

ANNUAL REPORT 2020/21

Recurrent Funding for Knowledge Transfer
for the 2019/20 to 2021/22 Triennium

submitted to
University Grants Committee



香港大學
THE UNIVERSITY OF HONG KONG

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EXECUTIVE SUMMARY

Knowledge exchange (KE) is among the pillars of The University of Hong Kong (HKU), which has a long tradition of contributing to the community. With a firm belief that advances in research and knowledge can benefit and improve the world through KE, HKU had refined its KE strategy in 2020/21 and bolstered impactful KE initiatives under the helmsmanship of Dr Yiwu He, who serves multiple roles in the HKU, including Senior Advisor to the President, the University's first Chief Innovation Officer, Director of Knowledge Exchange Office, Director of Technology Transfer Office, and leader of iDendron which is the University's incubator for new businesses.

Following the direction enshrined in HKU's Vision 2016-2025, HKU had continued to embark on various high impact KE and knowledge transfer programmes in 2020/21, including online seminars and technology transfer as well as public education through the mass media.

In 2020/21, the KE efforts of HKU broke new ground with the launch of the inaugural university-level HKU Innovator Award and the HKU Young Innovator Award. The HKU Innovator Award recognises innovations in KE, which is important to spur sharing of innovations with the broader community. The HKU Young Innovator Award recognises outstanding young academics whose innovations demonstrate exceptionally high potential impact (legacy or projected legacy) with transformative results to foster development.

The Knowledge Exchange Office (KEO) had continued to implement various KE programmes in collaboration with the faculties, including the annual Impact Project Funding Scheme in 2020/21, which has become an important enabler for academic staff to benefit the broader community with their expert knowledge and research. The maximum amount for each Impact Project bid was raised from HK\$100,000 to HK\$150,000 starting from the 2020/21 exercise to strengthen support for worthwhile KE projects.

HKU's outstanding achievements in innovation and technology came under the spotlight in 2020/21, including the technology to test SARS-CoV-2 virus in the sewage. It was a prime example of bringing the benefits of research out of laboratories to benefit the community. The technology has been instrumental in preventing massive community outbreak of SARS-CoV-2 by detecting 'silent carriers' or people who are asymptomatic through monitoring the virus levels in sewage. A cross-disciplinary research team led by Professor Tong Zhang of the Department of Civil Engineering of HKU spearheads the research in this area. The Technology Transfer Office (TTO) coordinated the patent filing and commercialisation of this new sewage testing method. The new testing method, which now also covers mutated variants of the SARS-CoV-2 virus, has proved to be a vital tool to safeguard public health in Hong Kong.

The year also saw the clinical trials of HKU's flu-based COVID-19 vaccine in Mainland and Hong Kong. The HKU team, led by Professor Honglin Chen, alongside team members Dr Pui Wang, Professor Zhiwei Chen and Professor Kwok-Yung Yuen, created a SARS-CoV-2 vaccine candidate based on a previously established flu-based DelNS1 live attenuated influenza virus (LAIV) platform. TTO worked with Professor Chen to structure the collaboration and settle relevant agreements with Wantai Biopharm for pre-clinical studies and clinical development. With the launch of the phase I clinical trial by Wantai in the Mainland in September 2020, HKU's vaccine became the world's first nasal spray vaccine for COVID-19 in human trial. Wantai completed both phase I and phase II clinical trials in the Mainland. Meanwhile, HKU research team worked with HKU Clinical Trial Centre and started a phase I clinical trial in Hong Kong in March 2021. TTO facilitated the conclusion of the funding agreement with Coalition for Epidemic Preparedness Innovations, which allowed the HKU team to receive US\$4.89M for the production of clinical trial materials, and the investigation of mucosal immune responses during the phase I clinical trial.

TTO also organised and hosted the Technology Transfer Primer, which was a webinar series to provide HKU's principal investigators and start-up cofounders with practical and valuable insights into business growth.

iDendron, which is the innovation & entrepreneurship hub of HKU, continued to promote the innovation & entrepreneurship culture in 2020/21 through interdisciplinary education and support for HKU early stage startups with different programmes, such as Entrepreneurship Academy, Incubation Programme, and SEED Programme.

Since 2011, KEO and Graduate School of HKU have jointly organised the annual 3MT Competition, challenging final year research postgraduate students to explain their research within 3 minutes to a general audience. In view of the COVID-19 pandemic, HKU 3MT 2021 was hosted in a virtual format (video submission) from April to June 2021. The winner of the HKU 3MT Competition will represent HKU in the Asia-Pacific 3MT Competition in October 2021.

1. DEEPENING INSTITUTIONAL CAPACITY FOR REALISING AND CORROBORATING IMPACTFUL RESEARCH

In 2020/21, the Knowledge Exchange (KE) efforts of The University of Hong Kong (HKU) began a new chapter as our KE strategy had been further honed and bolstered under the helmsmanship of Dr Yiwu He. For the first time, innovations in KE had been recognised in the form of the prestigious university-wide HKU Innovator Award. Also, new and upcoming generations of academics zealous at KE embarked were encouraged with the launch of the inaugural HKU Young Innovator Award.

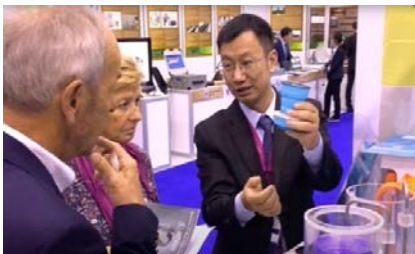
The Knowledge Exchange Office (KEO) had continued to implement various KE programmes in collaboration with the faculties. It had also assisted the senior management of HKU to review the KE strategies and formulated details of the new HKU Innovator Award and the HKU Young Innovator Award. Notwithstanding the ongoing limitations and challenges brought by the COVID-19 pandemic, KEO had worked ceaselessly with various stakeholders, both in HKU and the community, to promote KE.

1.1 University-level Awards

The KE Excellence Award is a university-level award to recognise outstanding KE accomplishment that has made significant economic, social, environmental or cultural impacts to benefit the society. The 6th round of the university-level KE Excellence Award was organised in the year.

Recognising innovations is equally important to spur sharing of innovations with the broader community. The new HKU Innovator Award and the HKU Young Innovator Award are the university-level awards established to recognise outstanding Faculty members whose innovations demonstrate exceptionally high potential impact (legacy or projected legacy) with transformative results to foster development. In contrast with the KE Excellence Award which requires evidence that the impact already exists, evidence of potential impact is also considered for these awards. Research-led innovation may take many forms, including the creation of distinctive and new products or models; commercialisation activity; entrepreneurial activity; social enterprise; or policy change.

HKU Innovator Award: Nano Solutions for Cleaner Air and Water



Clean water and air are vital to protect the public health. The research team led by Professor Chuyang Tang spearheads the development of high-efficiency and environmentally sustainable filter materials that remove harmful pollutants from water and air. His team designs novel

architectures and functionalities for water and air filters to enable high permeability (thus reducing energy consumption will the same or improved comfort level), high removal efficiency (thus better protection for public health), and excellent reusability (thus better sustainability).

Professor Chuyang Tang of the Department of Civil Engineering received the inaugural HKU Innovator Award. More details of his innovation are found in the KE Newsletter at: www.ke.hku.hk/story/nano-solutions-for-cleaner-air-and-water.

HKU Young Innovator Award: Surgical Robots with New Eyes

Dr Ka Wai Kwok has been pioneering in surgical robotics with an ambitious goal to advance and transform engineering technologies into actual clinical practice. Dr Kwok and his team are one of few academic groups that comprehensively cover intra-operative magnetic resonance (MR) image processing, MR-safe / conditional robot sensing, positional tracking, and navigation and actuation, thus developing surgical robots for effective surgical workflow under the very strong magnetic field (1.5/3T) generated by MR imaging (MRI). They have developed multiple 'world-first' prototypes for MRI-guided robots for intra-cardiac catheterisation and bilateral stereotactic neurosurgery. These innovations are recognised by international robotics societies with awards, not least drawing interests from industry for further commercialisation development.



Dr Ka Wai Kwok of the Department of Mechanical Engineering received the inaugural HKU Young Innovator Award. More details of his innovation can be found in the KE Newsletter at: www.ke.hku.hk/story/all/surgical-robots-with-new-eyes.

