2021 Professor Charles K. Kao Student Creativity Awards 高錕教授學生創意獎

BME Students Win in Professor Charles K. Kao Student Creativity Awards 2021 https://www.pckksca.cintec.cuhk.edu.hk/

Award	Project Title	Awardees
Champion (Postgraduate Individual)	Extracting Functional Mitochondrial Using Microfluidics Device	RAHMAN Md Habibur (BME PhD Student) and his teammate from Biochemistry (WONG Chung Hong Nathaniel)
Champion & Special Award (Postgraduate Group)	Electromagnetically Actuated Soft-Tethered (EAST) Colonoscope	PAN Tianle Flippy (BME PhD Student) and his teammates from Surgery (LI Yehui, XIN Wenci)
Second Runner-up (Postgraduate Group)	Highly Dynamic Nanocomposite Hydrogels Self-assembled by Metal Ion-ligand Coordination	YUAN Wei Hao, LAI Chun Him Nathanael, TUNG Lok Him (BME PhD Students) and their teammates from Orthopaedics & Traumatology (YAO Zhi, XU ShunXiang, GUO Jia Xin)

Here is the brief introduction of the award projects:

Champion (Postgraduate Individual)

RAHMAN Md Habibur (BME PhD Student) and his teammate from Biochemistry (WONG Chung Hong Nathaniel)

Project Title:
Extracting Functional Mitochondrial Using Microfluidics Device

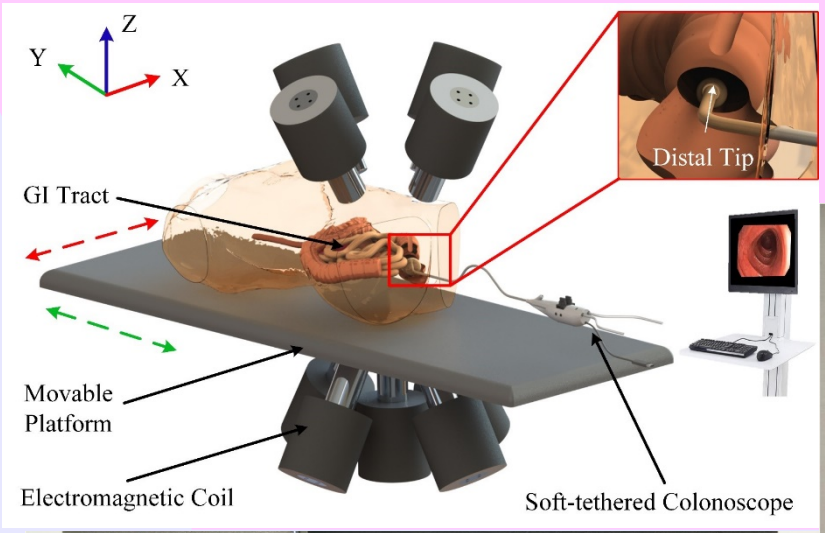
Analysis of mitochondria is crucial to understand the mechanism of mitochondrial dysfunction related disease, for example neurogenerative disorders, cardiovascular failure, aging and several types of cancers. Mitochondria will need to be extracted out from the cell before analysis and explore the possibility to develop therapeutic solutions, however, current extraction methods to physically disrupt cell membrane or chemical lysis significantly deteriorate mitochondrial quality. The winning project has demonstrated a microscale cell shredder where we can selectively disrupt the cell membrane, without disrupting the mitochondrial membrane.

