The University of Hong Kong
Technology Transfer Office

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TTO NEWSLETTER

2021
ISSUE 14

HKU E-TECH NEWS

- Metal Hydroxides Actuation Material used as Artificial Muscles in Microrobots or Actuator in Cooling Electronics

EVENTS HIGHLIGHT

- Webinar | Geneva 2021 Awardees' Sharing: Momentus Robotics - MR-safe Actuators
- GBA Innovation Summit

LATEST PATENTS FILINGS

PROGRESS UPDATE

TECHNOLOGY COMMERCIALISATION

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HKU TECH NEWS

METAL HYDROXIDES ACTUATION MATERIAL USED AS ARTIFICIAL MUSCLES IN MICROROBOTS OR ACTUATOR IN COOLING ELECTRONICS

Reference: IP00840

The world's first material system that can be actuated directly by visible light and electricity without additional fabrication procedures.

BACKGROUND

- Many material systems are capable of producing actuation when driven by electricity, yet electrical wiring and additional components, such as electrolyte and electrodes, are required, which would limit their applications.
- Therefore, materials capable of producing actuation when stimulated not only by electricity, but also by light & heat are of great interest because they can offer tremendous potential in applications as wireless actuators for microrobots.
- A few materials have been found to have light-triggered actuation properties before, but most of these are powered by ultraviolet (UV) or near-infrared (NIR) light.
- Other light or heat-sensitive materials have very slow actuation responses that may take tens of seconds to fully actuate, or they require very high light intensities yet produce rather low actuating stress.

RESEARCH TEAM

The research team members are all from the Department of Mechanical Engineering at HKU Faculty of Engineering, led by Professor Alfonso Ngan's group in collaboration with Dr Li Wen-di 's group on light actuation experiment and Dr Feng Shien-ping's group on electrodeposition experiment.

TECH OVERVIEW

The invention is a type of miniaturized actuators, made of metal hydroxides supported by specially selected passive layer (Figure 1), which could function to producing huge and stable force and displacement under electrical/light/heat stimulations.

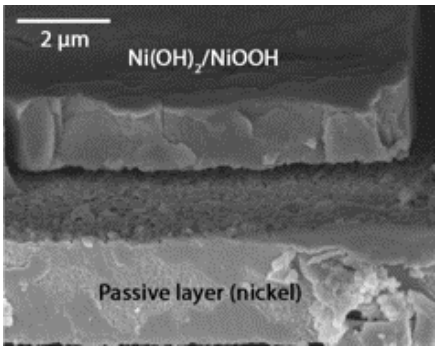
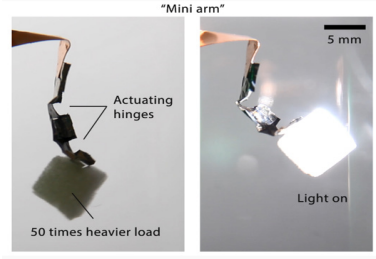


Fig. 1 Example 1: Ni(OH)2/NiOOH deposited on a passive layer (e.g. Ni) by anodic electrodeposition

It is the world's first material system that can be actuated directly by visible light and electricity without additional fabrication procedures (Figure 2).



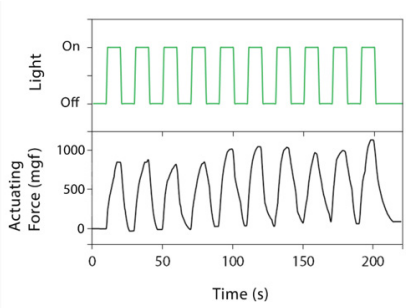


Fig. 2 (Left) A mini arm with two actuating hinges lifting a weight 50 times heavier than itself under light; (Right) Actuating force of a 0.3-mg nickel hydroxide-oxyhydroxide actuator under periodic light

It can be applied in microrobots or microscale devices in which conventional actuators are too bulky to be used.
It can also be used as actuator for innovative cooling electronics.

