

Appendix

List of funded CUHK researchers and projects

1. **Professor Ng Siew-chien**, Professor, Department of Medicine and Therapeutics, and Assistant Dean (Development), CU Medicine
Project title: **Translating microbiome, multi-omics and dietary innovations to enhance inflammatory bowel disease diagnosis and outcome**

Crohn's disease (CD), a subtype of inflammatory bowel disease that causes chronic intestinal inflammation, is of increasing incidence around the world and is one of the leading causes of adolescent and adult disability worldwide. Diagnosis is challenging as presentation can mimic infectious diseases and cancers. Suspected cases frequently undergo invasive and expensive tests, leading to delayed diagnosis and substantial healthcare costs. A multi-institutional collaborative team led by Professor Ng Siew-chien, Department of Medicine and Therapeutics at CU Medicine, will develop a novel, universal bacteria marker panel to predict CD and its complications, and devise a multi-tier algorithm incorporating microbial markers and food additives to provide an innovative non-invasive approach to early diagnosis and prediction of CD complications. The team will work closely with industry collaborators to translate the technologies into cost-effective, convenient products that enhance the care of patients with CD globally and benefit society.

2. **Professor Edward Ng Yan-yung**, Yao Ling Sun Professor of Architecture, School of Architecture
Project title: **Increasing the resilience to the health impacts of extreme cold weather on the older population under future climate change**

With climate change, the weather will fluctuate more in the future, with hot days getting hotter and cold days getting colder. Professor Edward Ng from CUHK School of Architecture will carry out research on extreme cold weather in Hong Kong. Combined with his understanding of extreme heat from an earlier study, he will assess the impact of extreme heat and extreme cold weather on the health of the older population, and develop a comprehensive plan with better urban planning and building design in response. This study will provide a methodological framework for incorporating scientific knowledge about extreme temperatures and their impacts to safeguard the health and well-being of elderly people. The findings of the study will help the Hong Kong Observatory transform its current weather information system into a more comprehensive one that is capable of reflecting conditions in different districts in a timely manner; formulate guidelines for urban planners, architects, developers and other industry professionals to build a sustainable, healthy city under the vision of Hong Kong's Climate Action Plan 2030+ and Hong Kong's Climate Action Plan 2050; and develop housing protocols to better cater to elderly people's needs under extreme weather conditions.

3. **Professor Ren Hongliang**, Associate Professor, Department of Electronic Engineering
Project title: **Robotic endobronchial multi-modal biopsy of pulmonary nodules**

Lung cancer is one of the most dangerous cancers worldwide, with about 2 million new cases and 1.8 million deaths per annum. Early detection and early intervention are the best way to prevent and treat the disease. The main monitoring methods used presently are computed tomography imaging and mechanical biopsy, with which it is difficult to locate nodules in situ, and which involve extensive pain and additional cost and time. A cross-institutional team led by Professor Ren Hongliang at CUHK's Department of Electronic Engineering will study the key optical, mechanical and electrochemical principles in microsampling and bioassays for lung cancer biomarker monitoring in situ, and develop flexible microfluidic multiplexed immune-sensing arrays that can enter narrow, curvy airway branches for multi-modal microbiopsy and bioassay in situ around small pulmonary nodules. This project will facilitate profiling of the tumour microenvironment in vivo in lungs under fine microstructural imaging guidance in situ, and contribute to addressing the unmet clinical needs mentioned above.

4. **Professor Cindy Sit Hui-ping**, Chairperson, Department of Sports Science and Physical Education

Project title: **Battling sedentarism in children with special educational needs through inclusive physical activity**

During the COVID-19 pandemic, the global trend of “sedentarism” has become more serious. Sedentarism refers to sitting for a long time and a lack of physical activity, which are associated with premature death and non-communicable diseases such as cardiovascular disease, as well as poor physical and mental health. The World Health Organization (WHO) recommends that children and adolescents around the world engage in moderate-to-vigorous physical activity for an average of 60 minutes a day, while reducing sedentary behaviour, but over 80% of children with disabilities or special educational needs (SEN) do not meet the recommendations. A team led by Professor Cindy Sit at CUHK's Department of Sports Science and Physical Education will examine the effects of an “inclusive physical activity” (IPA) programme on the physical activity, sedentary behaviour and physical and mental health of SEN children. Children will be randomly allocated either to an IPA condition or a control condition to explore the effects of IPA on improving their physical and mental health. It will be the first project to put the WHO recommendations on both physical activity and sedentary behaviour into practice.