

Any opinions, findings, conclusions or recommendations expressed in this event / publication (or by members of this State Key Laboratory) do not reflect the views of the Government of the Hong Kong Special Administrative Region or the Innovation and Technology Commission.

Enquiry

State Key Laboratory of Liver Research (The University of Hong Kong)

Room 7-01, 7/F,
Hong Kong Jockey Club Building for Interdisciplinary Research,
The University of Hong Kong,
5 Sassoon Road, Pokfulam, Hong Kong

Tel: (852) 2831 5440 / 2831 5528
Fax: (852) 2218 5210
Email: sklrr@hku.hk

Design by www.kemsign.com.hk Tel. 2866 7418

PROGRAM BOOK

Symposium 2024

State Key Laboratory of Liver Research (HKU)
RGC Theme-based Research Scheme Project on Translations to
Enhance Liver Cancer Management

Date: 26 October 2024 (Saturday)

Time: 9:00 am to 4:30 pm

Venue: Concord Room, Renaissance Harbour View Hotel Hong Kong

Organized by



Supported by



Platinum Sponsor



Silver Sponsor



Bronze Sponsor





METASTATIC NON-SMALL CELL LUNG CANCER (NSCLC)

IMFINZI®
英飛凡®
(durvalumab)

IMFINZI®
英飛凡®
(durvalumab)



IMFINZI in combination with **gemcitabine and cisplatin** is indicated for the first-line treatment of adult patients with **locally advanced** or **metastatic biliary tract cancer** (BTC).¹

IMFINZI®
英飛凡®
(durvalumab)

[illegible]

AstraZeneca
阿斯利康



AstraZeneca Hong Kong Limited
Unit 1-3, 11/F, China Taiping Finance Centre,
18 King Wah Road, North Point, Hong Kong
Tel: (852) 2420 7388 Fax: (852) 2422 6788

IMFINZI®
英飛凡®
(durvalumab)

IMJUDO®
(tremelimumab)
Concentrate for Solution for
Infusion



NEW ENGLAND
BioLabs

SARTORIUS

TECAN.

T W I S T




SPL
SPL LIFE SCIENCE



ELITechGroup
EMPOWERING IVD

 Sales@bioarrow.com

 2179 7193

Inhibitors • Screening Libraries • Proteins

80,000+ High Purity
Small Molecules

- 

60,000+ High Activity
Biological Large
Molecules

- 

MCE One-Stop Drug Screening Platform

- **Compound Libraries**
 - Ready-to-Use Compound Libraries
 - Diversity Compound Libraries
 - Fragment Libraries, etc.
 - Customized Libraries
- **Screening Services**
 - Virtual Screening
 - DEL Screening
 - SPR Assay Service, etc.
 - Lead Compound Optimization



High Efficiency
Biological Kits

- Inhibitor Cocktails
- RT/qPCR & PCR Master Mix
- Magnetic Beads & Agarose
- Protein Biology
- 2D/3D Cell Culture
- Cell Analysis

**Come to our booth and bring
MCE GIFTS home!**



Peer Scientists Recognition –

Cited in 40,000+ Publications
Including CNS Series

MedChemExpress USA

Tel: 609-228-6898

E-mail: sales@MedChemExpress.com

Tech Support: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA

MedChemExpress Asia & Pacific

www.MedChemExpress.com

Welcome from the Director of SKLLR (HKU) and Project Coordinator of RGC TRS project



On behalf of the State Key Laboratory of Liver Research (SKLLR) of HKU and as the Project Coordinator of the Theme-based Research Scheme (TRS) grant, I would like to express my sincere gratitude and warmly welcome you to this Joint 13th Symposium of SKLLR and TRS.

Established in June 2010, the SKLLR aims to reduce the incidence and mortality of hepatitis and liver diseases in Hong Kong, Mainland China and around the region through vigorous basic and translational research programs and meticulous clinical care.

For the TRS project (2023-2027) on 'Delineating and translating the mechanistic determinants to improve the clinical management of liver cancer' funded by HK Research Grants Council, the second TRS award we have obtained, the team aims to generate unique information for evidence-based translational application to improve the diagnosis and treatment outcome for patients with liver cancer.

To promote knowledge exchange with the scientific research and clinical community, we jointly hold an annual symposium on advances in liver research and liver diseases. This current Symposium features a very strong program, assembling the presentations of SKLLR and TRS research teams and internationally renowned experts to share their cutting-edge research and new basic and clinical developments on liver diseases. We are deeply honored and privileged to have Professor Mohammed ESLAM (Professor of Hepatology and Deputy Director, Storr Liver Centre, University of Sydney, Australia) and Professor Qiang GAO (Deputy Director and Professor, Department of Liver Surgery and Transplantation, Liver Cancer Institute, Zhongshan Hospital, Fudan University, Shanghai, China) as our Keynote Speakers.

I wish you an inspirational and rewarding day with us.

Finally, I would like to express my sincere thanks to the organizing committee and speakers for their wonderful contributions, and the sponsors for their generous support. Their contributions have made this Symposium a success.

