



The University of Hong Kong  
Technology Transfer Office



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## TTO NEWSLETTER

**2023**  
ISSUE 32

### Success Story

Endoscopic surgery by robot (Agilis Robotics)

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# SUCCESS STORY

## Endoscopic surgery by robot

*Agilis Robotics brings game-changing robotic endoscopic surgery closer to reality with its second prototype*

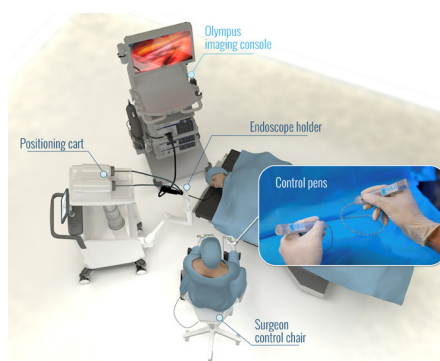


Non-surgical and minimally invasive medical techniques are enabling early detection of cancers, tumors and precancerous lesions. Without the need for external incisions, patients benefit from better outcomes in faster recovery and less discomfort.

Chief among these techniques is endoscopy, a minimally invasive procedure that allows doctors to see inside the body with the use of an endoscope—a long, flexible tube with a lens attached at one end which is inserted into the patient, and a camera steered by the doctor at the other end. Endoscopic surgery has multiple advantages, including reducing the required hospital stay by up to three days, and costing up to one-third the price of general surgery. However, endoscopic surgery involves highly specialized techniques and training only achieved by a small minority of clinicians.

Until now, developing robots for endoscopic surgery has been a challenge because of the high requirement for force transmitted through the robot along thin, flexible endoscopes that pass through narrow pathways inside the human body.

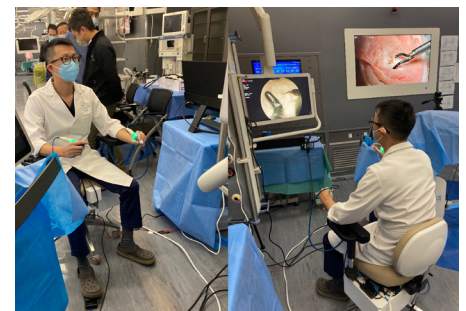
Agilis Robotics is a leading developer of flexible robotic instruments that can overcome these challenges in endoscopic surgery. The company has developed miniaturized robotic instruments that are leading the way in providing more intuitive solutions for surgical control and flatten the learning curve. Its surgical robotic device can integrate seamlessly with existing surgical procedures, particularly in endoscopic submucosal dissection (ESD) along the gastrointestinal tract and en bloc resection of bladder tumours (ERBT) through the urethra, which is a unique capability among current surgical robots.



The Agilis Robotics system is a compact three-part system that comprises a set of flexible surgical robotic instruments, a positioning cart and surgeon's control chair. The prototype is now in its second iteration and features several important improvements. The positioning cart is 50 percent smaller than the previous version, allowing for easy positioning in the operating room and greater patient access. A newly developed endoscope holder gives the surgeon extra flexibility for positioning the endoscope and other robotic instruments, and its automatic

locking mechanism stops the unit from unintended movements, increasing safety of the procedure. The surgical instruments have also been improved. The electro-surgical knife instrument can now perform bipolar diathermy, allowing for improved tissue cutting in bladder tumor resection. The controls and mechanical transmission have also been enhanced to give the surgeon more intuitive and responsive control.

"Our next step is to refine the robotics control and console design in a move to further improve surgical efficiency and ergonomics," the company said. With the aid of The University of Hong Kong – Shenzhen Hospital, the company has recently kickstarted a series of trials in mainland China, in preparation for NMPA and FDA approval towards true commercialization of its system. It expects to complete the first human trial within two years.



The TTO assisted the company on its path by making it a TSSSU+ awardee, helping with IP licensing and introducing a line-up of investors.

