



The University of Hong Kong  
Technology Transfer Office



**VERSITECH LTD.**

The University Technology Transfer Company

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# THE BEDROCK OF PUBLIC HEALTH SUCCESS



# SUCCESSFUL STORY

## *Success in Taming the Covid-19 Outbreak*

The world has been upended by the Covid-19 pandemic while stemming the spread of infection is an uphill battle at times. Scientists and governments worldwide are working around the clock to combat coronavirus. In a Covid-haunted world where there is neither a standard nor reproducible method to assess virus in sewage, a new cross-disciplinary research team led by Ir Prof Tong Zhang from the Department of Civil Engineering at the University of Hong Kong (HKU) is showing promising results that could help turn the tide.

Supported and entrusted by the Food and Health Bureau as well as the Environment Bureau of the HKSAR Government, the project, Innovative Sewage Testing Tool for SARS-CoV-2, aims to detect different forms of the virus, including live or infectious virus and the genetic marker of the virus, its RNA, in sewage. In plain words, it helps with the detection of 'silent carriers' or people who are asymptomatic by monitoring virus levels in sewage before a catastrophic community outbreak takes place. Since October 2020, Prof 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 that would have otherwise gone unnoticed. One of the widely reported milestone in the research included the quick pinpoint of burgeoning positive cases in Choi

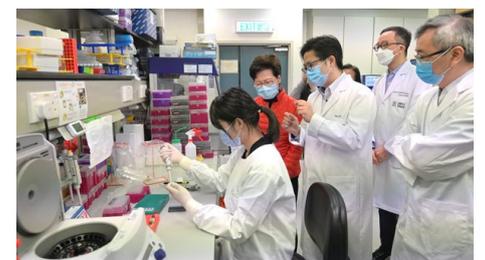
Wan Estate. Up till now, the Government has gazetted compulsory testing operations on 26 areas following the team's insightful data analysis of wastewater surveillance.

"Success never came from sheer luck or amateur persistence. It came with a lot of hard work that spoke deafeningly silent," Ir Prof Zhang remarked. Back to April 2020, Ir Prof Zhang and his postdoc Dr Yu Deng, PhD students Miss Xiawan Zheng and Miss Xiaoqing Xu, as well as his colleagues, Prof Gabriel Leung, Prof Leo Lit Man Poon, Prof Malik Peiris and Dr Hein Min Tun from the School of Public Health, who are all experts in their respective fields of wastewater microbiology, infectious disease epidemiology as well as virology, came together to optimise the sewage testing protocol for SARS-CoV-2 using centrifugal filters for pre-concentration. They also invented a classification scheme which serves as a sensitive early indicator of infections in the local community and allows public health officials to make informed decision about directing resources, such as individual testing or taking other steps to mitigate spread, to the communities that may need them most.

Ir Prof Zhang was also excited by the opportunity the Technology Transfer Office (TTO) offered to collaborate, and to better advance the state of knowledge and technology in evaluating and

applying methods for concentrating and quantifying SARS-CoV-2 with molecular assays in wastewater. TTO has filed patent applications for the team's respective inventions while submitting the project to the International Exhibition of Inventions Geneva which offers a new avenue for the novelties to be made commercially viable and to reshape the global landscape of using sewage testing to protect communities around the world from Covid-19 outbreaks.

The project has proved to be 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.



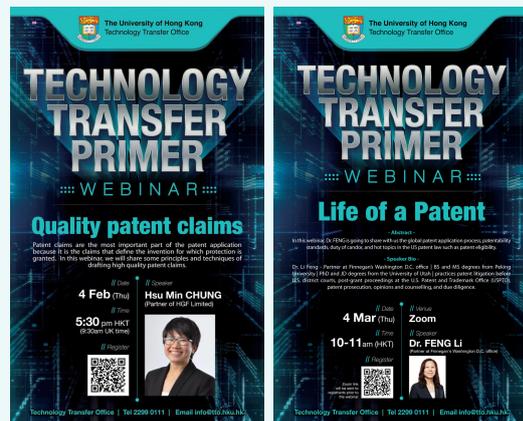
The Chief Executive Carrie Lam (centre) visited the laboratories of HKU on 15 February 2021 to receive a briefing on the sewage testing work and admired the cross-disciplinary team for their undivided attention and concerted efforts.

PHOTO COURTESY OF [NEWS.GOV.HK](https://www.news.gov.hk)

# RECENT HIGHLIGHTS

On 2 February and 4 March 2021, TTO launched two webinars to discuss different cross-cutting issues of patent applications. It was our honour to have speakers from the UK and the US to share with us their wise practices in the respective regions. Both webinars attracted over 160 participants across sectors. We were pleased to see that a number of PIs expressed keen interest in approaching patent applications from a variety of perspectives and exploring the opportunity of collaboration in advancing their research and innovations.