KE Excellence Award: Reduction of Illegal Global Wildlife Trade Through Novel Conservation Forensics Research



Conservation research undertaken at HKU allowed increased enforcement of national and international law protecting endangered species and supporting illegal wildlife trade reduction. Conservation actions stemming from this research resulted in increased protection of turtles, pangolins and fish under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the International Union for Conservation of Nature (IUCN). Further, newly

developed forensics techniques uncovered extensive criminal activities and supported successful prosecution. This research has led to significant reductions in illegal trade.

The team from the School of Biological Sciences, Dr Caroline Dingle, Dr David Baker, Dr Timothy Bonebrake and Professor David Dudgeon, has adopted conservation forensics to provide authorities investigating illegal wildlife trafficking with accurate scientific data to use against traffickers. The team received the University's Knowledge Exchange Excellence Award 2020 for this project.

More details can be found in the KE Newsletter at: www.ke.hku.hk/story/all/using-data-to-protect-wildlife.

1.2 Faculty KE Awards

The 10th round of the Faculty KE Awards Scheme was organised in the year. The award scheme aims to recognise significant and exceptional KE impact of HKU academic staff in each Faculty. The responses were encouraging with high quality entries. The two examples described below are among those recognised in the Faculty KE Awards Scheme in 2020/21.

Combating COVID-19 through Knowledge Exchange

The world is facing an unprecedented threat from COVID-19 in 2020. As a leading research and education institute in public health in Asia, the School of Public Health is very actively contributing to COVID-19 response in multiple areas such as research, policy guidance, media communication, and public education.



Since the outbreak, Professor Keiji Fukuda and his research team have been exploring the science of the virus, its detection, epidemiology, prevention, and health policy interventions. The research findings have provided solid and science-based foundation for policy decisions and public education.

Research findings of Prof Fukuda and his team have facilitated the formulation of evidence-based public health policies on COVID-19, as well as informed the pandemic intervention strategies of the Hong Kong Special Administrative Region (HKSAR) Government and various professional bodies. Local, mainland and international media channels have reported HKU's findings extensively and valued the public health advice and findings. HKU's public education via various channels has enriched knowledge on health, or health literacy, among the general

public.

Through KE in a two-pronged approach – with policy advice tendered to senior level policymakers and a public education drive targeting the general public, and by utilising the media as a bridge of communication between policymakers and the society, the School of Public Health contributed to keeping COVID-19 under restraint in Hong Kong and sharing HKU's research findings and best practices with the global community.

Professor Keiji Fukuda and his team received the Faculty KE Award 2020 of the Li Ka Shing Faculty of Medicine. More details are at [Annex I-A](#).

JC A-Connect: Jockey Club Autism Support Network



Factors that affect the success of inclusive education of students with autism spectrum disorder (ASD) include providing school-based support that addresses individual needs, training key stakeholders, and improving people's attitude and acceptance. JC A-Connect: Jockey Club Autism Support Network promotes the non-governmental organisation (NGO)–

school collaboration model and provides evidence-based training and support to professionals in NGOs and schools to support students with ASD. Many caregivers of children with ASD have additional parenting stress but with training, they can be great working partners in helping their children. This project has adapted the World Health Organization's Caregivers Skills Training (CST) programme that aims to promote task-sharing of helping children with ASD. To enhance the public's understanding towards ASD, the Public Education Team has initiated various awareness activities in the community.

The most significant impact of this project is that starting from 2021, the Education Bureau (EDB) will adopt the School Support Team's NGO–school collaboration model and provide an additional HK\$62 million a year for small group training for students with ASD in mainstream schools.

Dr Kathy Wong and Dr Paul Wai Ching Wong received the Faculty KE Award 2020 of the Faculty of Social Sciences. More details are at [Annex I-B](#).

1.3 [Impact Project Funding Scheme](#)

The University continued to run the annual Impact Project Funding Scheme in 2020/21, which has become an important enabler for academic staff to benefit the broader community with their expert knowledge and research. In the reporting year, 122 proposals were received, of which 58 were supported. The maximum

amount for each Impact Project bid was raised from HK\$100,000 to HK\$150,000 starting from the 2020/21 exercise, and proposals are considered on a competitive basis. The list of the projects supported is available at the KEO website at www.ke.hku.hk/assets/doc/Impact Project Summary 202021 online eng.pdf. Two funded projects are highlighted below.

“Keep on Talking and Eating”: Impact on the community



The Swallowing Research Laboratory conducted a series of KE projects under the theme of "Keep on Talking and Eating" (KOTE) since 2016. The KOTE projects aimed to promote public awareness in swallowing safety and management, especially in the elderly population. The projects involved providing educational seminars, workshops, mobile application, and website to individuals with swallowing difficulties, healthcare workers, health professionals and carers. Led Dr Chan Karen Man Kei, the project collected evidence on the impact of the KOTE projects on patients, related NGOs and health professionals. The findings would inform future research and KE directions.

A Book to Empower Allergy Patients in Hong Kong - “Living with Allergies”

HKU's Department of Medicine is the only academic unit in Hong Kong with specialist care, teaching and research in allergy for adult patients. The Department has conducted voluminous and pioneering allergy studies in Asia and continues to advocate allergy awareness in Hong Kong.

Over the years, many tragedies occurred among patients suffering from chronic allergies with no help readily available. This project aimed to empower and support allergy patients to manage their own allergic conditions by publication of a doctor-patient collaborative self-help book.

In collaboration with both the Hong Kong Institute of Allergy (a professional body of allergy professionals) and Hong Kong Allergy Association (a patient support group), Dr Philip Li has taken the lead to author this seminal publication by amalgamating the expertise and wisdom from various allergy professionals and experienced patient/carers. Essential information and practical tips to empower patient self-care will be published both as a printed book and an electronic one. This book will be unique in providing both doctor and patient perspectives. The project will raise awareness of various allergic conditions relevant to Hong Kong as well as foster self-management of allergic conditions for of allergy patients in future.

2. TECHNOLOGY TRANSFER AND PARTNERSHIPS WITH INDUSTRY

The Technology Transfer Office (TTO) has had active participation in technology transfer activities in order to promote and market HKU's impactful research inventions. To develop close ties with HKU research community and the industry while assisting the community in a smooth transition from research to commercialisation, TTO offers unbridled perspective on questions pertinent to marketability, funding sources, industrial partners, patenting and other intellectual property issues, new business start-ups, HKU policies and procedures, and more.

2.1 Events and Promotions

Technology Transfer Primer Webinar Series

Technology Transfer Primer is a webinar series hosted by the TTO. The overarching goal is to provide HKU's principal investigators (PIs) and start-up cofounders with practical and valuable insights into growing their business. The first webinar launched successfully in October 2020 and became a regular event since then. Through congregating in hybrid meetings, participants are able to acquire fundamental know-how of the technology transfer process and sail through their challenging yet rewarding entrepreneurial journeys. In addition, TTO also invited speakers to share their technology transfer success stories. The Primer webinar engaged approximately 1,000 participants from the industry, HKU community and government departments, and received very positive feedback from the participants.



HKUTTO X TUSPARK HK: Greater Bay Area Seminars

In January 2021, TTO co-organised an online seminar series with TUSPARK HK. This virtual seminar series invited thought leaders to share about the hottest topics in the Greater Bay Area, covering technology commercialisation opportunities, start-up ecosystem & funding opportunities, and I&T government policy in Shenzhen and Guangzhou. Over 250 audiences participated in the seminars and interacted with the speakers.



Virtual InnoCarnival 2020

The virtual InnoCarnival 2020, organised by the Innovation and Technology Commission (ITC) of the HKSAR Government, took place online in December 2020. Themed “Collaborate · Innovate · Beyond Imagination”, The nine-day virtual carnival attracted over 80,000 views.

Six novel HKU inventions were exhibited:

- A Portable 3D-printed microfluidic biosensor for accurate, affordable malaria diagnosis
- Generation of live attenuated influenza vaccine with avian codon usage bias
- Real-time surface shape sensing for soft and flexible structures using fiber bragg gratings
- Innovative paper-based aluminum-air batteries
- IP00946 mobile SARS-Cov-2 detection/ COVID-19 diagnostic Assay
- Novel aptamer-enable DNA nanostructures for targeted drug delivery

HKUTTO TechShow 2021

In order to enhance HKU community & the public's interest and understanding of HKU's I&T, TTO has launched its first-ever virtual exhibition, namely HKUTTO Techshow 2021. The exhibition started from 19th April 2020 and lasted for a month. Over 120 cutting edge HKU technologies were showcased. TTO also invited HKU start-ups (TSSSU@HKU awardees and iDendron team) to exhibit their technology in the techshow. The show has successfully engaged visitors from different sectors and industries, including government departments, HKU community, alumni, other universities, investors, etc. The total number of views has reached 30,000.



