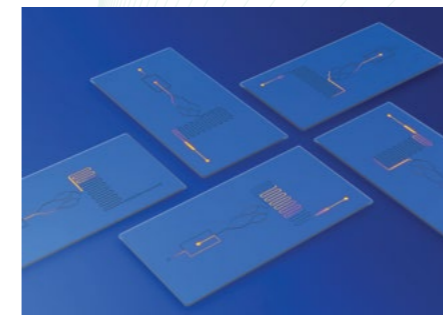
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ZHUHAI SILVER ARK BIOCHIP CO LIMITED



Established in 2021, Zhuhai Silver Ark Biochip Co Limited is an integrated company that focuses on the research, design, manufacturing, and application of microfluidic chip based analytical instruments. Located in Zhuhai, the company specialises in the R&D, sales, and marketing of microfluidic chips and molecular diagnostic technologies in the field of food safety testing.



The team of core technical team members have extensive experience leading and participating in numerous national key research and development projects, as well as projects of the Ministry of Science and Technology. They have successfully obtained multiple invention patents and achieved various technology transfer outcomes.

Currently, a range of products are available, including handheld pesticide residue detectors, microfluidic intelligent pesticide residue detectors, microfluidic intelligent cell counters, supporting chip reagents, and aquaculture disease detection reagents. These products showcase the company's commitment to providing innovative solutions in the field of microfluidic technology and contribute to the advancement of food safety testing.



FOUNDER
Professor Bo Lei
Adjunct Professor,
Department of Chemistry

HKBU LABORATORIES, INFRASTRUCTURE AND FACILITIES

Wu Jieh Yee Institute of Translational Chinese Medicine Research

Funded by the Wu Jieh Yee Charitable Foundation, Wu Jieh Yee Institute of Translational Chinese Medicine Research (WJY ITCMR) is set to be a modern Chinese medicine development platform equipped with advanced research infrastructure, dedicated to translating research outcomes into clinical applications and commercialisation, to drive the standardisation and internationalisation of Chinese medicine.

Located at Hong Kong Science Park, the Institute focuses on four specialised research areas:

01 Phenomics Research

02 Smart Medical Device and Bioengineering Technology

03 Herb-drug Interaction Analysis

04 Clinical Data Science



The Institute also strives to advance 'Food as Medicine' initiative by leveraging HKBU's strengths in Chinese medicine, providing support to drive translation and commercialisation of research outcomes.

By leveraging cutting-edge equipment, information and intelligent database, diagnosis and prescriptions assisted by artificial intelligence, and personalised medical management systems, the Institute is committed to advancing smart Chinese medicine, fostering more interdisciplinary and cross-industry collaborations, and exploring cooperation opportunities between Guangdong and Hong Kong, with the aim to position Hong Kong as a modern and international hub for Chinese medicine for the betterment of society.

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Berberine Nutraceuticals:

Evidence-based transformation of ancient wisdom into modern functional foods

At WJY ITCMR, our pioneering research on berberine nutraceuticals demonstrates our commitment to transforming traditional medicinal ingredients into innovative, evidence-based health products. Berberine, a golden-yellow alkaloid derived from Berberis species, shows remarkable potential as a nutraceutical ingredient with scientifically validated health benefits.

Berberine activates AMP-activated protein kinase (AMPK), the body's "metabolic master switch." Clinical studies reveal that berberine supplementation can reduce blood glucose levels and improve long-term glycaemic control, with efficacy comparable to conventional diabetes treatments. However, its very low absorption (about 0.5% in human) and gastrointestinal side effects, such as diarrhoea in approximately 30% of users, limit its widespread application.