TTO will continue to expand the scope of discussion in order to address variations of interests among different stakeholders. In the next webinar, we will co-organise a webinar with Amazon Web Services (AWS) to examine the concept of cloud computing, which is a new avenue for many researchers. Please stay tuned with us. Don't forget to scan and check out more of our past and upcoming events.



## Patents at a Glance

TTO continued to protect HKU's intellectual property in a timely fashion. 12 patents were filed cumulatively from 29 January 2021 to 12 February 2021 and recapitulated as follows:

**IP00793** Prof. Chi Ming Che; Chemistry (US regular filed on 29 Jan 2021) Iridium (III) Complexes Containing N-Heterocyclic Carbene Ligand, Synthesis, and Their Use Thereof In Cancer Treatment

**IP01011** Prof. Leo Kit Man Poon; School of Public Health (US Provisional filed on 31 Jan 2021) Molecular Detection of a Novel Coronavirus

**IP01020** Prof. Tong Zhang; Civil Engineering (PCT filed on 1 Feb 2021) Sewage Surveillance for COVID-19: Testing Methods, Classification Scheme, Data Interpretation and Use

**IP01000** Prof. Dan Yang; Chemistry (US Provisional filed on 1 Feb 2021) Targeted Delivery of 1,2,4,5-Tetraoxane Compounds and Their Uses

**IP00938** Prof. Ed Wu; EEE (PCT filed on 2 Feb 2021) Systems and Methods For Magnetic Resonance Image Reconstruction from Incomplete K-Space Data

**IP01008** Dr. Shien Ping Feng; ME (US Provisional filed on 3 Feb 2021) Dynamic Urea Bond-Based Passivators of Perovskite

**IP00802** Prof. Wing-Wah Yam, Vivian; Chemistry (US regular filed on 3 Feb 2021) Compositions and Methods for Detection of Amyloid Fibrillation and Plaque Formation

**IP00870** Prof. Zhiwei Chen; AIDS Institute (PCT filed on 4 Feb 2021) PD1-Based Vaccination Composition and Methods Thereof

**IP00924** Dr. Honglin Chen; Microbiology (PCT filed on 5 Feb 2021) Live Attenuated Coronavirus Compositions Methods of Making and Using Thereof

**IP01014** Prof. Barbara Chan; ME (US Provisional filed on 8 Feb 2021) Multiphoton Based, Spatially and Quantitatively Controlled Micropatterns of Soluble Factor Gradients: Methods of Preparation, Products and Applications

**IP00975** Prof. Barbara Chan; ME (US Provisional filed on 9 Feb 2021) A platform for Cell Niche Engineering, Optimizing and Screening – Products, Preparation and Applications

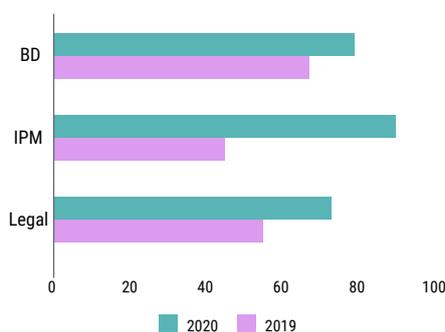
**IP00819** Prof. Kin Man Kevin Tsia; EEE (US regular filed on 10 Feb 2021) Apparatus and Method for Fast Volumetric Fluorescence Microscopy Using Temporally Multiplexed Light Sheets

## Remarkable Efforts

Our three service arms – the business development (BD), intellectual property management (IPM) and the legal team – have played a pivotal role in venturing out into the journeys of technology transfer with our researchers. In January 2021, the total engagements and handling cases of the teams expanded 44.9%, a year-on-year solid growth that beautifully illustrated how TTO has been a key accelerant in assisting members of HKU to connect the dots between the technology milestones they sought to pursue.

The technology commercialisation and industry engagement, entrepreneurship and incubation support as well as marketing outreaches by the BD team marked the fifth straight month of growth in January 2021 and soared 17.9% from a year earlier. The number of cases handled by the IPM team in respect of IDFs, office action matters, evaluation reports, USP/ PCT/ national application filings and more scaled a record high at 100% to a total of 90. Our legal team continued to place a premium on furnishing a wide spectrum of legal services. The team's new cases climbed 32.7% in January from 55 to 73 from a year earlier.

Total Engagements and Handling Cases



### About TTO

The Technology Transfer Office (TTO) is committed to maximising the impact of research through technology transfer at both the institutional and industrial levels. TTO works closely with researchers at HKU to commercialise their inventions through professional consultation on business development, legal advice and assistance, as well as patent application filings. Your inventions would not benefit the society until they are mass produced. Contact us for such a transformation.