APPLICATION

- Artificial muscles in microrobots
- Actuators decoration use like flameless candles
- Actuator for in cooling electronics
- Application in auto focus lens

PATENTS

- PCT Application No. PCT/CN2020/074261

LATEST PATENTS FILINGS

29 Apr 2021 - 28 May 2021

IP00829 Dr FENGShien-Ping; ME (CN application filed on 29 Apr 2021)
Synthesis and application of light management with thermochromic hydrogel microparticles

IP00908 Dr SU Yuxiong; Dentistry (CN application filed on 30 Apr 2021)
Novel microneedle array loaded with anti-PD-1-cisplatin-nanoparticles for synergistic cancer immuno-chemotherapy

IP00910 Dr TANG Llewellyn; Real Estate and Construction (PCT filed on 30 Apr 2021)
Autobject: a dense 3D modelling method for IFC BIM object production from RGB-D videos

IP00918 Dr ZHANG Fu; ME (PCT filed on 30 Apr 2021)
A Way to Save UAV's Energy Consumption and Improve Its Hovering Accuracy

IP00790 Prof CHEN Honglin; Microbiology (EP application filed on 29 Apr 2021)
Live Attenuated Influenza B Virus Compositions Methods of Making and Using Thereof

IP00985 Prof. HUANG Mingxin; ME (PCT filed on 6 May 2021)
Strong and Ductile Medium Manganese Steel Produced Through Warm rolling, Cold rolling and Annealing

IP00752 Dr KWOK Ka Wai; Mechanical Engineering (HK standard application filed on 6 May 2021)
Fluid Powered Master-Slave Actuation for MRI-Guided Interventions

IP00910 Dr TANG Llewellyn; Real Estate and Construction (HK short term application filed on 3 May 2021)
Autobject: a dense 3D modelling method for IFC BIM object production from RGB-D videos

IP01020 Prof. ZHANG Tong; Civil Engineering (CN application filed on 7 May 2021)
Sewage surveillance for COVID-19: testing methods, classification scheme, data interpretation and use

IP01043 Prof WANG Liqiu; ME (US provisional filed on 7 May 2021)
pH-responsive smart anti-pathogen coatings that controlled repel and inactivate viruses and bacteria

IP00962 Prof YUEN Kwok-Yung; Microbiology (PCT filed on 10 May 2021)
Compositions and Methods for Broad Spectrum Anti-viral Therapy

IP01076 Prof. YAM Vivian Wing-Wah; Chemistry (US provisional filed on 10 May 2021)
Luminescent Gold(III) Compounds with Thermally Stimulated Delayed Phospho-Rescence (TSDP) Property For Organic Light-Emitting Devices and Their Preparation

IP00790 Prof CHEN Honglin; Microbiology (Canadian application filed on 13 May 2021)
Live Attenuated Influenza B Virus Compositions Methods of Making and Using Thereof

IP00790 Prof CHEN Honglin; Microbiology (CN application filed on 14 May 2021)
Live Attenuated Influenza B Virus Compositions Methods of Making and Using Thereof

IP00694 US; Dr CHOI Hoi Wai; EEE (US divisional filed on 17 May 2021)
Strain-inducing Nanostructures for Spectral Red-shifting of Light Emitting devices

IP01067 Prof. YUEN Kwok Yung; Microbiology (US provisional filed on 14 May 2021)
Dry powder formulation of tamibarotene for pulmonary and intranasal delivery

IP01046 Dr WANG Weiping; Dr. Li Dak-Sum Research Centre (US provisional filed on 14 May 2021)
Inhibition of macropinocytosis provides a synergistic strategy for improved photodynamic therapy

IP00953 Prof. YUEN, Kwok Yung; Microbiology (PCT filed on 21 May 2021)
The first generation of synthetic vaccine against Staphylococcus aureus infection

IP00790 Prof CHEN Honglin; Microbiology (US regular filed on 17 May 2021)
Live Attenuated Influenza B Virus Compositions Methods of Making and Using Thereof

