

## Appendix

CUHK awarded projects in the International Exhibition of Inventions Geneva 2022

<b>Awards</b>	<b>Principle Investigator (Department)</b>	<b>Project Title</b>	<b>Project Description</b>
Gold Medal	Professor CHAN Ka Leung Francis, Dean of the Faculty of Medicine (Medicine and Therapeutics) Professor NG Siew Chien (Medicine and Therapeutics)	Specific Fecal Bacterial Markers of ASD	This invention relates to global first autism spectrum disorder (ASD)-specific fecal bacterial markers, which have been developed into a non-invasive, affordable, effective tool to facilitate early ASD diagnosis.
	Professor CHEN Weitian (Imaging and Interventional Radiology)	Non-invasive Biochemical Imaging of Human Tissues Using Spin-lock Magnetic Resonance Imaging	This invention can be used for the non-invasive diagnosis of biochemical properties of various human diseases at early stages. It can also be used for monitoring the effectiveness of disease treatment. One application of this novel MRI technique is to diagnose liver fibrosis by directly imaging macromolecule depositions in the liver, which provides opportunities to detect liver fibrosis at early stages for timely treatment.
	Professor QIN Ling (Orthopaedics and Traumatology)	Biodegradable Magnesium(Mg)- based Hybrid Implant	Innovative Mg-based hybrid locking screw system with locking plate for fracture fixation. This system can enhance the healing of fractures with a biodegradable Mg-based hybrid locking screw while minimising the chance of bone refracturing during implant removal.
	Professor CHEN Shih Chi (Mechanical and Automation Engineering)	Ultrafast oscillating blade microtome	This new oscillating blade microtome enables the precise sectioning of various ultrasoft tissues, fresh tissues and fixed whole organs that were hard to process before. Sectioning of soft tissues is achieved by exploiting the viscoelastic effect, i.e., the tissue self-stiffens at high frequency. This invention can help solve key challenges in novel bio-imaging applications, creating huge market value for pathology and biophotonics industries.

Silver Medal	Professor SO Wing-Chee, Catherine (Education Psychology)	Robot for Autism Behavioral Intervention® (RABI®)	RABI®, an innovative, evidence-based intervention, aims to enhance the social, cognitive, and physical functioning of individuals with autism, help to include them in society and eventually promote their economic self-sufficiency.
	Professor LUI Po Yee, Pauline (Orthopaedics and Traumatology)	Bioactive Decellularized Stem Cell Sheet for Tissue Repair	The bioactive decellularized stem cell sheet can be used for the promotion of tissue repair and as a scaffolding material for the synthesis of bio-artificial tissue.
	Professor CHEN Weitian (Imaging and Interventional Radiology)	System for Automatic Articular Cartilage Thickness Mapping	Cartilage loss is shown to be a risk factor of Osteoarthritis (OA) which is one of the main causes of disability in older people. This invention, consisting of methods in image segmentation, three-dimensional reconstruction, morphological quantification, and 3D visualisation, is a system for automatic mapping of articular cartilage thickness mapping.
	Professor WANG Chi Chiu, Ronald, Dr. CHUNG Pui Wah Jacqueline, Prof. ZHANG Tao Judy, Dr. MAN Chi Wai Gene & Dr. HUNG Sze Wan Kennes (Obstetrics and Gynaecology)	Pro-EGCG for Treatment of Endometriosis	A novel molecule derived from green tea as a prodrug of EGCG (Pro-EGCG) for endometriosis treatment with strong chemical stability, bioavailability, anti-angiogenic effects, and no hormonal side-effects.
	Professor WANG Chi Chiu, Ronald, Dr. CHUNG Pui Wah Jacqueline, Prof. ZHANG Tao Judy, Dr. MAN Chi Wai Gene & Dr. HUNG Sze Wan Kennes (Obstetrics and Gynaecology)	EndoTest for Prediction of Implantation and Pregnancy Outcomes	An innovative, comprehensive test of immune cell profile in the endometrium (EndoTest) before natural and artificial conception to predict successful implantation and improve pregnancy rate and outcomes. Women who experience reproductive failure, including infertility, recurrent miscarriage and implantation failure, can take the EndoTest to improve the implantation and pregnancy success rate.
	Professor QIN Ling (Orthopaedics and Traumatology)	Novel Therapeutic Device for Prevention and Treatment of Knee Osteoarthritis and Related Degenerative Diseases	This project is about R&D and application of a novel therapeutic device for prevention and treatment of knee osteoarthritis and related degenerative diseases.
	Professor CHAN Ka Leung Francis, Dean of the Faculty of Medicine (Medicine and Therapeutics)	Level Up FMT Treatment	By identifying and modulating the gut microbiota with a proprietary algorithm, this invention enables donor and recipient matching, which increases the

	Professor NG Siew Chien (Medicine and Therapeutics)		cure rate of a deadly disease, <i>Clostridioides difficile</i> infection.
	Professor CHAN Yiu Leung David (Obstetrics and Gynaecology)	Zygote Morphokinetic Predictor (ZMP)	ZMP is an AI-based invention that captures useful morphokinetic data from a zygote. It can predict the embryo potential on forming a blastocyst, providing an early, precise decision about embryo transfer to support IVF experts.
	Professor LAU Tat Ming Darwin (Mechanical and Automation Engineering)	Cable-driven Inspection Robot for High-rise Building Façade	This is a mobile cable robot system with four components to perform contact-based façade inspections. It simplifies the current workflow, eliminating the need for working at height and providing a quantitative, digital diagnosis.
	Professor LAU Tat Ming Darwin (Mechanical and Automation Engineering) Professor Adam FINGRUT (School of Architecture) Professor Yeung YAM (Mechanical and Automation Engineering)	CU-Brick Robotic Brick Construction Robot	The CU-Brick is an automated robotic system with four primary components that constructs brick structures: a cable-driven parallel robot, an automated brick delivery system, a human-robot collaborated mortar application and a computational design framework. CU-Brick allows large-scale brick structures of complex geometry to be constructed due to its high levels of accuracy, efficiency and automation.
Bronze Medal	Professor TANG Ming Kuen, Patrick (Anatomical and Cellular Pathology)	A Novel Neutrophil-based Anticancer Immunotherapy	Mass production of a novel human neutrophil N1 subset with potent anticancer capabilities for allogeneic immunotherapy by genetic engineering peripheral blood cells with CRISPR/Cas9 editing technology.
	Professor XU Jiankun, Jerry (Orthopaedics and Traumatology)	Magnesium and Vitamin C Containing Solution for Intra-articular Injection	A formula composited of magnesium and vitamin C can promote cartilage regeneration in osteoarthritis. This is the first promisingly cost-effective avenue to do so, independent of gene therapy.
	Professor LI Zheng (Surgery)	A Semi-autonomous Stereotactic Brain Biopsy Robotic System with Enhanced Safety	This invention provides a new brain biopsy cannula design and a robotic system for accurate cannula positioning and safe stereotactic brain biopsy. It helps to shorten operation times, improve biopsy yield success rate and reduce complications, such as haemorrhage during brain biopsy. It also helps to shorten the learning curve and reduces operation variances among surgeons.

