



The University of Hong Kong  
Technology Transfer Office



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The University Technology Transfer Company

# Techxfer

## TTO NEWSLETTER

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### Success Story

*Technology-enabled oral hygiene solution to help the elderly and disabled*

### Event highlights

*Upcoming ZOOM Workshop: Invention Disclosure and Patent Process in HKU | 13th Jan (Thu.)*

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## SUCCESS STORY

# Technology-enabled oral hygiene solution to help the elderly and disabled

### ABSTRACT

In a boon for the elderly and disabled, a new device combines 3D printing and micro-mist technologies to remove dental plaque simply and safely.



Photo 1: (from right to left) Dr James Tsoi, Project Coordinator cum Associate Professor in Dental Materials Science and Mr Karfield Chan, student research assistant.

Removing plaque from teeth is an essential part of oral hygiene. For the elderly and those afflicted with dysphagia—a condition that causes difficulty in swallowing—a new device created by the Faculty of Dentistry team at the University of Hong Kong will bring welcome relief.

The “Plaque cleaning apparatus using dental acrylic 3-D printing technique by micro-mist injection for elderly and disabled” is a new invention that uses

a micro-scale mist to remove initial plaque from teeth. The device combines a personalised 3D-printed mouth guard that holds air and a water channel. Using a tiny amount of water, the micro scale mist removes plaque while at the same time reducing the risk of bacterial infection. It also reduces the risk of aspiration, the term used when liquid or food that should go to the stomach goes instead into lungs. Swallowing problems such as those associated with dysphagia often lead to aspiration. With no need for rinsing, the cleaning device reduces the likelihood of water going into the lungs.

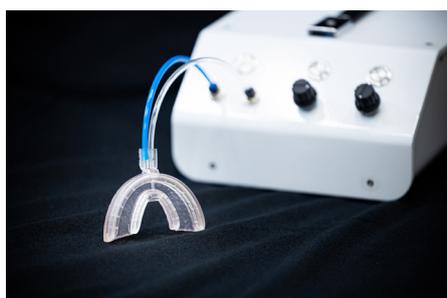


Photo 2: Prototype of mouth guard device with micro-scale mist injection function

The target beneficiaries of the new device are the elderly and people suffering from disabilities. As the population of Hong Kong continues to age, the device is a timely invention. It will improve the quality of life of the two target groups by helping them to eat safely and to feel more confident when smiling and speaking. This in turn will boost their confidence in social interaction and

improve their physical and psychological health.

The project was coordinated by Dr James Kit-hon TSOI, Associate Professor in Dental Materials Science in the Faculty of Dentistry, and was supported by the Innovation and Technology Fund for Better Living. Prototypes of the device have been made and are now undergoing clinical and community trials. The faculty hopes to improve the performance of the device based on feedback and data collection.

The TTO office was able to assist in several ways during the technology transfer of the device. The office arranged to showcase the invention at the InnoCarnival 2021, which is a platform for introducing the best technologies emerging from HKU. The TTO office also assisted the team with IP applications and licensing HKU-originated patents.



Photo 3: Device adopts micro-scale mist to remove plaque

# LATEST PATENTS FILINGS

26 Oct. 2021 - 24 Nov. 2021

IP00978 Kwan Lawrence YEUNG; EEE (CN application filed on 27 Oct 2021)  
Method for Decoding Chord Information from Brain Activity

IP00850 Prof LEUNG Ka-Li Frankie; Orthopaedics and Traumatology (US regular filed on 27 Oct 2021)  
A Novel Thread Design for Bone Screw

IP01007 Prof. YANG Dan; Chemistry (US provisional filed on 28 Oct 2021)  
Luminescent Probes for Detection and Imaging of Reactive Oxygen Species

IP00997 Prof. CHE Chi-Ming; Chemistry (PCT application filed on 29 Oct 2021)  
A color-tunable OLED having long operational lifetime

IP00857 Prof HUI Shu Yuen, Ron; EEE (US regular filed on 28 Oct 2021)  
Battery Charging System and Method Using Dynamically Adjusted Battery Voltage Threshold for Switching Charging Modes

IP00863 Prof WONG Sze Tsai Alice; School of Biological Sciences (US regular filed on 29 Oct 2021)  
A Method for Peritoneal Metastatic Cell Detection and Isolation Thereof

IP00863 Prof WONG Sze Tsai Alice; School of Biological Sciences (CN application filed on 2 Nov 2021)  
A Method for Peritoneal Metastatic Cell Detection and Isolation Thereof

IP00981 Dr. YAN Aixin; School of Biological Sciences (PCT application filed on 4 Nov 2021)  
A transferable type I-F CRISPR-Cas-based genome-editing system

IP00850 Prof LEUNG Ka-Li Frankie; Orthopaedics and Traumatology (JP application filed on 8 Nov 2021)  
A Novel Thread Design for Bone Screw  
IP01111 Prof. PAN Wei; Civil Engineering (CN application filed on 8 Nov 2021)  
一種用於混凝土模塊組合建築的分布水平連接及方法

IP01107 Prof. XI Ning; IMSE and Biomedical Sciences (US Provisional filed on 8 Nov 2021)  
Nano robotic system for high throughput single cell DNA sequencing

IP01110 Dr. CHU Zhiqin; EEE (US Provisional filed on 5 Nov 2021)  
System and methods for ultrafast widefield quantum sensing using neuromorphic vision sensors