Irene Oi-Lin Ng

MBBS (HK), MD (HK), PhD (HK), FRCPath, FHKCPath, FHKAM (Pathology), FAASLD
Director, State Key Laboratory of Liver Research & Project Coordinator, TRS
The University of Hong Kong

Welcome from the Chairpersons



On behalf of the Organizing Committee of Symposium 2024 of State Key Laboratory of Liver Research (SKLLR) and RGC Theme-based Research Scheme Project on Translations to Enhance Liver Cancer Management, we warmly welcome everyone to the 13th Symposium of SKLLR / TRS.

The Symposium features a comprehensive program ranging from basic research to clinical applications on the latest development of liver diseases. It brings together the research team members of SKLLR as along with other local and overseas experts to share cutting-edge research and new clinical developments in liver diseases. We are much honored to have Professor Qiang GAO from Fudan University, China, as our Keynote Speaker for the basic research session. He will present on "Multi-omics characterization of intrahepatic cholangiocarcinoma reveals new treatment opportunity", and "A pan-cancer single cell profiling of tumor neutrophils identifies antigen presentation potency". For the Keynote lectures in clinical sessions, we are equally honored to welcome Professor Mohammed ESLAM from the University of Sydney, Australia. He will deliver presentations on "Lean MAFLD", and "NAFLD, MAFLD or MASLD?"

It is the wish of the Organizing Committee that today's Symposium will continue to deliver significant discoveries and foster understanding and collaboration among researchers. We have succeeded in assembling an outstanding panel of speakers, and we hope you find the sessions both stimulating and fulfilling.

Last but not the least, we would like to express our heartfelt gratitude to all speakers and our generous sponsors: Platinum Sponsor (AstraZeneca Hong Kong Ltd.), Silver Sponsors (BioArrow Technology Ltd. and MedChemExpress), Bronze Sponsor (AbbVie Ltd.), and logo acknowledgement (Thermo Fisher Scientific Hong Kong). Their generous support has significantly contributed to the success of this Symposium.

Walter Wai-Kay SETO

MBBS(HK), MD(HK), MRCP (UK), FRCP (Edin, Glasg, Lond), FHKCP, FHKAM (Medicine)

Chairperson (Clinical)
Organizing Committee of
Symposium 2024 of SKLLR



Judy Wai-Ping YAM

BSc (Washington), MSc (HK), PhD (HK)
Chairperson (Basic)

Chairperson (Clinical)
Organizing Committee of
Symposium 2024 of SKLLR

Background and Mission

Liver disease due to hepatitis B virus (HBV) infection, end-stage liver disease (cirrhosis) and liver cancer remains one of the leading causes of morbidity and mortality in Hong Kong and in parts of the Mainland. Our mission is to enhance our understanding in the pathogenetic mechanisms of HBV, cirrhosis and liver cancer by engaging in cutting-edge basic laboratory research, and devise better diagnoses and new/better treatment modalities for HBV infection and liver cancer. The long-term objective is to reduce the incidence and mortality of hepatitis and liver diseases in Hong Kong, by offering our patients the best possible management and treatments. Through vigorous basic and translational research programs and meticulous clinical care, we are striving to establish a world-class State Key Laboratory of Liver Research of the highest standard in Hong Kong, Mainland and around the region for better prevention, more accurate diagnosis and more effective treatments for liver diseases.

Organizing Committee of Joint-SKLLR & TRS Symposium 2024

CHAIRPERSONS

Professor Walter Wai-Kay SETO
Department of Medicine
The University of Hong Kong

Professor Judy Wai-Ping YAM
Department of Pathology
The University of Hong Kong

MEMBERS

Professor Albert Chi-Yan CHAN
Department of Surgery
The University of Hong Kong

Dr James Yan-Yue FUNG
Department of Medicine
Queen Mary Hospital

Professor Xin-Yuan GUAN
Department of Clinical Oncology
The University of Hong Kong

Professor Daniel Wai-Hung HO
Department of Pathology
The University of Hong Kong

Professor Dong-Yan JIN
School of Biomedical Sciences
The University of Hong Kong

Professor Stephanie Kwai-Yee MA
School of Biomedical Sciences
The University of Hong Kong

Professor Irene Oi-Lin NG
Department of Pathology
The University of Hong Kong

Professor Carmen Chak-Lui WONG
Department of Pathology
The University of Hong Kong

Professor Jack Chun-Ming WONG
Department of Pathology
The University of Hong Kong

Professor Man-Fung YUEN
Department of Medicine
The University of Hong Kong

People of State Key Laboratory of Liver Research (The University of Hong Kong)

DIRECTOR

Professor Irene Oi-Lin NG
Department of Pathology
The University of Hong Kong

DEPUTY DIRECTORS

Professor Xin-Yuan GUAN
Department of Clinical Oncology
The University of Hong Kong