Public Relations

TTO maintains excellent relationship with media and has secured over 10 one-on-one media interviews with HKU start-up cofounders and PIs, with channels covering television, online and printed newspapers. The media interviews immediately aroused public awareness of HKU's latest I&T projects and at the same time maximised the exposure of both TTO and HKU start-up companies.

AI分析肢體動作 減低漏改善運動姿勢

【本報訊】香港大學工程學院（HKU）與香港大學醫學院（HKU）合作，開發出一套AI系統，能即時分析運動員的肢體動作，並提供即時反饋，以改善其運動姿勢，從而減少運動傷害。該系統名為「AI Motion Analysis System」，由香港大學工程學院的教授及學生開發。

該系統利用AI技術，能即時分析運動員的肢體動作，並提供即時反饋，以改善其運動姿勢，從而減少運動傷害。該系統名為「AI Motion Analysis System」，由香港大學工程學院的教授及學生開發。

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學界技術商業化 國泰港鐵採用 本地沉浸式VR助企業培訓

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TTO Publication

A monthly newsletter, known as TTO Techxfer, has been published since 2020. Twelve consecutive issues of Techxfer have been published and have become one of the most important communication channels of TTO. Each issue is distributed to at least 30,000 target audiences through TTO's eDM mailing list, website, TTO's social media channels (LinkedIn, Facebook and WeChat) and HKU internal bulk email system.

Techxfer is also an essential tool to share featured HKU technology and its milestone, as well as to elucidate how TTO facilitates PIs in the project. It also emphasises the fruitful commercialisation result through TTO's recent events & news, monthly patents filing record and the technology commercialisation report. We aim to motivate HKU's PIs to submit more inventions and, as a result, to commercialise the latest technologies hand-in-hand with TTO.

2.2 Innovative Sewage Testing Tool for SARS-CoV-2 and its Variants

Testing of SARS-CoV-2 virus in the sewage is one of the key techniques to detect and fight the virus because it helps detect the 'silent carriers' or people who are asymptomatic by monitoring virus levels in sewage before a catastrophic

community outbreak takes place. While the world was greatly hampered by the COVID-19 Pandemic in 2020 and 2021, there is no standard nor a reproducible method for assessing the virus in sewage. However, a cross-disciplinary research team led by Professor Tong Zhang of the Department of Civil Engineering at HKU is showing promising results that could help turn the tide. The research on sewage testing of SARS-CoV-2 virus received funding by the Hong Kong SAR Government and has started since July 2020 in HKU. The method developed by the team contains a two-step separation and seeks to detect the two gene segments of the SARS-CoV-2 virus for determining the presence of SARS-CoV-2 in sewage. Since October 2020, Professor Zhang's team has collected over 1100 samples from different sewage collection systems, conducted a series of nucleic acid tests, and uncovered over 50 hidden COVID-19 cases in the community that would have otherwise gone unnoticed.

TTO coordinated the patent filing and commercialisation of this new sewage testing method. The new method has been successfully licensed to and deployed by a number of local testing laboratories which are now helping the HK Government to contain the pandemic by monitoring the sewage in various locations of Hong Kong.

After the commercial adoption, the research team continued the research and has successfully enhanced the method which can also identify COVID-19 variants in sewage now. The enhanced testing method was earlier applied in testing a sewage sample collected on May 2, 2021 from a building in Chai Wan and successfully identified positive signals of N501Y and other mutations of the Beta variant (known as B.1.351, first identified in South Africa). A positive case involving the COVID-19 mutant was later confirmed on May 7, 2021 in the same location.

The new testing method has proved to be a vital relief to the public-health system in Hong Kong, with enormous potential to close the possibility of more cases spreading undetected or future flare-ups. The team envisages to develop a full-fledged surveillance system which could safeguard millions of lives.



The Chief Executive Carrie Lam (centre) visited the laboratories of HKU on 15 February 2021 to receive a briefing on the sewage testing work

2.3 HKU's Flu-based COVID19 vaccine entered clinical trials in Mainland and Hong Kong

The HKU team led by Professor Honglin Chen, alongside team members Dr. Pui Wang, Professor Zhiwei Chen and Professor Kwok-Yung Yuen, made a SARS-CoV-2 vaccine candidate based on a previously established flu-based DelNS1 live attenuated influenza virus (LAIV) platform. TTO worked with Professor Chen to structure the collaboration and settle relevant agreements with Wantai Biopharm for pre-clinical studies and clinical development. With the launch of the phase I clinical trial by Wantai in Mainland in September 2020, HKU's vaccine became the world's first nasal spray vaccine for COVID19 in human trial. Up to now, Wantai has completed both phase I and phase II clinical trials in Mainland. Meanwhile, HKU research team worked with HKU Clinical Trial Centre and started a phase I clinical trial in Hong Kong in March 2021. TTO facilitated the conclusion of the funding agreement with Coalition for Epidemic Preparedness Innovations (CEPI), which allowed the HKU team to receive US\$4.89M for the production of clinical trial materials, and the investigation of mucosal immune responses during the phase I clinical trial.

2.4 Special Edition 2021 International Exhibition of Inventions of Geneva

The International Exhibition of Inventions of Geneva ("IEIG") held annually in Switzerland is recognized as one of the most prestigious innovation exhibitions. This year, the organizers of the International Exhibition of Inventions of Geneva have decided to host a special virtual-only edition in 2021: Inventions Geneva Evaluation Days – Virtual Event ("IEIG Special Edition"). Inventors from all over the world participated in this year IEIG Special Edition by presenting their invention via a 3-minute video that will be judged by a panel of professional judges.

TTO coordinated HKU's participation at the IEIG Special Edition and won 11 gold and silver medals at this IEIG Special Edition with 7 from the Faculty of Engineering, 2 from the LKS Faculty of Medicine and one each from the Faculty of Science and the Faculty of Architecture. About 600 inventions from 20 countries were evaluated in the competition, which is one of the most important global annual events exclusively for inventions. The University's "Flu-based COVID-19 Vaccine" was awarded the prestigious Gold Medal with Congratulations of the Jury. The HKU winning teams were congratulated by Chief Executive Carrie Lam at the CE's Reception held in May 2021.

2.5 Gold Medal with Congratulations of the Jury – Flu-based COVID-19 Vaccine

This is the first nasal spray vaccine for COVID-19 in clinical trial, which is based on a unique live attenuated flu vaccine technology platform (DelNS1 LAIV). It

expresses a specific antigen to induce immunity targeting the critical element of the Receptor Binding Domain (RBD) of SARS-CoV-2. . This flu-based COVID-19 vaccine was developed by the research team led by Professor Honglin Chen, Dr Pui Wang, Professor Zhiwei Chen and Professor Kwok-Yung Yuen from the Department of Microbiology, Faculty of Medicine of HKU.



Dr. Yiwu He, Chief Innovation Officer & Senior Advisor to the President, HKU and Professor Chen Honglin, Gold Medal with Congratulations of the Jury Awardee introduced the Flu-based COVID-19 Vaccine to the Chief Executive Carrie Lam, Swiss Consul-General in Hong Kong Rolf Frei and Secretary for Innovation & Technology Alfred Sit.

2.6 Industry Engagement

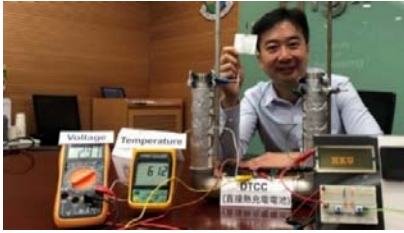
The series of HKU-Industry Forum continued even though some of them have been switched to online mode in light of the current border control and social distancing measures imposed due to COVID-19 pandemic control. Over the reporting period TTO organized dozens of industry engagement seminars, meetings and laboratory visits where leading industry companies like ASM Pacific Technology, Biel Crystal Manufactory, China Mobile and Defond, to name a few, took the opportunity to meet and engage in deep discussions with HKU researchers and spinoff companies and explored research collaborations. TTO followed up with the discussions and supported the industry companies in setting up the subsequent research collaborations with them.