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IP01119 Cas9 Protein for genome editing, Dr. WONG Siu Lun, USR 18/176,819, filed on 1 Mar 2023, CN 202310190405.5, filed on 1 Mar 2023

IP01291 Blocking SARS-Cov-2 spike protein-ACE-2 Interaction via Macitentan to rescue post-COVID skeletal sequela, Dr. SF Yuan (Microbiology), USP 63/448,532, filed on 27 Feb 2023

IP01251 Opto chip-based viscometer Dr. CHU Zhiqin (EEE) CN 202310187055.7 filed on 1 Mar 2023

IP01317 e-Inspection System for Modular Integrated Construction (MiC) Manufacturing and Transport Prof. Anthony YEH USR 18/111,467 filed on 17 Feb 2023

SIRI00049 一种用于SARS-CoV-2刺突糖蛋白的抑制剂及其用途 Prof. LI Xiaoyu (Chem) CN 202310194549.8 filed on 3 Mar 2023

IP01276 Method and device for high-throughput single-file focusing of polydisperse particles Prof. Kevin TSIA (EEE) USP 63/486,053 filed on 21 Feb 2023

IP01335 Establishment and Characterization of Cisplatin-Resistant PDX For Nasopharyngeal Carcinoma, Dr. Victor LEE (Clinical Oncology), USP 63/488,525 filed on 6 Mar 2023

IP01152 苯并噻唑类化合物、其制备方法及应用, Dr. LIU Li CN 202310158328.5 filed on 23 Feb 2023, PCT PCT/CN2023/077984 filed on 23 Feb 2023

IP01248 一种用于钢结构模块化组合建筑的卡件式模块连接方式, Prof. PAN Wei (Civil Eng) CN 202310204406.0 filed on 6 Mar 2023

IP01281 A microfluidic pipeline for isolation and analysis of single viruses, Prof. Anderson SHUM (ME), USP 63/488,802 filed on 7 Mar 2023

IP01268 Aminoxy Acid-Based Antibacterial Compounds and Methods Thereof, Prof. YANG Dan (Chem), USR 18/179,840 filed on 7 Mar 2023

IP01058 ORAL-JET Procleaning Systems, Dr. TC Ng, PCT PCT/CN2023/080272 filed on 8 Mar 2023

IP00985 Strong and Ductile Medium Manganese Steel and Method of Making, Prof. HUANG Mingxin, US-PCT 18/044,935 filed on 10 Mar 2023

IP01328 Smart Meter Analyser (SMAN) 智能水表测定仪, Ms. Angela Lee (Centre for Water Technology and Policy), CND 202330109466.5 filed on 10 Mar 2023, HKD 23211574 filed on 10 Mar 2023

IP00955A A Method of Making Extracts of Spatholobus Suberectus Dunn (SSP), Compositions Thereof and Method for Treating Viral Diseases, Dr. Chen Jianping (SCM), PCT PCT/Cn2023/081058 filed on 13 Mar 2023, TW 112109368 filed on 14 Mar 2023

SIRI00051 Novel DNA-displayed inhibitors of SARS-CoV-2 main protease (Mpro), Prof. LI Xiaoyu (Chemistry), CN filed on 13 Mar 2023

IP01304 Remdesivir Cocrystal, Compositions and Methods Thereof, Dr. Aviva Chow (Pharmacology) USP 63/489,894, filed on 13 Mar 2023

IP01303 3D Bioprinting of Tumor Tissue for Mechanistic Study and Drug Screening, Prof. Kwan MAN (Surgery), USP 63/490,077, filed on 14 Mar 2023

IP01302 An integrated digit in noise test to evaluate hearing and cognitive function, Prof. WONG Lai Nar Lena (Faculty of Education), USP 63/490,032 filed on 14 Mar 2023

IP01145 模块化组合建筑、用于其的模组及其建造方法, Prof. PAN Wei (Civil) CN 202310254431X, filed on 16 Mar 2023

IP01120 Discovery of YEATS2 YEATS Domain Inhibitors as Novel Anti-Cancer Agents, Prof. LI Xiang David, USR 18/185,449 filed on 17 Mar 2023, CN 202310266631.7 filed on 17 Mar 2023, EP 23162698.7 filed on 17 Mar 2023

IP01279 Electroplating Solution Composition for Forming a Low Impurity Electroplated Film, Prof. FENG Shien-Ping (CityU), USP 63/433,490, filed on 19 Dec 2022

IP00998 Swimmer Performance Analysis System, Dr. FOK Wai Tung Wilton, CN filed on 22 Mar 2023

IP01314 Self-powered smart skins for multimodal static and dynamic tactile perception, Dr. SHIN Dongmyeong (ME), USP 63/453,817 filed on 22 Mar 2023

IP01316 High-strength magnetic hydrogels with photo-weldability made by stepwise assembly of Fe3O4-nanoparticle-integrated aramid nanofiber composites, Dr. Xu LIZHI (ME), USP 63/491,959 filed on 24 Mar 2023

IP01216 A microfluidic platform for digital droplet bioassay with spatially programmable thermal cycler, Prof. Anderson SHUM (ME), USP 63/491,966 filed on 24 Mar 2023