Professor Dong-Yan JIN
School of Biomedical Sciences
The University of Hong Kong

Professor Man-Fung YUEN
Department of Medicine
The University of Hong Kong

PRINCIPAL INVESTIGATORS

Professor Albert Chi-Yan CHAN
Department of Surgery
The University of Hong Kong

Professor Tan-To CHEUNG
Department of Surgery
The University of Hong Kong

Dr James Yan-Yue FUNG
Department of Medicine
Queen Mary Hospital

Professor Daniel Wai-Hung HO
Department of Pathology
The University of Hong Kong

Professor Peng-Tao LIU
School of Biomedical Sciences
The University of Hong Kong

Dr Regina Cheuk-Lam LO
Department of Pathology
The University of Hong Kong

Professor Ken Hoi-Tang MA
Department of Pathology
The University of Hong Kong

Professor Stephanie Kwai-Yee MA
School of Biomedical Sciences
The University of Hong Kong

Professor Loey Lung-Yi MAK
Department of Medicine
The University of Hong Kong

Professor Kwan MAN
Department of Surgery
The University of Hong Kong

Professor Walter Wai-Kay SETO
Department of Medicine
The University of Hong Kong

Professor Carmen Chak-Lui WONG
Department of Pathology
The University of Hong Kong

Professor Jack Chun-Ming WONG
Department of Pathology
The University of Hong Kong

Dr Danny Ka-Ho WONG
Department of Medicine
The University of Hong Kong

Professor Judy Wai-Ping YAM
Department of Pathology
The University of Hong Kong

Professor Thomas Chung-Cheung YAU
Department of Medicine
The University of Hong Kong

ASSOCIATE MEMBERS

Dr Chi-Ping CHAN
School of Biomedical Sciences
The University of Hong Kong

Professor Chi-Leung CHIANG
Department of Clinical Oncology
The University of Hong Kong

Professor Clive Yik-Sham CHUNG
School of Biomedical Sciences
The University of Hong Kong

Professor Heidi Guang-Sheng LING
School of Biomedical Sciences
The University of Hong Kong

Dr Yu-Man TSUI
Department of Pathology
The University of Hong Kong

Dr Eric Tin-Lok WONG
School of Biomedical Sciences
The University of Hong Kong

Time	Session
09:00 - 09:05	Opening Address: Professor Judy Wai-Ping Yam
Session Chairpersons: Professor Dong-Yan JIN and Professor Xin-Yuan GUAN	
09:05 - 09:25	Basic Young 1 Ms Yiling CHEN PhD Student, Department of Pathology, HKU Topic: The mevalonate pathway promotes liver cancer
09:25 - 09:45	Basic Young 2 Dr Vanilla Xin ZHANG Postdoctoral Fellow, Department of Pathology, HKU Topic: Targeting the oncogenic m6A demethylase FTO suppresses tumorigenesis and potentiates immune response in hepatocellular carcinoma
09:45 - 10:05	Basic Young 3 Dr Yu-Man TSUI Research Assistant Professor, Department of Pathology, HKU Topic: Sorted-cell sequencing on HCC specimens reveals a key player in CD24/CD13/EpCAM-triple positive, stemness-related HCC cells
10:05 - 10:45	Basic Keynote 1 Professor Qiang GAO, MD, PhD Deputy Director and Professor, Department of Liver Surgery and Transplantation, Liver Cancer Institute, Zhongshan Hospital, Fudan University, Shanghai, China Topic: A pan-cancer single cell profiling of tumor neutrophils identifies antigen presentation potency
10:45 - 11:10	Tea Break
Session Chairpersons: Professor Carmen Chak-Lui WONG and Professor Ken Hoi-Tang MA	
11:10 - 11:30	Basic Presentation 1 Professor Stephanie Kwai-Yee MA Professor, School of Biomedical Sciences, HKU Topic: Discovery of potential therapies for CTNNB1 mutation-driven hepatocellular carcinoma using a genetically defined, syngeneic mouse organoid platform
11:30 - 11:50	Basic Presentation 2 Professor Clive Yik-Sham CHUNG Assistant Professor, School of Biomedical Sciences, HKU Topic: Chemoproteomics-driven identification of new druggable hotspots in cancers and discovery of anticancer covalent ligands
11:50 - 12:10	Basic Presentation 3 Professor Judy Wai-Ping YAM Professor, Department of Pathology, HKU Topic: Unraveling the uptake mechanisms of small extracellular vesicles and their significance in hepatocellular carcinoma

