

Non-alcoholic Fatty Liver Disease

Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease worldwide and has emerged as an important cause of cirrhosis and liver cancer. Working in collaboration with radiologists, endocrinologists, surgeons, pathologists, basic scientists and dietitians, our group is interested in the epidemiology, natural history, diagnosis and treatment of NAFLD. We have conducted population studies using proton-magnetic resonance spectroscopy and transient elastography to define the local epidemiology. We have also participated in global multicentre studies to evaluate new therapeutics for this condition.

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Gastroenterology and Hepatology

Digestive diseases have always been a major threat to global health. In particular, cancers in the stomach, colon and liver persistently rank among the top cancer killers in the world. The Gastroenterology and Hepatology Division has a strong culture of excellence and a tradition of inter-disciplinary collaboration with surgeons, molecular biologists, pharmacologists, pathologists, microbiologists, psychiatrists, public health specialists and radiologists. Together, we have contributed to major breakthroughs that have improved the clinical management of digestive diseases. These include the advent of endoscopic therapies, research on molecular diagnostic tools for cancers, and the development of novel treatments for acid-peptic disease and viral hepatitis. Our achievements have been recognised at both the national and international level.



DEPARTMENT OF MEDICINE AND THERAPEUTICS GASTROENTEROLOGY AND HEPATOLOGY

Gut Microbiota

The study of gut microbiota has become important for many gastrointestinal and systemic diseases. Using next-generation sequencing and bioinformatics, our team was among the first to describe the metagenomic landscape in colorectal cancer and *Clostridium difficile* infection. Our work has also led to a new understanding of disease mechanisms and the discovery of several diagnostic biomarkers. Furthermore, our team pioneered the use of faecal microbiota transplantation in Asia and led several clinical trials to study its efficacy in treating various diseases. This exciting translational and clinical research will change our understanding and management of diseases.

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“Through high quality research and international collaborations, we strive to contribute to science and benefit our patients.”

Vincent Wai Sun WONG
Head of Division

Gastrointestinal Cancers

Gastrointestinal (GI) cancers (e.g. gastric, liver and colorectal cancers) account for 40% of all cancer mortalities in China and remain the leading cause of cancer-related death. The State Key Laboratory of Digestive Disease at CUHK consists of a world-leading team of scientists and clinicians specialised in GI cancer and its related diseases. Our work includes the delineation of the molecular pathogenesis, novel diagnostic biomarkers and therapeutic targets of GI cancers.

We have pioneered the genomic and microbial landscape of GI cancers in the Chinese population and discovered over 20 novel tumour suppressive and promoting genes. We were also the first in the world to define the stool microRNA and bacterial biomarkers for the early diagnosis of colorectal cancer. As the holder of numerous patents of cancer biomarkers, we have partnered with the industry to put our scientific discoveries into clinical translation.

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Functional Gastrointestinal Disorders

Functional gastrointestinal disorders such as irritable bowel syndrome, functional dyspepsia and gastroesophageal reflux disease affect numerous people in the community and are a major morbidity. Our group is interested in the mechanism, biomarkers, psychiatric morbidity and treatment of functional gastrointestinal disorders.

We established the Integrative Medical Centre as a platform for conducting clinical trials and studying healthcare models of integrative medicine. Moreover, we were the first to demonstrate that obesity is associated with increased transient lower oesophageal sphincter relaxation before patients develop clinical reflux symptoms. We also conducted one of the largest clinical trials on the effect of *Helicobacter pylori* eradication on the symptoms of gastroesophageal reflux disease.

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Viral Hepatitis

Chronic hepatitis B is the leading cause of cirrhosis and liver cancer in Asia. Our group focuses on the natural history, biomarker discovery and treatment of this disease. Among our achievements, we pioneered the study of cccDNA and use of hepatitis B surface antigen level to predict clinical outcomes and therapeutic response. We also developed the CU-HCC score to predict the 10-year risk of liver cancer and led numerous multicentre phase 1-4 pivotal clinical trials for viral hepatitis B.

Our centre is accredited by the China Food and Drug Administration for conducting registration clinical trials for new pharmaceutical agents. Members of our group have won numerous research-related awards, such as the National Science and Technology Progress Award and the First-Class MOE Higher Education Outstanding Scientific Output Award.

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Peptic Ulcer Disease from Aspirin and NSAIDs

Aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) are among the most commonly prescribed drugs but also the most common cause of peptic ulcer complications in developed countries. Our group has conducted a series of landmark clinical trials to define the optimal management of this condition. Through these trials, we showed that eradication of *Helicobacter pylori* can reduce the risk of recurrent peptic ulcer bleeding from aspirin and NSAID use and established the role of a proton pump inhibitor for ulcer prophylaxis. The use of the cyclooxygenase-2 inhibitor plus proton pump inhibitor has now become the standard of care for patients who are at very high risk of peptic ulcers but require potent analgesics.

Our group has published numerous ground-breaking papers in the *New England Journal of Medicine* and *The Lancet* and authored all review articles on peptic ulcer disease for *The Lancet*.

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Non-invasive Tests of Liver Fibrosis

Liver fibrosis develops with repeated or ongoing liver injury in chronic liver diseases. For the assessment of liver fibrosis, a liver biopsy is traditionally required but this is invasive and poorly accepted by patients. We responded by pioneering the use of transient elastography to measure liver stiffness in patients with chronic liver diseases and were the first to validate the test against computer morphometry. We have also used the test to study the epidemiology and natural history of chronic hepatitis B and non-alcoholic fatty liver disease. Additionally, we developed algorithms to define the interpretation of liver stiffness values and a risk score based on transient elastography to predict the risk of liver cancer.

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Inflammatory Bowel Disease

The incidence of inflammatory bowel disease (IBD, including Crohn's disease and ulcerative colitis) is rising rapidly in Asia. Our group is interested in the epidemiology, natural history, genetics, microbiota, and management of inflammatory bowel disease. Achievements by our group include pioneering the Asia-Pacific Crohn's and Colitis Epidemiologic Study Group (www.access-apibd.com) and developing the largest prospective dataset that tracks IBD cases in 15 countries across the region. We have since highlighted several environmental exposures and microbial factors as potential targets for modulation.

Our IBD research team (www.cuhkibd.org) collaborates with key institutions in Europe, the USA and Australia in basic science, translational and clinical studies to identify early life microbial trigger and dietary impact on IBD. We also lead multicentre trials to address relevant challenges, including the risk of tuberculosis, de-escalation therapy and the role of alternative therapies.

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