IP01042 Prof WANG Liqiu; ME (US provisional filed on 28 May 2021)
Self-Cleaning Pathogen-Repellent Coatings

IP01047 Dr Song You-Qiang; School of Biomedical Sciences (US provisional filed on 21 May 2021)
Targeting Pax6 pathway linking between amyloid β plaques and neurofibrillary tangles by using Palbociclib and Apigenin in Alzheimer's disease mouse

IP01054 Prof. CHAN Barbara; Mechanical engineering (US provisional filed on 27 May 2021)
Bioengineered dermal papilla and hair follicles – Products, Methods and Applications

IP01040 Prof LU Liwei; Pathology (US provisional filed on 19 May 2021)
Utilisation of cardiolipin as immune adjuvant

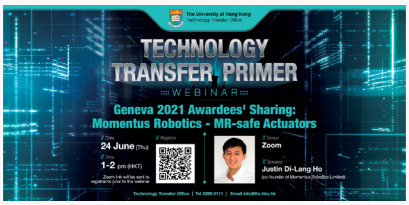
NEWS & EVENTS

Event Highlight -GBA Innovation Summit

HKU Technology Transfer Office took part in the GBA Summit of the StartmeupHK Festival on May 25. The virtual Festival connects Hong Kong's start-ups with like-minded businesses, governments and stakeholders from around the globe.

Event Highlight - Webinar

Technology Transfer Primer: Geneva 2021 Winners Momentus Robotics



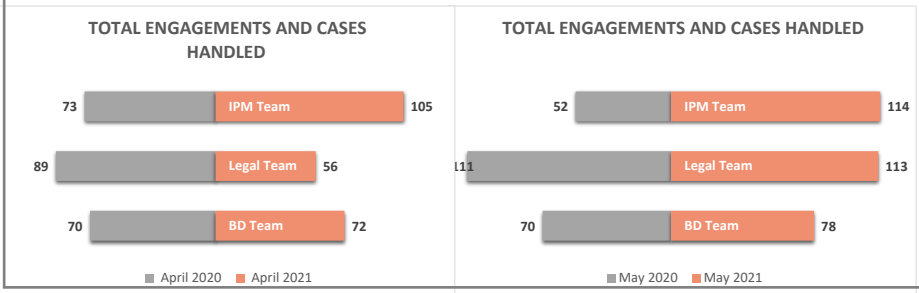
On June 24, Justin Di-Lang Ho, co-founder of Momentus Robotics Limited, which develops high-performance MR-safe hydraulic motors for MRI-guided robotic systems, shared his team's technology transfer story as well as trends and updates.

PROGRESS UPDATE

The Business Development team handled a total of 150 projects in April and May, up from 140 in the same two months last year.

The Legal team worked on 101 cases (including 56 new ones) in April, compared to 89 cases in April 2020. In May, they handled 164 cases (113 new ones), up from 111 a year earlier.

The IP management team processed 31 IDFs in April and May, up from 19 for the same two months in 2020.



TECHNOLOGY COMMERCIALISATION

List of technologies Licensed in April and May 2021

Item	IP Type	PI	Faculty
A Live Strain of Staphylococcus Aureus and Uses Thereof	US Provisional Application No. 63/028,710 US Provisional Application No. 63/123,635	Prof. Jiandong Huang	Medicine
Sewage surveillance for COVID-19: testing methods, classification scheme, data interpretation and use	US Provisional Application No. 63/135,262 HK Application No. 32021024316.0 PCT Application No. PCT/ CN2021/074675	Ir Prof. Tong Zhang	Engineering

Top 3 revenue-booked IPs in April and May 2021

Item	IP Type	PI	Faculty
A Live Strain of Staphylococcus Aureus and Uses Thereof	US Provisional Application No. 63/028,710 US Provisional Application No. 63/123,635	Prof. Jiandong Huang	Medicine
Compound activity study	Consultancy Service	Prof. Honglin Chen	Medicine
Versitech e-Form	Computer Software	-	-

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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