2.7 Entrepreneurship Development

Five HKU Spinoff companies received recognitions and accolades at the Special Edition 2021 International Exhibition of Inventions of Geneva:

High Performance Solution

The Direct Thermal Charging Cell (DTCC) of High Performance Solution Limited ("HPS") is a novel invention for converting low-grade heat to electricity under isothermal operation, surpassing all existing types of thermoelectrochemical systems. HPS won a Gold Medal at the IEIG Special Edition 2021. The company was founded by Dr Tony Shien-Ping Feng of the Department of Mechanical Engineering, Faculty of Engineering of HKU.



Dr Tony Shien-Ping Feng of the Department of Mechanical Engineering, HKU

Momentum Robotics

The MR-safe Actuator of Momentum Robotics Limited (“Momentum”) comprises a robust set of magnetic resonance imaging (MRI)-safe hydraulic motors and custom robotic systems for use within the magnetic resonance imaging (MRI) environment. The technology allows efficient power transmission to robotic components between the MRI room and the control room over a distance of up to 10m, allowing completely safe operations in the MRI. Momentum won a Silver Medal at the IEIG Special Edition 2021. The company was co-founded by Dr Ka-Wai Kwok, Dr Guo Ziyang, Dr Dong Ziyang, Dr Lee Kit Hang Brian, Mr Ho Justin Di-lang and Mr Tang Wai Lun from the Department of Mechanical Engineering, Faculty of Engineering of HKU.



Dr Ka Wai Kwok (Middle), Associate Professor in the Department of Mechanical Engineering, HKU, with team members, Justin Ho (left) and Alan Tang (right)

Llewellyn and Partners

The BIM Warehouse of Llewellyn and Partners Company Limited (“LPC”) formulates a new AEC business model. It is a B2B2C e-warehouse and e-commerce platform to house AEC assets within an ISO-compliant asset information management platform (AutoCDE) that integrates BIM, GIS, IoT, A.I. and Blockchain. It’s A.I. functionality (AutoBIM) can generate semantic 3D BIM model. Powered by its blockchain (AEC2hain), it is a solution to the tokenisation for AEC and real estate. BIM Warehouse optimises the processes and unifying supply chain of the industry for higher cost efficiency and security. It empowers the industry for the new construction normal digitalisation, standardisation, integration and industrialisation. LPC won a Silver Medal at the IEIG Special Edition 2021. The company was founded by Ir Dr Llewellyn Tang Chun Ming from the Department of Real Estate and Construction, Faculty of Architecture of HKU.



Ir Dr Llewellyn Tang (right), Associate Professor of the Department of Real Estate and Construction, Faculty of Architecture, HKU (Photo courtesy of Ming Pao)

Hydrosoft

The Soft Underwater Manipulation System of Hydrosoft Limited (“Hydrosoft”) is a dexterous soft underwater manipulation system for general underwater work purposes. It has four innovative features including zero weight-in-water, ambient water pressure independence, embedded waterproofing sensors and cost-effectiveness for underwater intervention applications. Hydrosoft won a Silver Medal at the IEIG Special Edition 2021. The company was founded by Dr Shen Zhong of the Department of Mechanical Engineering, Faculty of Engineering of HKU.



MetTactics

MetTactics is a new start-up founded by Prof. Alice Wong from School of Biological Sciences, Faculty of Science of HKU. The company provides a precisely controlled miniature microfluidic setup for rapid capture of metastatic cancer cells, serving as excellent model for anti-metastatic drug screening. The key technology of the company is the unique microfluidic chip that recreates human body internal cavity (peritoneal cavity) environment to model cancer cells in metastatic state. The chip is able to capture the metastatic colonizing cancer cells, a special subpopulation accounting for around 0.1% of the tumor mass. The technology won a Silver Medal at the IEIG Special Edition 2021.

2.8 [TSSSU@HKU](#)

After 6 years of operation, we conducted a review on the operation of the TSSSU@HKU program this year and have made a number of new arrangements to further streamline the selection and vetting process as well as to provide bigger support to the impactful teams. A strategic, two-tier award allocation scheme has

been devised for the allocation of the HK\$8M funding. HK\$5M was set aside for the Grand Awards which the best 5 teams each received a significant funding support of HK\$1M. The other HK\$3M went to the Seed Fund Awards for assisting another 12-15 teams with good potential to get off the ground. As a result, a total of 17 teams received the TSSSU@HKU Awards for FY2021/22 and the following 5 teams received the Grand Awards:

Company Name	Category	Description
MetTactics Limited	Biotech	Provision of a precise microfluidic chip that for modelling cancer cells in metastatic state
GoldPorph Pharma Limited	Biotech	Provision of gold porphyrin-based anticancer drugs
Interlitho Technology Limited	Advanced Materials	Provision of interference lithography patterning equipment
Hollo Limited	Artificial Intelligence	Provision of a mental health management app
Momentum Robotics Limited	Robotics	Provision of MRI-compatible medical robots

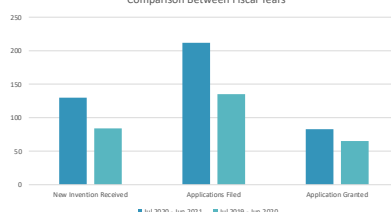
2.9 Achievements in Patent Prosecution

From July 2019 – June 2020 to July 2020 – June 2021, there has been a significant increase in all three categories of the university's patent portfolio: new inventions disclosed; patent applications filed; and patents granted (**see the chart in the next page**). Specifically, TTO Intellectual Property Management (IPM) team has handled 130 new inventions that were disclosed by the inventors to the university, compared with 84 in the last year, which is 54.8% increase. In addition, the IPM team has filed 212 patent applications, compared with 135 in the last year, which is 57% increase. Lastly, 83 patents have been granted, compared with 65 in the last year, which is 27.7% increase. These achievements demonstrate the increasing strength of the university's innovation, growing awareness of the university researchers in IP protection, and TTO's commitment and professionalism in protecting university's intellectual property rights.

IPM Statistic

	New Invention Received	Applications Filed	Application Granted
Jul 2020 – Jun 2021	130	212	83
Jul 2019 – Jun 2020	84	135	65
Percentage of Increase	54.8%	57%	27.7%

Comparison Between Fiscal Years



3. FOSTERING INNOVATION AND ENTREPRENEURSHIP

3.1 iDendron

iDendron is the Innovation & Entrepreneurship Hub of HKU with the aim to promote the innovation & entrepreneurship culture through inter-disciplinary education and support the HKU early stage startups. We have different programs to cater needs of startups in different stages and education initiatives to promote entrepreneurial and innovative spirits on campus.

Entrepreneurship Academy



The workshop series covered a range of topics at the core of entrepreneurship, focusing on integrating information and ideas from multiple perspectives in order to help participants recognize and gauge the critical factors in the commercialisation process of innovations. The workshop aims to equip motivated HKU members with basic business knowledge and skills. Over 500 HKU members and friends of HKU registered and participated in this FREE ten-week workshop.



Incubation Programme

The iDendron Incubation Programme is a 6-month programme designed to accelerate the growth of high potential HKU startups through mentorship, investor relation building and exposure outreaching. Last year, the programme has incubated over 20 HKU startups, with nearly 90% of them still in business. The number of applications for the latest cohort increased by 400%, which shows

that the programme is gaining traction and has become a flagship programme of HKU iDendron.

In Jan 2020, we led a delegation of iDendron incubatees, iDendron members, HKU students and alumni to Bangkok to explore Thailand's startup ecosystem and get connected with the key players in the local startup scene. During the 3-day entrepreneurship trip, iDendron hosted over 10 events and invited over 30 investors & entrepreneurs to share with insights with our participants.



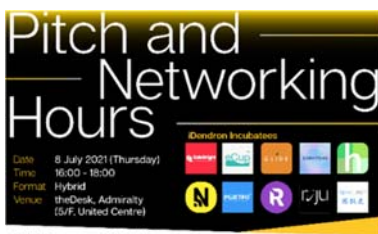
Mentors Days to match the incubates and mentors

To encourage knowledge sharing among iDendron incubatees, we hosted 20+ Founders Meetup and workshops. Topics include UX/UI, SEO, design thinking, product growth, pitching skills, fundraising strategy, financial metrics, international expansion and public relations. One of the new initiatives that we launched for cohort 3 incubatees is the usability testing sessions. We invited 20+ industry experts and startup mentors to help improve our teams' products.