Time	Session
12:10 - 13:35	Lunch
Session Chairpersons: Dr James Yan-Yue FUNG and Professor Jack Chun-Ming WONG	
13:35 - 14:05	Basic Keynote 2 Professor Qiang GAO, MD, PhD Deputy Director and Professor, Department of Liver Surgery and Transplantation, Liver Cancer Institute, Zhongshan Hospital, Fudan University, Shanghai, China Topic: Multi-omics characterization of intrahepatic cholangiocarcinoma reveals new treatment opportunity
14:05 - 14:35	Clinical Keynote 1 Professor Mohammed ESLAM, MD, MSc, PhD Professor of Hepatology and Deputy Director, Storr Liver Centre, University of Sydney, Sydney, Australia Topic: NAFLD, MAFLD or MASLD?
14:35 - 14:55	Clinical Presentation 1 Professor Walter Wai-Kay SETO Clinical Professor, Department of Medicine, HKU Topic: The gut microbiome and liver disease: A genuine link?
14:55 - 15:20	Tea Break
Session Chairpersons: Professor Walter Wai-Kay SETO and Dr Regina Cheuk-Lam LO	
15:20 - 15:45	Clinical Keynote 2 Professor Mohammed ESLAM, MD, MSc, PhD Professor of Hepatology and Deputy Director, Storr Liver Centre, University of Sydney, Sydney, Australia Topic: Lean MAFLD
15:45 - 16:05	Clinical Presentation 2 Professor Thomas Chung-Cheung YAU Clinical Associate Professor, Department of Medicine, HKU Topic: Anti CTLA 4 in advanced hepatocellular carcinoma
16:05 - 16:25	Clinical Presentation 3 Professor Albert Chi-Yan CHAN Clinical Professor, Department of Surgery, HKU Topic: Combining immunotherapy in surgical oncology: Current research and future perspectives
16:25 - 16:30	Closing remarks: Professor Walter Wai-Kay Seto

Keynote Lecture I



Professor Dong-Yan JIN

Professor
School of Biomedical Sciences, HKU



Professor Xin-Yuan GUAN

Chair Professor
Department of Clinical Oncology,
School of Clinical Medicine, HKU

Keynote Speaker



Professor Qiang GAO

Deputy Director and Professor,
Department of Liver Surgery and Transplantation,
Liver Cancer Institute, Zhongshan Hospital,
Fudan University,
Shanghai, China

A pan-cancer single cell profiling of tumor neutrophils identifies antigen presentation potency

Neutrophils, the most abundant and efficient defenders against pathogens, exert opposing functions across cancer types. However, given their short half-life, it remains challenging to explore how neutrophils adopt specific fates in cancer. Here, we generated and integrated single-cell neutrophil transcriptomes from 17 cancer types (225 samples from 143 patients). Neutrophils exhibited extraordinary complexity, with 10 distinct states including inflammation, angiogenesis, and antigen presentation. Notably, the antigen-presenting program was associated with favorable survival in most cancers and could be evoked by leucine metabolism and subsequent histone H3K27ac modification. These neutrophils could further invoke both (neo)antigen-specific and antigen-independent T cell responses. Neutrophil delivery or a leucine diet fine-tuned the immune balance to enhance anti-PD-1 therapy in various murine cancer models. In summary, these data not only indicate the neutrophil divergence across cancers but also suggest therapeutic opportunities such as antigen-presenting neutrophil delivery.

Keynote Lecture II



Dr James Yan-Yue FUNG

Consultant
Department of Medicine,
Queen Mary Hospital and
Honorary Clinical Associate Professor
Department of Medicine,
School of Clinical Medicine, HKU



Professor Jack Chun-Ming WONG

Professor
Department of Pathology,
School of Clinical Medicine, HKU

Keynote Speaker

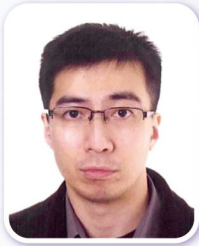


Professor Qiang GAO

Deputy Director and Professor,
Department of Liver Surgery and Transplantation,
Liver Cancer Institute, Zhongshan Hospital,
Fudan University,
Shanghai, China

Multi-omics characterization of intrahepatic cholangiocarcinoma reveals new treatment opportunity

We performed proteogenomic characterization of intrahepatic cholangiocarcinoma (iCCA) using paired tumor and adjacent liver tissues from 262 patients. Integrated proteogenomic analyses prioritized genetic aberrations and revealed hallmarks of iCCA pathogenesis. Aflatoxin signature was associated with tumor initiation, proliferation, and immune suppression. Mutation-associated signaling profiles revealed that TP53 and KRAS co-mutations may contribute to iCCA metastasis via the integrin-FAK-SRC pathway. FGFR2 fusions activated the Rho GTPase pathway and could be a potential source of neoantigens. Proteomic profiling identified four patient subgroups (S1–S4) with subgroup-specific biomarkers. These proteomic subgroups had distinct features in prognosis, genetic alterations, microenvironment dysregulation, tumor microbiota composition, and potential therapeutics. SLC16A3 and HKDC1 were further identified as potential prognostic biomarkers associated with metabolic reprogramming of iCCA cells. This study provides a valuable resource for researchers and clinicians to further identify molecular pathogenesis and therapeutic opportunities in iCCA.



Dr James Yan-Yue FUNG

Consultant
Department of Medicine,
Queen Mary Hospital and
Honorary Clinical Associate Professor
Department of Medicine,
School of Clinical Medicine, HKU



Professor Jack Chun-Ming WONG

Professor
Department of Pathology,
School of Clinical Medicine, HKU

Keynote Speaker



Professor Mohammed ESLAM

Professor of Hepatology and Deputy Director,
Storr Liver Centre,
University of Sydney,
Sydney, Australia

NAFLD, MAFLD or MASLD?