IP01326 Switchable power generation in triboelectric nanogenerators, Dr SHIN DONGMYEONG (ME), USR 18/126,026 filed on 24 Mar 2023

IP01143 The Use of LANCL1 and Antibodies Thereof as A Diagnostic and Therapeutic Target for The Management and Treatment of Cancer, Prof NG LUI Oi Lin, Irene, USR 18/189,528 filed on 24 Mar 2023

IP01321 Automotive In-Cabin Monitoring via Acoustic Sensing, Dr WU Chenshu (Computer Science), USP 63/492,250 filed on 27 Mar 2023

IP01153 Aerial Continuum Manipulator with Kinematics for Variable Loading and Minimal Tendon-Slacking, Dr. Peng LU (ME), USR 18/191,494 filed on 28 Mar 2023

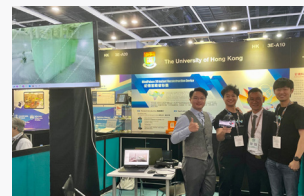
IP01327 Method and apparatus for aquatic and airborne microplastic identification with polarized digital holography, Mr Yanmin Zhu (EEE), USP 63/492,763 filed on 28 Mar 2023

IP00998 Swimmer Performance Analysis System, Dr. FOK Wai Tung Wilton (EEE), HKST 52023070771.0 filed on 28 Mar 2023

IP01196 CuDATA Catalyst for Nitrate Electroreduction to Generate Ammonia, Dr. TSE Edmund Chun Ming (Chem), PCT PCT/CN2023/085161 filed on 30 Mar 2023

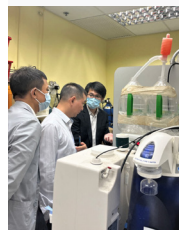
## InnoEX Exhibition

The Manifold Tech team exhibited their 3D Instant Reconstruction Device and other 3D applications at the InnoEx, held at Hong Kong Convention and Exhibition Centre from April 12 to 15.

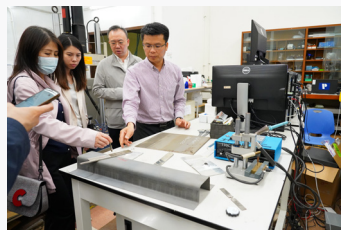


## Meeting & Lab Visits

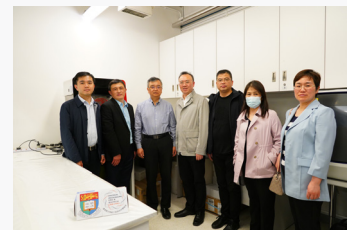
The TTO team met with members of the Nanjing Government to discuss technology innovation. The TTO co-organized with HKU SPACE a visit for a delegation from The People's Government of Shenzhen Municipality to Dr Edmund Tse's lab to see his work on renewable energy projects. A delegation from Nanjing Municipal Science and Technology Bureau visited the lab of Professor Zhang Tong to learn about his innovative sewage surveillance system. They also visited the lab of Professor Huang Mingxin to see the new materials he is developing for multiple uses.



Dr Edmund Tse's Lab Tour



Prof Huang Mingxin's Lab Tour



Prof Zhang Tong's Lab Tour

# PROGRESS UPDATES

The Legal Team received 86 new cases in March and completed 56 cases, including six collaboration agreements and nine research agreements.

The IPM Team handled 113 cases in March, up from 103 in March 2022. The figure includes 38 USP/PCT/national applications filed, up from 26 in 2022.

The BD Team handled 116 cases last month, a sizeable increase on the 91 handled in the same month last year.

# TECHNOLOGY COMMERCIALISATION

## List of technologies Licensed March 2023

Title	IP Types	PI	Faculty
Human Nasal Organoids and Methods of Making and Methods of Use Thereof	US Provisional Application No. 63/358,795	Dr. Jie Zhou	Medicine
An efficient purification method for nanodiamonds	PCT Application No. PCT/CN2021/125267	Dr. Zhiqin Chu	Engineering
Fabrication of a scalable quantum sensing device through precisely programmable patterning spin defects on universal substrates	Copyright	Versitech	Engineering

## Top 3 revenue-booked IP in March 2023

Title	IP Types	PI	Faculty
Covid-19 sewage surveillance technology	HK Patent No. HK30044162 PRC Application No. 202110495376.4	Dr. Jie Zhou	Medicine
Covid-19 sewage surveillance technology	HK Patent No. HK30044162 PRC Application No. 202110495376.4	Dr. Zhiqin Chu	Engineering
e-form	Copyright	Versitech	Versitech

# 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.

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