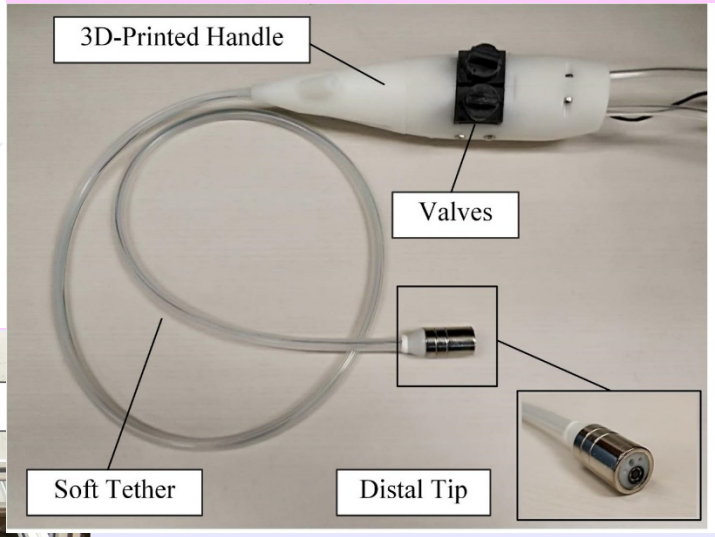
Champion & Special Award (Postgraduate Group)

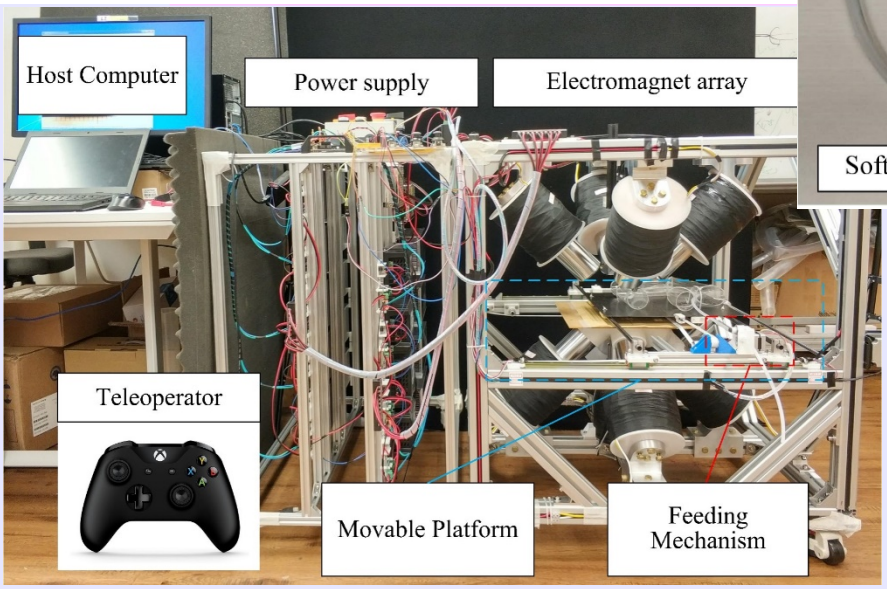
PAN Tianle Flippy (BME PhD Student)
and his teammates from Surgery (LI Yehui, XIN Wenci)

<u>Project Title:</u>
<u>Electromagnetically Actuated Soft-Tethered (EAST) Colonoscope</u>

The winning project is designed by a team of three PhD students from Department of Surgery (YeHui LI, WenCi XIN) and Department of Biomedical Engineering Zheng Li's group (TianLe PAN Flippy). The team has designed an Electromagnetically Actuated Soft-Tethered (EAST) colonoscope system for early colon rectal cancer (CRC) screening. Traditional CRC screening cause pain to patient and required high execution skill for surgeons. To promote early CRC screening to the public and shorten the learning path for colonoscopy surgeons, this team has developed a safe, effective, efficient and easy-to-use solution for colonoscopy. By a combination of electromagnetic technique and soft materials, this device can help relieve the pain and lower skill requirements for surgeons. In the next step, we plan to introduce AI technology to help polyp detection and autonomous navigation, therefore enable rapid colon inspection and reduce workload of endoscopists.