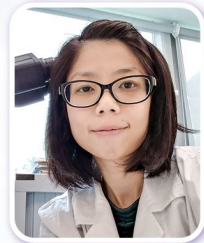
The year 2020 marked a watershed for Hepatology with the redefinition of fatty liver disease related to metabolic dysfunction. The term metabolic dysfunction-associated fatty liver disease (MAFLD) was introduced, and a new classification was created to better reflect the underlying causes of the disease. These criteria have been extensively validated with unequivocal evidence suggesting that it has superior utility for identifying adverse hepatic and extrahepatic outcomes, it deconvolutes disease heterogeneity by capturing homogenous groups of patients who fit into one of three well-characterised subgroups, and ultimately brings the disease back under the umbrella of the metabolic health spectrum. These changes are not only important for clinical research studies, but also for daily clinical practice. They are simple to use in clinical practice, even in resource-limited settings, which is crucial for widespread acceptance given how common this disorder is. More recently, an adapted version of the MAFLD term and diagnostic criteria, namely metabolic dysfunction-associated steatotic liver disease (MASLD) has been proposed. The changes

in the MASLD criteria compared to the validated MAFLD criteria include “liberalized” requirements for evidence of metabolic dysfunction to a single criterion instead of two for lean individuals. Additionally, some alterations in the used metabolic risk factor cut-offs, an aspect that was highlighted recently to have significant implications, particularly among the paediatric population was proposed. Both definitions also addressed the coexistence of the disease with other liver disease aetiologies differently. The SLD definition introduces a new term “MetALD” to describe patients with MASLD and excessive alcohol intake, with no other term for MASLD coexisting with any other cause. On the other hand, the MAFLD definition refrains from introducing a new term and instead includes the concept of dual etiologies, covering the coexistence of MAFLD with any other cause, including excessive alcohol intake. The talk will illustrate the similarities and differences between the various diagnostic criteria and the current evidence of their utility. I will also briefly touch on the future prospects and the way forward.



Professor Walter Wai-Kay SETO

Clinical Professor
Department of Medicine,
School of Clinical Medicine, HKU



Dr Regina Cheuk-Lam LO

Clinical Associate Professor
Department of Pathology,
School of Clinical Medicine, HKU

Keynote Speaker



Professor Mohammed ESLAM

Professor of Hepatology and Deputy Director,
Storr Liver Centre,
University of Sydney,
Sydney, Australia

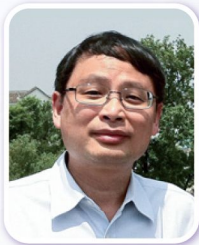
Lean MAFLD

Excessive calorie consumption relative to expenditure, intake of unhealthy diets, and lack of physical activity are globally fuelling an increase in the prevalence of poor metabolic health, even in individuals of normal weight. Consequently, this trend entails increased risk of various metabolic disorders, including metabolic associated fatty liver disease (MAFLD), which affects up to a third of the global population.

MAFLD burden has grown in parallel with rising rates of type 2 diabetes and obesity and increases the risk of end-stage liver disease, hepatocellular carcinoma, death, and liver transplantation, and has extrahepatic consequences including cardiometabolic disease and cancers. Although classically is associated with obesity, there is accumulating evidence that not all overweight or obese develop fatty liver disease. On the other hand, a considerable proportion of patients with MAFLD are lean, indicating the importance of metabolic health in disease pathogenesis regardless of body mass index. A complex and dynamic interaction

between a multitude of factors, including genetic, epigenetic, dietary, and lifestyle factors, enterohepatic circulation, and gut microbiota is likely to shape individual metabolic health status.

The clinical profile, natural history and pathophysiology of lean patients with MAFLD is not well characterised. In this talk, I am going to provide the recent epidemiological data on this group of patients. The talk will illustrate the novel concept considering the overall metabolic health and metabolic adaptation as a framework to best explain the pathogenesis of MAFLD and its heterogeneity, both in lean and non-lean individuals. This framework provides a conceptual schema for interrogating the MAFLD phenotype in lean individuals that can translate to novel approaches for diagnosis and patient care. I will also touch briefly on the prospective aspects including the initiatives bringing together diverse stakeholders across the metabolic disease spectrum that are pivotal in our efforts to firstly understand and then to provide personalized, timely, equitable and affordable health interventions for lean patients with MAFLD.



Professor Dong-Yan JIN

Professor
School of Biomedical Sciences, HKU



Professor Xin-Yuan GUAN

Chair Professor
Department of Clinical Oncology,
School of Clinical Medicine, HKU