IP00850 Prof LEUNG Ka-Li Frankie; Orthopaedics and Traumatology (CN application filed on 9 Nov 2021)  
A Novel Thread Design for Bone Screw

IP01127 Dr. WONG Hai Ming; Dentistry (US Provisional filed on 9 Nov 2021)  
Evaporation Strategy Generated Antibacterial Enamel-like Fluorapatite-Polyacrylic Acid Sheet for Functional Dental Restoration

IP00966A Prof. HUANG, Mingxin; Mechanical Engineering (PCT filed on 12 Nov 2021)  
Anti COVID-19 stainless steel

IP01124 Prof. HUANG Mingxin; ME (CN application filed on 15 Nov 2021)  
一种800MPa高强度热轧螺纹钢及其生产方法

IP01128 Prof. CHEN Zhiwei; AIDS Institute (US Provisional filed on 15 Nov 2021)  
Humanized monoclonal antibody specific to Δ42PD1 shows effectiveness in inhibiting hepatocellular carcinoma progression

IP01005 Prof Wen-di LI (PCT application filed on 16 Nov 2021)  
激光干涉光刻

IP00857 Prof HUI Shu Yuen, Ron; EEE (JP application filed on 22 Nov 2021)  
Battery Charging System and Method Using Dynamically Adjusted Battery Voltage Threshold for Switching Charging Modes

IP00998 Dr. FOK Wai Tung Wilton; EEE (PCT filed on 22 Nov 2021)  
Swimmer Performance Analysis System

# EVENT HIGHLIGHTS

## Upcoming Event - ZOOM Workshop "Invention Disclosure and Patent Process in HKU"



On January 13 at 4pm, the HKUTTO will host "Guidelines for HKU Researchers on the Invention Disclosure and Patent Process," a one-hour Zoom workshop aimed at HKU researchers and potential

IP applicants. It will be led by Dr Yahong Li, Associate Director of Intellectual Property at the HKUTTO and Associate Professor at the Faculty of Law, HKU, followed by Q&A. Pre-registration is required, please register via: [https://hkuemsl.hku.hk/hkuemsl/ec\\_hdetail.aspx?quest=Y&ueid=79603](https://hkuemsl.hku.hk/hkuemsl/ec_hdetail.aspx?quest=Y&ueid=79603)

## Past Event - ZOOM Webinar

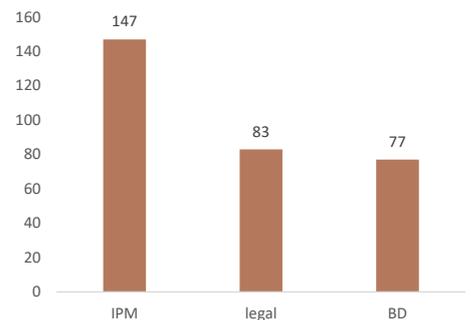
On December 9, the TTO office held a technology transfer primer on Zoom entitled "IP Management: AI and 5G in Healthcare" with talks by Dr Chris Benson and Ms Sofie McPherson of HGF.



# PROGRESS UPDATES

During the year to end November 2021, the legal team completed a total of 83 cases, including 19 Collaboration Agreements and 18 Research Agreements. In November 2021, the IP Management team handled a total of 147 cases, including handling 21 IDFs, up from 12 in the same month last year. The BD team has a total of 77 cases ongoing as of end November 2021, including 51 Technology Commercialization and Industry Engagement cases.

Total Engagements and Handling Cases



# TECHNOLOGY COMMERCIALISATION

## Top 3 revenue-booked IPs in Nov. 2021

Item	IP Type	PI	Faculty
Training on Real Estates Development	Contract Research/Consultancy	Professor KW Chau	Architecture
Study on Residential Buildings	Contract Research/Consultancy	Dr Ren Chao	Architecture
AI-Software	Contract Research/Consultancy	Dr Adela Lau	Science

# 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.

## 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)

## ABOUT US

### About HKUTTO

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 will not benefit society unless they are mass produced.

### 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.

## CONTACT US

### Acting Director

Prof. Max Shen  
Email: [maxshen@hku.hk](mailto:maxshen@hku.hk)

### Deputy Director

Mr. Hailson Yu  
Email: [hailson@tto.hku.hk](mailto:hailson@tto.hku.hk)

### Deputy Director

Dr. Shawn Zhao  
Email: [xzhaogs@hku.hk](mailto:xzhaogs@hku.hk)

### Associate Director (Intellectual Property)

Dr. Yahong Li  
Email: [yali@hku.hk](mailto:yali@hku.hk)

### Principal Legal Counsel

Ms. Eliza Kung  
Tel: 2299-0166  
Email: [eliza@tto.hku.hk](mailto:eliza@tto.hku.hk)

### Senior Manager, Business Development (Science & Engineering)

Mr. Matchy Ma  
Tel: 2299-0128  
Email: [matchy@tto.hku.hk](mailto:matchy@tto.hku.hk)

### Senior Manager, Business Development (Biotechnology)

Dr. Katherine Gan  
Tel: 2299-0173  
Email: [katherine@tto.hku.hk](mailto:katherine@tto.hku.hk)

### Finance and Administration Manager

Ms. Joanne Cho  
Tel: 2299-0177  
Email: [joanne@tto.hku.hk](mailto:joanne@tto.hku.hk)

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