Monthly Founders Meetup for progress sharing and knowledge exchange

iDendron also work closely with HKU startup founders to accelerate their fundraising process by making introductions to angel investors and venture capitalists. One of the cohort 3 incubatees recently raised HKD2M at a valuation of HKD80M through iDendron's Investor Network.



Pitching and Networking with investors for investment opportunities

In 2020/2021, iDendron incubates have received over 50 media coverage and won over 10 awards. Recently, iDendron has launched the Founder Stories series, an interview series featuring the personal and professional journeys of iDendron incubatees. (<https://idendron.hku.hk/founders-stories/>)



Workshops with startup experts for product testing and improvement



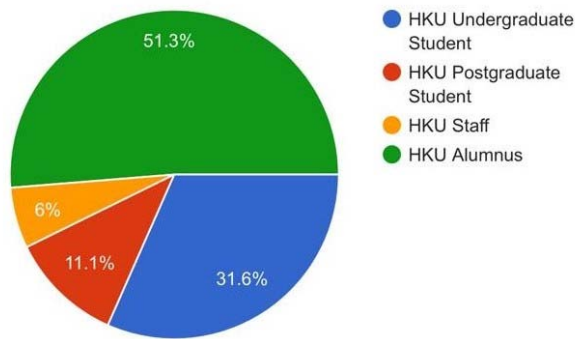
UI/UX workshops conducted by Keith Li, Founder of Innopage

SEED Programme



SEED Programme supports early-stage startup projects initiated by HKU Students, Alumni and Staff with co-working spaces, trainings, supportive network, HKD100,000 seed fund for each team from Hong Kong Science & Technology Park and AWS cloud services credits.

Applications from 120 teams with a total of 480 applicants were received. 20 awardees were selected and admitted HKSTP STEP Programme, with a HK\$100,000 seed funding (See team list: <https://bit.ly/3jMaPpU>)



Compositions of applicants of SEED Programme



Mixer event of SEED Programme 2021 Batch 1

Gear Up – GBA Seed Fund and Incubation Programme



iDendron is the Grantee of the “Funding Scheme for Youth Entrepreneurship in the Guangdong-Hong Kong-Macao Greater Bay Area”, funded by The Youth Development Commission. “Gear Up Startup Seed Fund & Incubation Programme” aims to provide entrepreneurial support and incubation services that befit the needs of young people who are about to start their businesses, helping them to turn ideas into reality. Winning teams will be awarded up to HK\$600K Seed Fund, together with other entrepreneurial support and incubation services.



Workshops with speakers with startup experiences at Greater Bay Area

Student Competitions

iDendron supports various entrepreneurial student competitions organised by student societies (e.g. Hult Prize, AIESEC) and external organisations (e.g. Hong Kong New Gen Cultural Association, HKSTP).



Hult Prize 2021

Over 36 teams from different Universities in 15 countries participated in the preliminary round, from which the Top 6 went on to compete in the grand finale. The winner of Hult Prize@HKU, Team Edillery has been invited to attend the Hult Prize Start-up Accelerator, to be held this summer at Ashridge Castle in England, competing with regional winners from across the world for the US\$1M Dollar Grant.



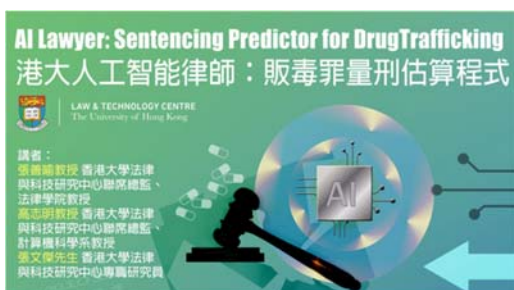
The 7th Hong Kong University Student Innovation & Entrepreneurship Competition

This year, HKU has the highest number of winning teams (20 out of 51 winners) compared with other local universities and institutions this year (CUHK: 15 winners, HKUST: 10 winners). iDendron Incubatee Hollo also won the champion in the track of social innovation. (Full winners list: <https://bit.ly/3he8gvd>)

4. COMMITMENT TO KNOWLEDGE ACCESS AND COMMUNITY ENGAGEMENT

4.1 Faculties' Core Activity

All faculties are committed to public engagement to share knowledge and raise awareness on important issues facing society. Various activities were conducted in 2020/21, including public seminars, press briefings, conferences, publications on mass media, international competitions, and two-way KE through new media such as online social media platforms. For example, the Faculty of Law organised a number of public KE lectures and seminars covering topics such as HKU AI lawyer, financial law on the digital assets in HK, gender-based violence and equality rights



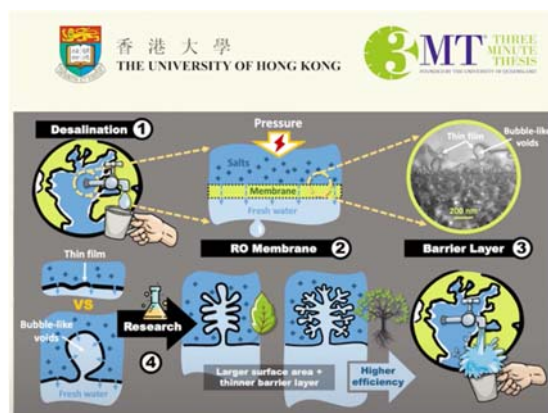
Community engagement, as well as collaboration with community partners, continued to be an important component in the KE programmes of the Faculties. While some KE activities had been put on hold due to COVID-19, many of the engagement projects had continued through different forms such as online webinars.

4.2 Strengthening Research Communication Skills for RPg Students

Virtual HKU Three Minute Thesis (3MT) Competition 2021

The 3MT concept was first conceived by the University of Queensland. Many leading universities around the world have subsequently espoused this practice to promote KE, especially among young people. Since 2011, KEO and Graduate School of HKU have jointly organised the annual 3MT Competition, challenging final year research postgraduate students to explain their research within 3 minutes to a general audience.

In view of the COVID-19 pandemic, increasing social distancing measures and restrictions on public gatherings and travel, HKU 3MT 2021 was hosted in a virtual format (video submission) from April to June 2021. The winner of the HKU 3MT Competition will represent HKU in the Asia-Pacific 3MT Competition in October 2021. As one of the key measures to entrench the culture of KE in HKU, the 3MT Competition continued to be well-received in 2020/21.



5. LOOKING AHEAD

As the world is slowly but steadily emerging from the depths and ravages of the COVID-19 pandemic, countries worldwide have witnessed how relentless collaboration between universities and the communities has helped the human race fight the marauding pandemic: from the mammoth task of public health education to the research and development of vaccines in an unprecedented pace with state-of-the-art technologies. Effective KE, not least seamless technology transfer between universities and the industries, are among the crucial elements that underpin the efforts.

Bringing research outcomes and technological advancements to benefit societal and economic development is an integral part of HKU's mission. Looking forward, HKU is committed to building both the vertical and horizontal ecosystems to bring together the different talents and participants needed to ripple the benefits of research out of laboratories and into the community. HKU will seek to create and support a vibrant community of researchers, developers, patent experts, regulatory experts, marketing and industry experts and others, with the conviction that the best way to achieve success is to let the best people rub shoulders and work together. On top of the current community partners such as non-governmental organisations, networks will also be created with businesses.

The KEO will be reinforced with the appointment of three new Associate Directors with effect from July 1, 2021. The increase in the number of Associate Directors from one to three signifies the importance attached by HKU to KE. It will also draw in expertise and leadership from a broader spectrum of disciplines to plan and guide KE initiatives.

With the new Associate Directors on board under the guidance of Dr Yiwu He, the KEO will explore and formulate new KE initiatives to bring HKU's KE work to new heights. To this end, we will build up network with new KE partners around the world in order to learn about the best practices and latest trends. We will conduct surveys to collect views and suggestions on ways to enhance KE work within and the beyond the doors of HKU. We will also train our eyes on the goal of advancing KE and ensure cost-effectiveness and impact of our KE initiatives.