Speakers



Ms Yiling CHEN

PhD Student,
Department of Pathology,
School of Clinical Medicine, HKU

The mevalonate pathway promotes liver cancer

Ferroptosis is a novel form of regulated cell death triggered by iron-induced lipid peroxidation. The GPX4/glutathione and FSP1/Coenzyme Q10 systems are primary defense mechanisms against ferroptosis, neutralizing toxic lipid peroxides to prevent cell death. Our multi-omics screening has identified Mevalonate diphosphate decarboxylase (MVD), a crucial enzyme in the Mevalonate (MVA) pathway, as essential for hepatocellular carcinoma (HCC) survival and ferroptosis protection. MVD safeguards HCC from ferroptosis through two mechanisms: producing the antioxidant CoQ10 to eliminate oxidized lipids and facilitating the translation of the selenoprotein GPX4 by generating isopentenyl pyrophosphate (IPP), necessary for N6-isopentenyladenosine (i6A) modification of selenocysteine-tRNA. Selenoproteins are unique due to their selenium component, incorporated as selenocysteine, which is recoded by the stop codon UGA and delivered via selenocysteine-tRNA. The IPP-dependent i6A modification is crucial for the stability and function of selenocysteine-tRNA. Inhibition of MVD, either genetically or pharmacologically, disrupts CoQ10 synthesis and causes ribosome stalling during GPX4 translation. Furthermore, knocking out TRSP and TRIT1, encoding the selenocysteine-tRNA and the i6A modifying enzyme respectively, impairs selenoprotein translation and induces ferroptosis in HCC. Our study reveals that the MVA pathway supports liver cancer resistance to ferroptosis through CoQ10 production and selenoprotein translation, highlighting MVD as a valuable prognostic marker and therapeutic target in HCC.



Dr Vanilla Xin ZHANG

Postdoctoral Fellow,
Department of Pathology,
School of Clinical Medicine, HKU

Targeting the oncogenic m6A demethylase FTO suppresses tumorigenesis and potentiates immune response in hepatocellular carcinoma

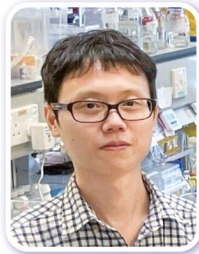
Objective: Fat Mass and Obesity-associated protein (FTO), an eraser of N6-methyladenosine (m6A), plays oncogenic roles in various cancers. However, its role in hepatocellular carcinoma (HCC) is unclear. Furthermore, small extracellular vesicles (sEVs, or exosomes) are critical mediators of tumorigenesis and metastasis, but the relationship between FTO-mediated m6A modification and sEVs in HCC is unknown.

Design: The functions and mechanisms of FTO and Glycoprotein Nonmetastatic Melanoma Protein B (GPNMB) in HCC progression were investigated in vitro and in vivo. Neutralizing antibody of syndecan-4 (SDC4) was used to assess the significance of sEV-GPNMB. FTO inhibitor CS2 was used to examine the effects on anti-PD1 and sorafenib treatment.

Results: FTO expression was up-regulated in patient HCC tumors. Functionally, FTO promoted HCC cell proliferation, migration, and invasion in vitro, and tumor growth and metastasis in vivo. FTO knockdown enhanced the activation and recruitment of tumor-infiltrating CD8+ T cells. Furthermore, we identified GPNMB to be a downstream target of FTO, which reduced the m6A abundance of GPNMB, hence stabilizing it from degradation by YTHDF2. Of note, GPNMB was packaged into sEVs derived from HCC cells and bound to the surface receptor SDC4 of CD8+ T cells, resulting in the inhibition of CD8+ T cell activation. A potential FTO inhibitor, CS2, suppresses the oncogenic functions of HCC cells and enhances the sensitivity of anti-PD1 and sorafenib treatment.

Conclusion: Targeting the FTO/m6A/GPNMB axis could significantly suppress tumor growth and metastasis, and enhance immune activation, highlighting the potential of targeting FTO signalling with effective inhibitors for HCC therapy.

Young Researcher Presentations



Dr Yu-Man TSUI

Research Assistant Professor,
Department of Pathology,
School of Clinical Medicine, HKU

Sorted-cell sequencing on HCC specimens reveals a key player in CD24/CD13/EpCAM-triple positive, stemness-related HCC cells

Hepatocellular carcinoma (HCC) is a heterogeneous cancer with varying levels of liver cancer stem cells (LCSCs) in the tumors. We aimed to investigate the expression of different LCSC markers in human HCCs to identify their regulatory mechanisms in stemness-related HCC cells.

We performed a comprehensive, unbiased examination of LCSC markers on a total of 60 HCC resected specimens by flow cytometry. Significant heterogeneity was found in the expression of LCSC markers, CD24, CD13, and EpCAM. Concomitant expression of CD24, CD13 and EpCAM was detected in 32 HCC samples, and this was associated with advanced tumor stages. By fluorescence-activated cell-sorting (FACS), we sorted HCC cells for the three individual LCSC markers to perform subsequent transcriptomic analyses. There were diverse associated signaling pathways with only a low degree of overlapping among the different individual LCSC markers. Moreover, we identified EPS8L3 as a common gene associated with the three markers. Functionally, knockdown of EPS8L3 suppressed the expression of all the three LCSC markers in HCC cells. Multi-color immunofluorescence showed HCC cells with co-expression of the three LCSC markers and EPS8L3 in the clinical specimens. To search for the upstream regulation of EPS8L3, we found SP1 bound to EPS8L3 promoter to drive EPS8L3 expression. Lastly, using Akt inhibitor MK2206, we showed that Akt-signaling-driven SP1 drove the expression of these three LCSC markers.