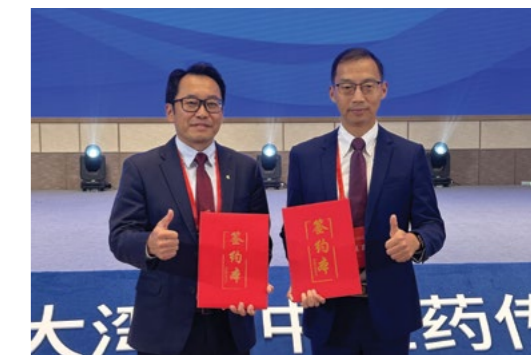
To overcome these challenges, our research team systematically identifies safe excipients, evaluates manufacturability, and conducts animal studies to refine formulations suitable for clinical studies and evidence-based evaluation. By integrating biotechnology, food safety protocols, and targeted delivery systems, we aim to maximise berberine's bioavailability while minimising side effects.

We collaborate with industry leaders and regulatory agencies to translate berberine research into commercially viable products that meet international food safety standards and deliver tangible health outcomes. This initiative aligns with HKBU's strategic focus on "Food as Medicine" and establishes the University as a leader in evidence-based functional food innovation. Through the synergy of traditional Chinese medicinal knowledge with advanced food technology, we are developing next-generation nutraceuticals to address global health challenges while upholding the highest standards of safety and quality.



HKBU-Infinitus Joint Lab of Polysaccharide Research

Herb polysaccharides, being safe and effective, show great medication potential. However, few polysaccharide-based new medicines have been developed because polysaccharides are hardly absorbed into blood and their bioactivities are widely doubted. Following the Memorandum of Understanding signed between HKBU and Infinitus (China) Company Limited, the HKBU-Infinitus Joint Lab of Polysaccharide Research is established for exploring the potential health benefits of herb polysaccharides and their applications in the field of nutrition and Chinese medicine.



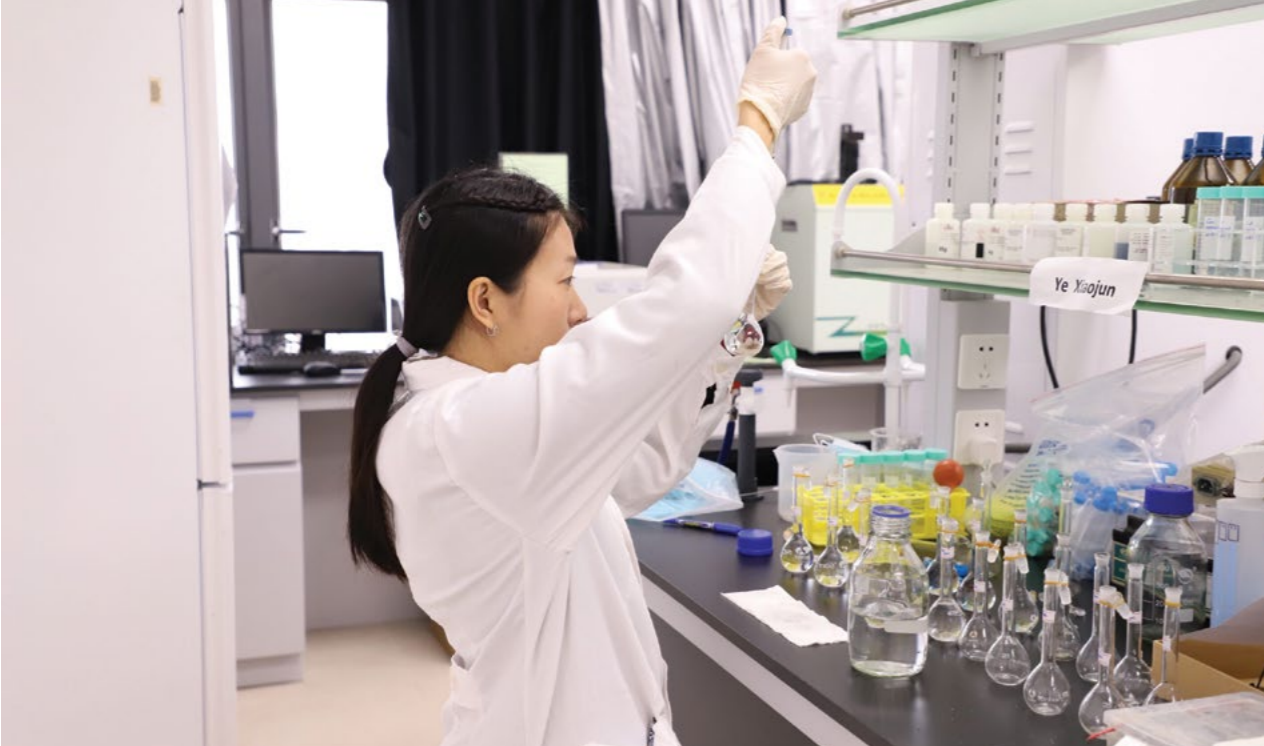
The mission of this Joint laboratory is to explore the potential health benefits of herb polysaccharides and their application in the field of nutrition and Chinese medicine by:

1. Establishing a platform for polysaccharides structure research and quality control to improve the quality of polysaccharide products.
2. Investigating the pulmonary immune enhancing function and mechanism of action of polysaccharides to provide new sources for composite polysaccharide products.
3. Screening herb polysaccharides with potential inhibitory effect on intestinal polyp growth to provide new sources for composite polysaccharide products.
4. Developing composite polysaccharide products as health products to enhance health and nutrition practice and strengthen the collaboration between academia and industry in addressing contemporary health challenges.

The objectives of this Joint laboratory are:

1. To conduct in-depth research on herb polysaccharides
2. To enhance long-term collaboration between HKBU and Infinitus for translating research findings into practical applications





Zhuhai Key Laboratory of Agricultural Products Quality and Food Safety

The Zhuhai Key Laboratory of Agricultural Products Quality and Food Safety was established as Zhuhai's key laboratory in 2015. The laboratory's primary focus is to promote food nutrition and health, prioritise food safety, and undertake targeted research and development of products.

In response to the advancements in food safety testing technologies, BNBU has collaborated with the Wang Lab of Molecular Food Safety at the University of British Columbia in Canada. Together, they are establishing key safety control points in the production, preservation, and transportation processes of sea bass. By integrating modern molecular detection and strain typing technologies, BNBU is developing innovative molecular detection methods to enhance the monitoring and control of food safety. Additionally, BNBU is working in partnership with the Technical Centre of the General Administration of Customs to jointly develop rapid food safety testing technologies and instruments. This collaborative effort improves the efficiency and accuracy of food testing, ensuring the timely detection and resolution of food safety issues.

Through the collective efforts of the government, industry, academia, and research institutions, along with international and local collaborations with experts and institutions, BNBU can leverage advanced research experience and technology in the development of new food safety testing technologies. This enhances the laboratory's research capabilities and enables it to make significant contributions to the field of food safety.



Food Science and Technology Laboratories in BNBU

There are 13 food related laboratories in BNBU which are well-equipped with advanced facilities for cell culture, biochemistry and biotechnology, chemical and food analysis, and food processing.

The Food Science and Technology labs are the key developing labs in BNBU, which consist of **three teaching laboratories** (Food Processing Laboratory, Food Analysis Laboratory, Chemistry Lab), **six research laboratories** (Health Food Lab, Laboratory Kitchen, Food Sensory Evaluation Lab, Molecular Biology Lab, Animal Cell Culture Room, Microbiology Lab) and **four supporting functional laboratories** (Walk-in Cooler and Freezer, Weighing room, Sample Retention Room, Water Purification Room), as well as the BNBU Food Safety Testing Centre, with a total of 1,500m².

The labs in BNBU focus on 6 major research areas:

Biotechnology and Food Safety

Health Promoting Effects of Bioactive Dietary Components

Nutrition and Health

Food Processing, Flavour Chemistry & Sensory Science

Biomedical Materials and Targeted Drug Delivery

Food Packaging Innovation

FOOD TECH RELATED FACULTIES AND DEPARTMENTS

Faculty of Science

Department of Biology

Department of Chemistry

Department of Computer Science

Department of Mathematics

Department of Physics

School of Chinese Medicine

Beijing Normal-Hong Kong Baptist University (BNBU)

Faculty of Science and Technology

Department of Life Sciences – Food Science and Technology




Department of Life Sciences – Environmental Science





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