TTO will also continue to help build the vertical and horizontal ecosystems. It will establish the HKU Entrepreneurship Investment Fund to unleash the translational potential of innovation, science and technology for HKU. It will not only support technology entrepreneurship and growth of start-up ventures, but also catalyse the constellation of more resources and opportunities both in Guangdong-Hong Kong-Macau Greater Bay Area and globally.

In the coming year, we will also work with venture capital funds; and support the licensing of technologies for commercialisation. Our work to foster innovation and entrepreneurship will extend to and capitalise on the burgeoning development of the Guangdong-Hong Kong-Macao Greater Bay Area. With funding granted by the “Funding Scheme for Youth Entrepreneurship in the Guangdong-Hong Kong-Macao Greater Bay Area” of The Youth Development Commission, iDendron has launched the new “Gear Up Startup Seed Fund & Incubation Programme” to provide entrepreneurial support and incubation services that befit the needs of young people who are about to start their businesses, helping them turn ideas into reality.

Looking ahead, iDendron will also work closely with the Tam Wing Fan Innovation Wing of the Faculty of Engineering to create synergy in entrepreneurship. It will also expand the scope of support to cover entrepreneurs and innovators in the life science discipline.

The University of Hong Kong
July 31, 2021

University: The University of Hong Kong (HKU)
Faculty: School of Public Health, LKS Faculty of Medicine
Title of case study: Combating COVID-19 through Knowledge Exchange
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>The world is facing an unprecedented threat from the COVID-19 in 2020. As a leading research and education hub in public health in Asia, the School of Public Health is very actively contributing to the COVID-19 response in multiple areas such as research; policy guidance; media communication; and public education.</p> <p>Our research findings have facilitated the formulation of evidence-based public health policies on COVID-19. Advice from our experts have informed the pandemic intervention strategies of Hong Kong Special Administrative Region (HKSAR) Government and various professional bodies. Local, mainland and international media has reported our findings extensively, and our public education via various channels has built health literacy among the public.</p> <p>Through knowledge exchange in two-pronged approaches – from top-down (influencing policymakers) to bottom-up (heightening awareness among the public), and by utilising the role of media as a bridge of communication between policymakers and the society, the School of Public Health contributed to keeping COVID-19 under restraint in Hong Kong and sharing our experience and good practices with the global community.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>Since the outbreak, our research teams have been exploring the science of the virus, its detection, epidemiology, prevention and health policy interventions. The research findings have provided solid ground for policy decisions and public education. The foci of each of the research teams are listed as follows:</p> <p><u>(a) Public Health Lab Sciences team (including HKU-Pasteur Research Pole)</u></p> <ul style="list-style-type: none"> i) Serving as a WHO reference laboratory for COVID-19 diagnostics ii) Developing diagnostic tests for detecting SARS-CoV-2 virus RNA by RT-PCR; antibodies to SARS-CoV-2; T cell immune responses to SARS-CoV; and characterization of COVID-19 patients iii) Facilitating SARS-CoV-2 vaccine development based on basic virology work iv) Understanding the kinetics of the viral load and immune response to SARS-CoV-2; the cell types in the lung and human respiratory tract that are susceptible to infection; and host responses in COVID-19 patients v) Carrying out population based sero-epidemiological studies to define the age specific attack rates of SARS-CoV-2 infection in the community in Hong Kong vi) Defining the correlates of protection against SARS-CoV-2 vii) Developing experimental animal models to study the pathogenesis and immunity to SARS-CoV-2 and to use them to study vaccines and therapeutic antibodies viii) First reporting that SARS-CoV-2 can transmit to pet animals (dogs and cats) <p><u>(b) Infectious Disease Epidemiology team</u></p> <ul style="list-style-type: none"> i) Investigating the epidemiology of COVID-19; its disease severity, transmission and transmission dynamics, public health impact and developing optimal control measures ii) Developing mathematical models to study the spatial and temporal dynamics of

<ul style="list-style-type: none"> iii) iv) v) <p>(c)</p> <ul style="list-style-type: none"> i) ii) iii) iv) <p>(d)</p> <ul style="list-style-type: none"> i) ii) iii) iv) 	<p>transmissibility of SARS-CoV-2</p> <p>Using the dynamic transmission model to estimate the clinical severity of SARS-CoV-2 during early outbreak of Wuhan and mainland China; to nowcast the spread of COVID-19 via transportation network within mainland China and via air network worldwide; and to estimate the effects of non-pharmaceutical interventions</p> <p>Real-time estimation of COVID-19 transmissibility with the digital mobility data generated by mobile phone usage or app use, and estimate the risk of second waves given the relaxation of NPIs such as lockdowns</p> <p>Estimating the additional disease burden resulting from the suspension of medical services</p> <p><u>Health Economics, Policy and Management team</u></p> <p>Understanding compliance with the International Health Regulations</p> <p>Investigating and mitigating the gendered effects of COVID-19 in Hong Kong, Canada, Australia, China, and the UK</p> <p>Understanding gendered effects of COVID-19 in low-income countries using a mixed-method study methodology</p> <p>Measuring secondary effects of COVID-19 outbreak and response on routine health services in the Democratic Republic of the Congo</p> <p><u>Population Mental Wellness team</u></p> <p>Providing real-time population data on psychobehavioural responses including adherence to preventive and social distancing behaviours</p> <p>Examining temporal evolution of anxiety, depression, and population well-being, in relation to COVID-19 using a 10-year prospective population-representative cohort and big data (e.g. social media) and identifying modifiable risk factors for mitigating strategies</p> <p>Assessing whether infection control practices routinely implemented in clinical settings due to COVID-19 are evidence-based</p> <p>Assessing community interventions in mitigating the impact of COVID-19</p> <p>3. References to the research (indicative maximum of six references)</p> <ul style="list-style-type: none"> i) Sin Fun Sia, Li-Meng Yan, Alex WH Chin, Kevin Fung, Ka-Tim Choy, Alvina YL Wong, Prathanporn Kaewpreedee, Ranawaka APM Perera, Poon LLM, Nicholls JM, Peiris M, Yen HL. Pathogenesis and transmission of SARS-CoV-2 in golden Syrian hamsters. <i>Nature</i>. https://doi.org/10.1038/s41586-020-2342-5 ii) He X., Lau E.H.Y., Wu P., Deng X., Wang J., Hao X., Lau Y.C., Wong Y.T., Guan Y., Tan X., Mo X., Chen Y., Liao B., Chen W., Hu F., Zhang Q., Zhong M., Wu Y., Zhao L., Zhang F., Cowling B.J., Li F. and Leung G.M. Temporal dynamics in viral shedding and transmissibility of COVID-19. <i>Nature Medicine</i> DOI: 10.1038/s41591-020-0869-5 iii) Leung N.H.L., Chu D.K.W., Shiu E.Y.C., Chan K.H. Chan, McDevitt J.J., Hau B.J.P., Yen H.L., Li Y.G., Ip D.K.M., Peiris J.S.M., Seto W.H., Leung G.M., Milton D.K. and Cowling B.J. Respiratory virus shedding in exhaled breath and efficacy of face masks. <i>Nature Medicine</i> DOI: 10.21203/rs.3.rs-16836/v1 iv) Lam T.T., Shum M.H., Zhu H., Tong Y., Ni X., Liao Y., Wei W., Cheung W.Y., Li W., Li L., Leung G.M., Holmes E.C., Hu Y., Guan Y. Identifying SARS-CoV-2 related coronaviruses in Malayan pangolins <i>Nature</i> DOI: 10.1038/s41586-020-2169-0 v) Wu JT, Leung K, Bushman M, Kishore N, Niehus R, de Salazar PM, Cowling BJ, Lipsitch M, Leung GM. Estimating clinical severity of COVID-19 from the transmission dynamics in Wuhan, China. <i>Nature Medicine</i>. 2020 Apr;26(4):506-10. vi) Wu JT, Leung K, Leung GM. Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. <i>Lancet</i>. 2020 Feb 29;395(10225):689-97
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A total of 38 publications have been published. The full list is available at [Reference 1](#).

4. Details of the impact (indicative maximum 750 words)

Since the COVID-19 outbreak, the School of Public Health has been working tirelessly to share and transfer knowledge based on evidence-based scientific research by means of policy guidance, media communication and public education.