Our findings provide insight into potential LCSC-targeting therapeutic strategies by offering a proof-of-concept support to suppress the upstream transcription regulatory machineries in a collective manner.

Basic Research Presentations



Professor Carmen Chak-Lui WONG

Associate Professor
Department of Pathology,
School of Clinical Medicine, HKU



Professor Ken Hoi-Tang MA

Assistant Professor
Department of Pathology,
School of Clinical Medicine, HKU

Speakers

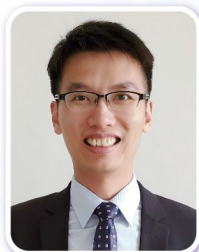


Professor Stephanie Kwai-Yee MA

Professor,
School of Biomedical Sciences, HKU

Discovery of potential therapies for CTNNB1 mutation-driven hepatocellular carcinoma using a genetically defined, syngeneic mouse organoid platform

Hepatocellular Carcinoma (HCC) is a disease with diverse cells and distinct molecular signatures, resulting in a complex and heterogeneous nature. The traditional 'one-size-fits-all' approach to treatment has been inefficient or ineffective for many individuals. A major challenge in analyzing human clinical samples is distinguishing driver from passenger mutations, leading to an incomplete understanding of the pathway dependency of specific driver mutations. To address this, we established a mouse organoid platform using HCC tissue with defined driver mutations (loss of TP53, Axin1, PTEN, Mcl1 overexpression or CTNNB1 activating mutations delivered via hydrodynamic tail vein injection, along with MYC and sleeping beauty transposase) to study the characteristics of driver-specific HCC and their response to therapy. We screened over 700 drugs and identified inhibitors targeting HMGCR and ERBB to be able to preferentially inhibit the growth and induce cell death of HCC carrying CTNNB1 mutations, one of the commonest alterations detected in human HCC cases. These reflections were observed both in vitro and in vivo and primary human HCC patient-derived organoids. Our study not only reports on the development and characterization of mouse HCC models and their corresponding organoids but also utilizes the platform to evaluate drug response heterogeneity. This scalable platform offers insights into the characteristics of cancer arising from specific driver mutations and has the potential to incorporate other functional aspects including microenvironmental interactions.



Professor Clive Yik-Sham CHUNG

Assistant Professor,
School of Biomedical Sciences, HKU

Chemoproteomics-driven identification of new druggable hotspots in cancers and discovery of anticancer covalent ligands

Chemoproteomics is an advanced proteomics technology using chemical probes to study functions and activities of proteins. As many functional proteins are associated with disease development and progression, the applications of chemoproteomics have been extended to drug target identification and covalent drug development for EGFR, BTK and KRAS G12C covalent inhibitors. In this talk, I will first discuss the unique features of our chemoproteomic probe, NAIA, which can significantly advance the chemoproteomics platform by expanding the pool of targetable hotspots, even on proteins which were once considered as undruggable. Then, I will showcase how anticancer covalent ligands targeting these new hotspots can be developed from chemoproteomics-coupled screening experiments. Through covalent binding with Rac1 Cys178, CL1 disrupts Rac1-GEF interactions, thus inhibiting Rac1 activity in hepatocellular carcinoma (HCC) cells. This leads to downregulation of pRb, cyclin D1 and E2F1, and hence G1-phase cell cycle arrest in the HCC cells. The versatile chemoproteomics platform also enables the discovery of CL26 to target AGPAT4, which is a functional regulator of cancer cell plasticity in HCC. The covalent binding of CL26 onto Cys228 of AGPAT4 induces steric hindrance on substrate binding to the active site, thus resulting in strong inhibitory effects on AGPAT4. This allows CL26 to demonstrate promising anticancer effects through overcoming sorafenib-resistance in HCC cells and patient-derived tumor xenograft models. All these results should highlight the powerful application of our chemoproteomics platform in liver cancer research and drug development.



Professor Judy Wai-Ping YAM

Professor,
Department of Pathology,
School of Clinical Medicine, HKU

Unraveling the uptake mechanisms of small extracellular vesicles and their significance in hepatocellular carcinoma

Small extracellular vesicles (sEVs) play a critical role in intercellular communication by facilitating the transfer of bioactive molecules between different cell types. These membrane-bound particles are secreted by various cells and have the ability to modulate cellular phenotype and signaling pathways upon uptake by recipient cells. In our recent research, we focused on elucidating the intricate interplay between sEVs and hepatocellular carcinoma (HCC). Our study unraveled the mechanisms through which sEVs contribute to the progression of HCC, particularly in promoting tumor growth, angiogenesis, and metastasis, which are crucial processes in cancer development. The entry pathway of sEV is of vital importance in determining the effect of EVs in the recipient cells. However, how sEV enters HCC cells remains obscure. This study aims to elucidate the mechanistic basis underlying the internalization of sEV by HCC cells. We identified macropinocytosis as the primary uptake mechanism of sEVs by HCC cells. Macropinocytosis refers to the process by which cells engulf extracellular fluid and particles. Mechanistically, we delineate how a high level of NHE7, a sodium-hydrogen exchanger, regulates intracellular and endosomal pH, leading to the maturation of macropinosomes. Inducible inhibition of NHE7 in established tumors delays tumor development and suppresses metastasis. Clinically, NHE7 is upregulated and associated with poor prognosis of HCC. Here, we provide evidence that macropinocytosis controls the internalization of sEV and their effect on the recipient cells. In addition, this study provides insights into the blockade of sEV uptake as a therapeutic strategy for HCC.