### About Versitech

Versitech Limited is the commercial arm of HKU. Versitech negotiates, executes and manages commercial business contracts and agreements on behalf of the University.

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**ACT NOW!**

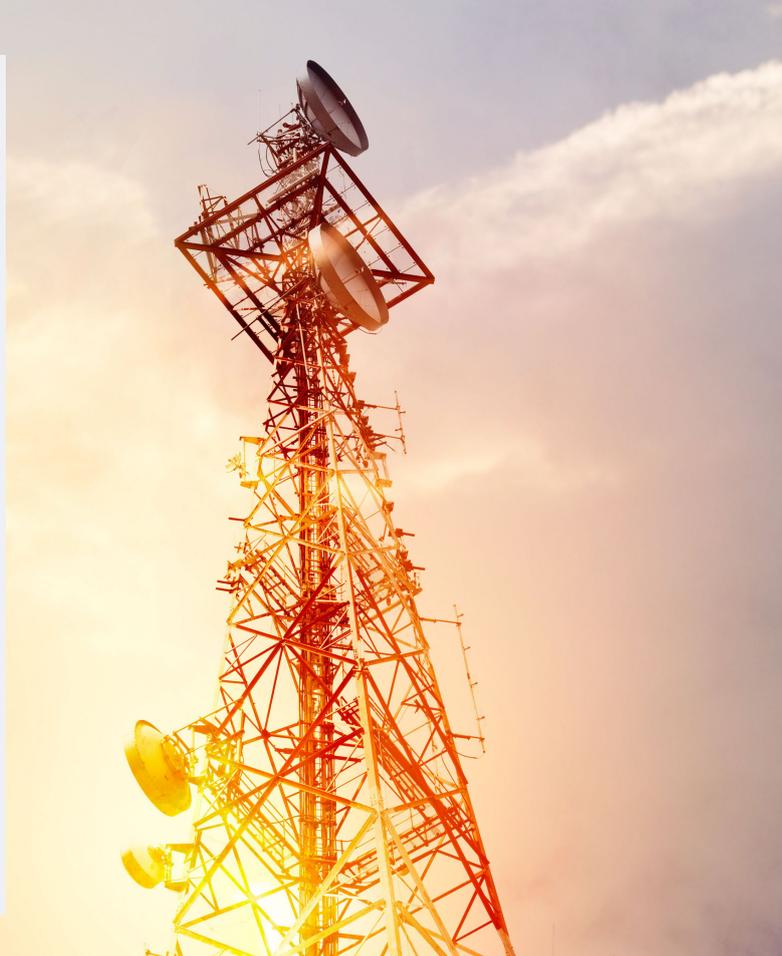
# Transferring Your New Technologies into Business Opportunities

## Policy Stipulation

The latest policy stipulates that the net receipts arising from the exploitation of an Invention are shared among the University, the relevant faculty/department and the inventor(s) in the ratio of 1/3 : 1/3 : 1/3. It aims to encourage the researchers at HKU not only to excel in academic performance but also to apply their technology for the benefits of mankind with an impressive reward.

## Share Your Success Story

Do you have a success story you want to share with colleagues and experts in the field? We have made it easy to do, and your story will appear on our issue. Your success story can inspire greatness. Don't hesitate to send us your story at [emily@tto.hku.hk](mailto:emily@tto.hku.hk).



## How to Apply: 4 Phases for Research Projects

### Phase 1: Initial project negotiation

1. PI will negotiate with their collaborator(s) and confirm a project proposal which includes the scope, budget and duration of the project.
2. PI will negotiate with their collaborator(s) and prepare a draft agreement (Agreement templates are available at the website of the Research Services (RS): <http://www.rss.hku.hk/contracts/contractresearch/templates.>)

### Phase 2: Endorsement from department/faculty

3. PI will submit the project proposal, the draft agreement, and the information form/grant application form to their department/faculty to seek an approval (The information form for research/consultancy agreements is available at: <http://intraweb.hku.hk/local/rss/tto/researchor-consultancy-agreements-form.doc>).
4. After obtaining the approval, PI will submit the project proposal, the draft agreement, and the information form/grant application form to the Research Service (RS).

### Phase 3: Financial legal/IP review

5. The RS will distribute the project proposal and the draft agreement to the Finance and Enterprises Office (FEO) for financial review and to the Technology Transfer Office (TTO) for legal review.
6. If there is any financial/legal issue, the FEO/TTO will inform PI through the RS. PI will negotiate with their collaborator(s) on the financial/legal issue until it is settled.

### Phase 4: Signature and document archiving

7. After consolidating the settled project proposal and the agreement, the RS will proceed to the signature process.
8. After duly performing the signature process, the RS will assign the RCGAS number(s) for opening the project account(s) and archiving all the documents.

## Essential Contact

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