Our research findings and expert advice influenced policymakers to plan and implement pandemic intervention policies from a top-down approach, while we raised public awareness through media and a public awareness campaign. This eventually contributed substantially to the effectiveness of the government containment measures. The two-pronged approach helped the city escape large-scale outbreaks and keep COVID-19 under restraint in Hong Kong.

Expert advice from the School influencing pandemic policy strategies

The impact has been evidenced by the HKSAR Government and professional bodies drawing on our research and expert advice to guide their pandemic policy formation and interventions.

The Chief Executive, Mrs Carrie Lam, appointed four experts with rich experience in public health, epidemiology and clinical aspects to join an expert advisory group to provide professional advice to the Chief Executive and the HKSAR Government. Among the four experts, two are from the School of Public Health. They are: Professor Gabriel Leung, Dean of HKU LKS Faculty of Medicine; and Professor Keiji Fukuda, Director and Clinical Professor of the School of Public Health and former Assistant Director General of the World Health Organization. Their expertise and field experiences assisted the Government in planning and implementing measures such as border control, the shutdown of high-risk areas, social distancing restrictions, preventive measures on high-risk groups, extensive contact tracing and case isolation. [\[Source 1\]](#)

Moreover, experts at the School of Public Health provided advice to business corporations and professional bodies in forms of seminars, webinars and private consultations to facilitate timely business and strategic decisions based on the evolving situation. These included, Hong Kong General Chamber of Commerce, the American Chamber of Commerce in Hong Kong, the Foreign Correspondents' Club, Asia Society Hong Kong Center, the Executive Forum, UC Berkeley, Barclays, etc. [\[Source 2\]](#)

Media as an important medium to raise public health awareness

Simplified understandings of disease epidemiology and the provision of prompt, accurate information through media soundbites may influence individuals' risk perception, discern rumours, raise public awareness and in turn shapes the evolution of the outbreak. Experts at the School of Public Health accepted a significant number of interviews from local, mainland and international news outlets since the COVID-19 outbreak. The interviews and soundbites were covered by over 1,800 articles and filmed news items from January to May 2020.

Furthermore, journalists covering the COVID-19 pandemic were invited to join a 3-hour online workshop on 31 March 2020. Jointly hosted by COVID-19 experts of the School and media experts from HKU Journalism and Media Studies Centre, the workshop received overwhelming responses. Journalists were acquired with health knowledge in infectious diseases, and were provided with basic tools and background knowledge to help them in delivering accurate messages to the public. [\[Source 3\]](#)

A public awareness campaign as a bottom-up approach against COVID-19

The School of Public Health brought together a wide array of partners and resources on a series

of engaging initiatives to educate students and the public with knowledge related to the coronavirus. Details are as follows:

- **COVID-19 webpage** (<https://covid19.sph.hku.hk/>): Developed by the WHO Collaborating Centre for Infectious Disease Epidemiology and Control hosted by the School of Public Health, the webpage served as a platform to share the latest scientific findings and the implications for evidence-based public health policies on COVID-19. [Source 4]
- **“Voices from the COVID-19 Frontlines” video series**: Developed by the School of Public Health, the video series featured stories of our internationally renowned scientists, educator and health economist, and was publicised on YouTube, HKU U-Vision, HKU bulk email and various social media platforms. It allowed the public to get to know more about their career journeys in public health and their latest work in the fight against COVID-19. [Source 5]
- **Live dialogues series**: Members of the School were invited to share their insights into public health policies, health diplomacy and health education based on their experiences in global outbreaks. The global live sessions were open to the public via HKU Fight COVID-19 website, and questions were taken from around the world. The series was publicised extensively by the HKU community via various social media platforms. [Source 6 & 8]
- **#askHKUMed** (<https://www.med.hku.hk/en/covid-19/askhkumed>): Experts from our School were invited to answer questions submitted by the public about the COVID-19 pandemic. The campaign provided a platform for the right information from a reliable source to be shared, and myths about the coronavirus to be explored with the right science. The campaign was initiated by HKU LKS Faculty of Medicine. [Source 7]
- **HKU Fight COVID-19 Website** (<https://fightcovid19.hku.hk/>): Development & Alumni Affairs Office established a bilingual website as a repository to consolidate HKU’s efforts in research, learning and public service to combat COVID-19, with support from faculties and departments. The website highlighted and summarised research papers, mainly from the Faculty of Medicine, to help the public digest the key messages easier. Weekly podcast series and global live dialogues with HKU experts to share insights on combating COVID-19 were main programmes produced by this project. The publicity of its content was widely supported by various social media channels. [Source 8]

The timely public awareness campaign helped the general public acquire necessary knowledge about the coronavirus, and contributed to the high level of public awareness and compliance with public health measures in Hong Kong. Preventive measures were enforced spontaneously based on social norms with local or personal context considered. This bottom-up approach played a major role in Hong Kong’s success in keeping the number of infected cases low.

5. Sources to corroborate the impact (indicative maximum of 10 references)

- Source 1: Appointment Letter to HKSAR Government Expert Advisory Panel (Professor Keiji Fukuda)
- Source 2: Emails of acknowledgement from chambers and others
- Source 3: Joint SPH-JMSC Workshop for journalists on COVID-19 and other infectious diseases – overview, publicity channels and feedbacks from journalists
- Source 4: SPH COVID-19 webpage
- Source 5: “Voices from the COVID-19 Frontlines” video series
- Source 6: Live dialogues series
- Source 7: #askHKUMed on HKUMed’s website
- Source 8: HKU Fight COVID-19 website

University: The University of Hong Kong (HKU)
Faculty: Social Sciences
Title of case study: JC A-Connect: Jockey Club Autism Support Network
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>Factors that affect the success of inclusive education of students with autism spectrum disorder (ASD) include providing school-based support that addresses individual needs, training key stakeholders, and improving people's attitude and acceptance. The School Support Team promotes the non-governmental organisation (NGO)–school collaboration model and provides evidence-based training and support to professionals in NGOs and schools to support students with ASD. Many caregivers of children with ASD have additional parenting stress but with training, they can be great working partners in helping their children. The Family Support Team has adapted the World Health Organization's Caregivers Skills Training (CST) programme that aims to promote task-sharing of helping children with ASD. To enhance the public's understanding towards ASD, the Public Education Team has initiated various awareness activities in the community. The most significant impact of our project is that starting from 2021, the Education Bureau (EDB) will adopt the School Support Team's NGO–school collaboration model and provide an additional HK\$62 million per year for small group training for students with ASD in mainstream schools.</p>
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>JC A-Connect has 3 specialised teams: (1) the School Support Team; (2) the Family Support Team; and (3) the Public Education Team.</p> <p>(1) The School Support Team:</p> <ul style="list-style-type: none"> ■ We aim to enhance schools' support to students with ASD and to improve the capacity of the key stakeholders under the NGO–school collaboration model. We adopt and promote evidence-based practices for children with ASD in schools and improve the capacity of the key stakeholders. (Wong et al., 2015). ■ In 2011-15, the EDB commissioned 3 NGOs a pilot project on the enhancement of support services for students with ASD that provided supplemental training to students in mainstream schools. This pilot phase received positive response and the EDB identified that a larger programme was needed to tackle issues including: (a) the small number of NGOs and schools involved; (b) lack of benchmarking of practices and evaluation; (c) inadequate teacher training; and (d) inadequate sharing of good practices. ■ In our model, there are 7 key features: (a) collaborating with EDB in the implementation of the project in schools; (b) introducing the expertise of NGOs to schools by providing school-based services; (c) providing supplemental training to a critical mass of students with ASD so that a significant number of schools would experience its benefits – the training is delivered in a small group format using evidence-based methods, where needs assessment and training goals are highly individualised; (d) implementing strategies to facilitate the transference of skills beyond the training groups by actively involving teachers and parents in the goal setting and training process; (e) capacity-building of key stakeholders, including NGOs, teachers and parents; (f) promoting inclusion in schools; and (g) facilitating knowledge exchange with NGOs, schools and community through the development and dissemination of resource materials to support students with ASD. [R1, R2, R3]

(2) The Family Support Team:

- During 2015-2016, we conducted a survey of 400 parents of children with ASD and found that they generally faced self-stigma, public stigma, anxiety and stress especially before any diagnosis was made.
- Accordingly, we started to adapt and localise the empirical driven CST programme developed by WHO that aims to train parents and non-specialist professionals to become facilitators to further educate parents of children with ASD.
- We have adopted a sequential mixed-method methodology to document the whole adaptation process with multiple interviews with policy makers, and health, social service, and teaching professionals, and parents.
- We also conducted pre-post evaluation of the localised CST in 2019 (Wong et al., submitted). In 2020, we will conduct a randomised controlled trial with about 120 caregivers of children with ASD aged 2-6. The whole research and implementation process is conducted under the guidance of the WHO CST team around the world (Salomone et al., 2018).