Clinical Research Presentations



Dr James Yan-Yue FUNG

Consultant
Department of Medicine,
Queen Mary Hospital and
Honorary Clinical Associate Professor
Department of Medicine,
School of Clinical Medicine, HKU



Professor Jack Chun-Ming WONG

Professor
Department of Pathology,
School of Clinical Medicine, HKU

Speakers



Professor Walter Wai-Kay SETO

Clinical Professor
Department of Medicine,
School of Clinical Medicine, HKU

The gut microbiome and liver disease: A genuine link?

The gut microbiome has been linked to many aspects of human health, including the liver. This talk will review the latest findings on the gut-liver axis, including the role of the microbiome in liver metabolism, inflammation, and in various chronic liver diseases, including viral hepatitis, metabolic associated fatty liver disease, liver cirrhosis and liver cancer. We will also discuss emerging strategies for manipulating the gut microbiome to promote liver health, such as probiotics, and fecal microbiota transplantation. The presentation aims to provide a comprehensive overview of this burgeoning field, emphasizing the importance of understanding the gut microbiome's impact on liver health and disease management.

Clinical Research Presentations



Professor Walter Wai-Kay SETO

Clinical Professor
Department of Medicine,
School of Clinical Medicine, HKU



Dr Regina Cheuk-Lam LO

Clinical Associate Professor
Department of Pathology,
School of Clinical Medicine, HKU

Speakers



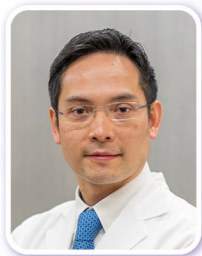
Professor Thomas Chung-Cheung YAU

Clinical Associate Professor,
Centre of Cancer Medicine,
Department of Medicine,
School of Clinical Medicine, HKU

Anti CTLA 4 in advanced hepatocellular carcinoma

The systemic treatment of unresectable hepatocellular carcinoma (uHCC) has undergone an evolution in recent few years. The immune checkpoints Programmed cell death protein 1 pathway (PD-1), programmed death ligand 1 (PDL-1)) and the cytotoxic T-lymphocyte-associated protein 4 (CTLA-4) pathway are heavily implicated in tumour immune escape. The blockade of these two pathways by immune checkpoint inhibitors has considerably improved the outcomes in uHCC patients. In March 2020, the combination nivolumab and ipilimumab(N+I) was approved by the US FDA for treatment of uHCC patients who received prior sorafenib. This was based on the results of the phase I/II CheckMate- 040 cohort 4 trial, which showed a good overall response rate and encouraging overall survival (OS) with a manageable safety profile. Furthermore, in the first line setting, the Phase 3 HIMALAYA study, which investigated the use of durvalumab (D) with tremelimumab(T) in uHCC demonstrated that a single priming dose of T plus regular interval D significantly improved OS vs sorafenib. This combination was also approved by the US FDA as the first line treatment of uHCC patients in 2022. More recently, in Phase III trial Checkmate 9DW trial, the trial results showed promising response rate and long-term OS in using the N+I combination as the first line treatment of uHCC patients.

Named Lecture by AstraZeneca



Professor Albert Chi-Yan CHAN

Clinical Professor,
Department of Surgery,
School of Clinical Medicine, HKU

**Combining immunotherapy in surgical oncology:
Current research and future perspectives**

TBC



REACH BEYOND



IMFINZI in combination with **IMJUDO**
is indicated for the first-line treatment of
adult patients with **unresectable hepatocellular
carcinoma (uHCC)**.^{1,2}



IMFINZI in combination with **IMJUDO** and platinum-based chemotherapy for the treatment of adult patients with **metastatic non-small cell lung cancer (NSCLC)** with no sensitizing epidermal growth factor receptor (EGFR) mutation or anaplastic lymphoma kinase (ALK) genomic tumor aberrations.^{1,2}



IMFINZI in combination with **gemcitabine and cisplatin** is indicated for the first-line treatment of adult patients with **locally advanced** or **metastatic biliary tract cancer** (BTC).¹



References: 1. IMFINZI Hong Kong Product Insert Feb. 2024. 2. IMJUDO Hong Kong Product Insert Dec. 2023.

[illegible][illegible]

Please visit contactazmedical.astrazeneca.com, for (1) enquiring Medical Information (MI), (2) reporting Individual Case Safety Report (ICSR) and/or (3) reporting Product Quality Complaint (PQC) to AstraZeneca Hong Kong Limited. **IMJUDO**®, **IMFUSI**® and **英華**® are registered trademarks of AstraZeneca group of Companies. ©2024 AstraZeneca. All rights reserved. Code