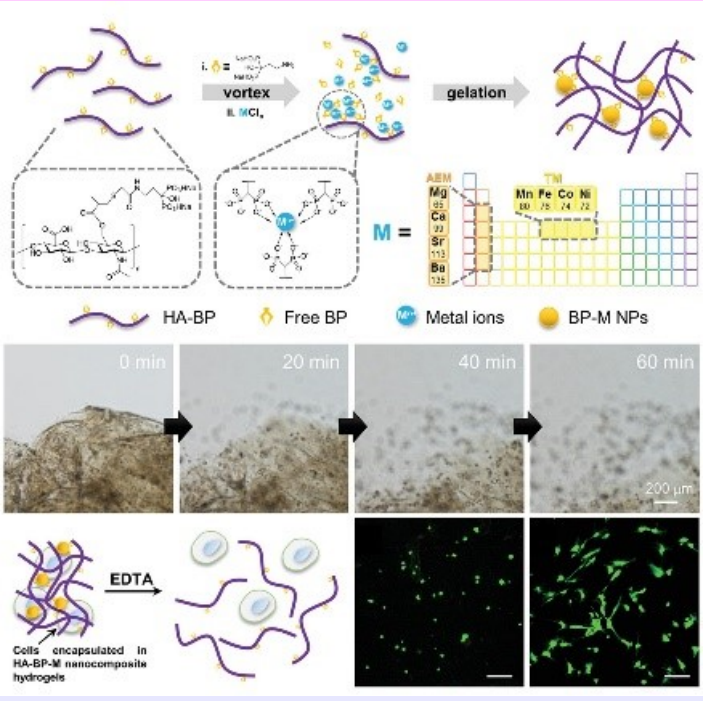


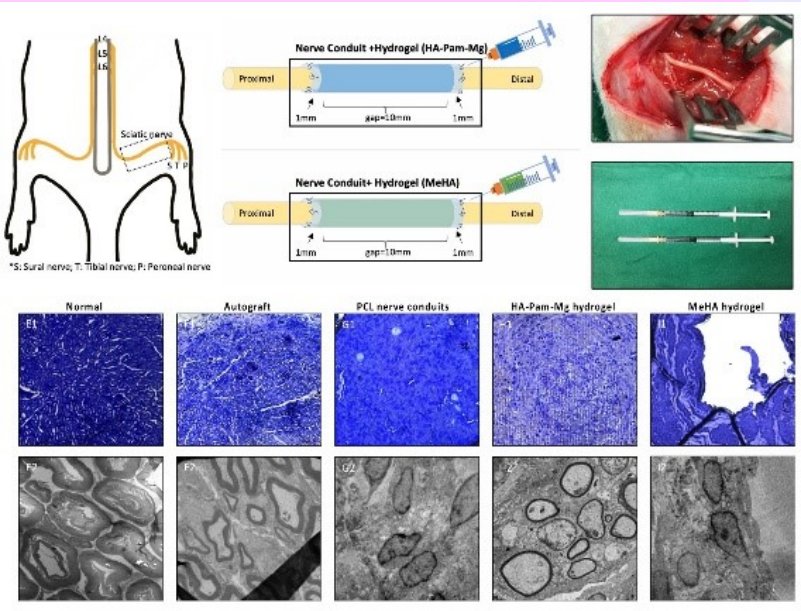
Second Runner-up (Postgraduate Group)

YUAN Wei Hao, LAI Chun Him Nathanael, TUNG Lok Him (BME PhD Students) and their teammates from Orthopaedics & Traumatology (YAO Zhi, XU ShunXiang, GUO Jia Xin)

<u>Project Title:</u>
<u>Highly Dynamic Nanocomposite Hydrogels Self-assembled by Metal Ion-ligand Coordination</u>

The team demonstrated a generalized approach to fabricate self-assembled nanocomposite hydrogels via the dynamic ligand–metal-ion coordination and studied the effects of different metal ions on the hydrogel properties. Because of the dynamic coordination between BP and metal ions, such nanocomposite hydrogels exhibit remarkable dynamic properties, such as excellent injectability, rapid stress relaxation, efficient ion diffusion, and tunable mechanical properties. Their findings show that the HA-BP-Mg hydrogel can effectively promote axon growth and functional recovery post sciatic nerve injury, thereby giving a promise for the potential translational applications.





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