3. References to the research (indicative maximum of six references)

[R1] 香港大學心理學系 (2018)。《「賽馬會喜伴同行計劃」自閉特色學生小組訓練資源套 (中學版) 使用指南》。香港：香港賽馬會。

[R2] 香港大學心理學系 (2018)。《「賽馬會喜伴同行計劃」自閉特色學生小組訓練資源套 (小學版) 使用指南》。香港：香港賽馬會。

[R3] Tse, H. M.-Y. & Wong, K. (Under review). Overview of the JC A-Connect school support project – A school support project for students with autism in Hong Kong mainstream schools. Submitted to *Brainchild*.

[R4] Wong et al., (Under review). The resilience of social service providers and families of children with autism or development delays during the COVID-19 pandemic – A community case study in Hong Kong. Submitted to *Frontiers in Psychiatry*.

4. Details of the impact (indicative maximum 750 words)

(1) The School Support Team:

- **Engagement:** Since 2015, 94,000 hours of training were provided in 507 primary and secondary schools (approximately 50% of mainstream schools) and over 26,000 students have received the training; 27 training seminars for over 3,000 teachers have been conducted; 9 training seminars for over 780 NGOs team leaders, advisors and coaches have been delivered; and consultation on intervention plan and group skills to 8 NGOs through training seminars, meetings and on-site group observations have been set up. 26 resource books on different areas of learning, social and emotional needs of students with ASD with evidence-based group-intervention strategies and activities were developed with NGOs and delivered to 2000 primary schools, secondary schools, tertiary schools and NGOs in 2019 [S1]. A “Student Profile Checklist for School Adjustment – Short Form (SPCSA-S)” was also developed to assess the social emotional skills needed for the students to be adaptive in the classroom, with local norms to quickly inform intervention priorities and monitor training [S2].
- **Impact:** Both primary and secondary school students have significant improvement in their school adaptive skills, such as social communication, emotional control, executive functioning and problem-solving [S3, S4, S5]. Teaching personnel assisted in our training

groups in general reported their self-efficacy improved over the three areas: understood students' needs and difficulties, felt competent to manage problems related to ASD using relevant strategies and skills, and held a positive attitude towards mainstream education for students with ASD. Inclusiveness of our Project schools has also been improved with both teachers and parents reported: (a) students felt more accepted; (b) have better relationships and more participation at school; and (c) have better confidence and self-esteem [S3].

- HK\$31 million was awarded by The Hong Kong Jockey Club Charities Trust in 2018 to extend the project for another 3 years, with 2 more NGOs selected as partners to expand the capacity development in NGOs. Another HK\$7.8 million was awarded in 2019 to develop the e-learning platform with courses targeting for parents and teachers in general public with the hope that more people can be benefited from our training. The most significant impact of our project is that from 2021 onwards, EDB will adopt the school support team's model and regularise the support and provide an addition of HK\$62 million per year to enable mainstream primary and secondary schools to collaborate with NGOs in providing small group training on social adaptation and learning ability of students with ASD [S6, S7].

(2) The Family Support Team:

- **Engagement:** 3 consultation meetings with over 45 individuals who are paediatricians, clinical psychologists, social workers and educators from mainstream and special schools; parents, young people with ASD, and supportive community partners who developed teaching aids, created ASD-friendly drama, or generated employment opportunities were engaged in 2018 [S8]; about 30 caregivers who participated in the localised CST provided post-service feedback; the CST was covered in printed and non-printed media; the experiences of conducting the CST was shared in an online international conference as an invited keynote speech (International Society for Autism Research (INSAR), July 16, 2020) and in an academic article (Wong et al., under review).
- **Impact:** We are at the stage of planning to sustain the CST in social service and health care settings with the support of NGO partners and the Hospital Authority. At present, we have already trained more than 200 caregivers of own children with ASD and 130 non-specialised professionals from multiple disciplines as facilitators to deliver the CST from 2020.

(3) The Public Education Team:

- **Engagement:** To promote acceptance and social inclusion, enhance public understanding and facilitate knowledge exchange on ASD, we arranged 22 public/professional events for over 16,600 people with ASD, their families, friends and professionals supporting them; 36 media coverage with a projection of 27.2 million audiences reached; 1 project website cum online learning platform and 15 videos with more than 170,000 view times; 7 issues of publications with more than 401,600 readers. To engage the ASD community with the public, we echoed the worldwide 'Light It Up Blue' campaign in every April, distributed 3,700 free Ocean Park tickets to our service targets, organised students with ASD to co-create a mural in Kam Tin and championed the first-ever ASD-friendly movie screenings for sensory sensitive children in Hong Kong.
- **Impact:** 95% of our public event participants responded that our programmes enhanced their understanding of people with ASD and recognition of building an inclusive society. About 80% of the conference participants agreed that their capacity had been empowered after participating in the conferences. We have become a platform for cross-sectoral collaboration and wisdom exchange among different professions (clinical psychologists, counsellors, education personnel, educational psychologists, occupational therapists, paediatricians, social workers, speech therapists) and a network of local and international

individuals and organisations that support people with ASD (government department/institutes, NGOs, concern groups, universities and potential sponsors). The 'Light It Up Blue' campaign attracted responses from Mainland China and will be continued. Many participants with ASD went to Ocean Park and/or the ASD-friendly cinemas for the first time because they neither have the resources nor would not go in normal settings; some of them discovered their talents and interest in mural creation and continued to beautify the community after our events [S9]. The local cinemas are interested to run more ASD-friendly movie screenings, making Hong Kong a more socially inclusive city for people with ASD.

5. Sources to corroborate the impact (indicative maximum of 10 references)

[S1] 香港大學心理學系 (2018)。《「賽馬會喜伴同行計劃」自閉特色學生小組訓練資源套 (小學版及中學版)》。Retrieved from <https://www.socsc.hku.hk/JCA-Connect/resource-package/?lang=zh-hant>

[S2] Tse, H. M.-Y., Ho, I. T.-F., & Wong, K. (Under review). The Student Profile Checklist for School Adjustment – Short Form (SPCSA-S): A teacher report measure of school adaptive behaviors associated with autism spectrum disorder in primary schools. Submitted to *Autism Research*.

[S3] Ho, I. T.-F. (2018). The JC A-Connect school support programme: Process and results [Presentation]. The Hong Kong ASD Conference 2018, Hong Kong, China.

[S4] Tse, H. M.-Y. & Wong, K. (2020, June). Territory-wide school support project for students with autism in Hong Kong mainstream primary and secondary Schools. Poster presented at the INSAR 2020 Annual Meeting, Seattle, United States.

[S5] Lui, L. (2020, February 3). 共融學習練情緒管理 自閉童衝破社交障礙變 YouTuber. *HK01*. Retrieved from https://www.hk01.com/18區新聞/429050/sen教育-共融學習練情緒管理-自閉童衝破社交障礙變_youtuber

[S6] Education Bureau Circular No. 2/2020: Project on 'Whole School Approach to Providing Tiered Support for Students with Autism Spectrum Disorders'. Retrieved from <https://applications.edb.gov.hk/circular/upload/EDBC/EDBC20002E.pdf>

[S7] Hui, S. (2019, October 4). Three-tier plan proposed to support autistic students. *The Standard*. Retrieved from <https://www.thestandard.com.hk/sections-news-print/212273/Three-tier-plan-proposed-to-support-autistic-students>

[S8] Wong, C. (2016, April 1). 獨自面對心力交瘁 同路人互助學教養. *Ming Pao*. Retrieved from <https://news.mingpao.com/pns/港聞/article/20160401/s00002/1459447052369/獨自面對心力交瘁-同路人互助學教養>

[S9] Striding On (2020, May 18). 兒子一句「早晨」 她等了三年. *HK01*. Retrieved from <https://www.hk01.com/社區專題/472222/兒子一句-早晨-她等了三年>