Domain 10: Gastroenterology, Hepatology and Microbioresearch

Miniprogramme on *Clinical and Translational Advances in Gastroenterology*

Aims and General information

This **miniprogramme** combines a webinar series and a workshop. The *Webinar series* (7 webinars) aims to provide a wider view of current gastroenterology research subjects than can be provided at any single university by local experts and to encourage students to exchange with researchers and international experts from CIVIS universities. The *Workshop* will describe the main methodology used in microbiome research (i.e. sample collection, sample storage and processing, and sequencing) and provide some ideas for IBD translational microbiome studies. It will present the technologies and computational tools used to characterize and study the microbiome. The Miniprogramme will offer an excellent opportunity for students to consider lab placements and clerkship, further studies or collaborations within the CIVIS Alliance.

This webinar series is a teaching offer of the CIVIS partners:
SUR, NKUA, UAM, UB, ULB

Learning outcomes
- Knowledge of current areas of research in the Health Domain Gastroenterology, Hepatology and Microbioresearch
- Contact and exchange opportunities with academics/researchers from CIVIS universities
- Contact opportunity with students from CIVIS universities

General information
- The Miniprogramme will be delivered in the period **14th April 2022 - 26th May 2022** (webinars every Thursday at 4:00-6:00 pm CET, except the workshop which will be on Wednesday 4th May at 4:00-6:00 pm CET).
- Each webinar will be of 2 academic hours;
- The work will be of 2.5 academic hours
- Primary target audience: master students of Medicine and Surgery (4th -6th year), Biotechnologies, Medical Biology, Microbiology courses and PhD students of courses in the relevant areas. The webinars will be indeed tailored for this target audience
- The mini-programme provides 2 ECTS* and will also be made available synchronously on the appropriate platform, when it will be made available by the CIVIS Alliance (i.e. CIVIS Digital Campus).

*recognition of the 2 ECTS credits will be only for the students attending the entire miniprogramme online.

Full description of the content of the webinars of the series and dates

1) April 14, 2022

Dysbiosis in Inflammatory Bowel Disease: Role of the microbiota in the pathophysiology of the disease

(Presenters: Laila Aldars and Claire Liefferinckx; Chairs: Javier Gisbert and Daniela De Biase)

The microbiota is the wide variety of microorganisms that live in a certain environment: so the "gut microbiota" includes all archaea, bacteria, viruses, and fungi living in the gut. The importance of the gut microbiota in human health is now well established. It contributes to many vital functions such as development of the host immune system, digestion and metabolism, barrier against pathogens or brain–gut communication. Changes in microbial abundances in the gut have been

associated with Inflammatory Bowel Disease (IBD). Microbes that are commonly found in high abundance in healthy gut microbiomes, such as *F. prausnitzii* or *R. hominis*, are reduced in the IBD patients. *E. coli*, which is usually present in a healthy gut in very low concentrations, is increased in the IBD patients' gut. In this session we will describe the changes in the IBD gut microbiota and give some hints about its implication in IBD pathophysiology.

2) April 21, 2022

Immune system, microbiota and Inflammatory Bowel Disease

(Presenters: Laila Aldars and Claire Liefferinckx; Chairs: Javier Gisbert and Vincenzo Cardinale)

The microbiota is the wide variety of microorganisms that live in a certain environment: so, the "gut microbiota" includes all archaea, bacteria, viruses, and fungi living in the gut. Correct interplay between gut microbiota and the host is essential for human health
and, more specifically, for the development of an appropriate immune system. Microbial balance is pivotal for host metabolic and immune functions as well as to prevent disease development. Disturbance in that balance generates dysbiosis making the host susceptible to certain diseases, including Inflammatory Bowel Disease (IBD). The complex interplay between the microbiota, the intestinal mucosa, and the immune system highlights the importance of a holistic approach when unravelling the mechanisms underlying intestinal dysbiosis. In this webinar we will focus on how microbiota and immune system are developed during life in order to establish immunological tolerance, and present IBD as a paradigm on of how defects in this process can lead to disease.

3) April 28, 2022

Gut-Liver and Gut-Brain axis: modulation of gut microbiota

(Presenters: Vincenzo Cardinale and Daniela De Biase; Chair: Gratiela Gradisteanu)

Despite its containment to surfaces, it is now appreciated that the gut microbiota influences the development and function of all systems of the mammalian body, having both local and systemic effects. Resident microbes can produce molecules that directly impact the development and function of cells within various tissues, contribute energetic-structural and immunitary homeostasis of the intestinal barrier. Enterohepatic circulation represents a vital function of the gut-liver axis. Disbiosis is associated with ineffective nutrient absorption and a failure to prevent the translocation of luminal bacteria and their products. Gut permeability and bacterial translocation are key pathogenic moment of several diseases, e.g. NAFLD, liver cirrhosis, and in the so called non communicable preventable chronic diseases. The webinar will deal with the basic knowledge concerning the multidisciplinary background acquired into this topic and will provide recent advances directly connected with modulation of gut-liver axis and microbiota for therapeutic purpose (Vincenzo Cardinale). Moreover, we (Daniela De Biase) will focus on recently identified metabolites of microbial origin and bacterial components, which have many different effects on host signalling processes. These effects will be discussed in light of their contribution to health vs. disease state.

4) May 5, 2022

Cell therapy and stem cells: updates and perspectives

(Presenters: Vincenzo Cardinale and Héctor Guadalajara; Chair; Lorenzo Ridola)

Cell products are the cornerstones of regenerative medicine applications into inflammatory bowel diseases (i.e. fistulizing Crohn Disease) and advanced liver diseases (i.e. end stage liver disesase). Cell therapy refers to the use of living cells into the patient's body implanted in the operation rooms (OR). One of the main modalities is the use of Stem Cells (SCs) - a cell with the unique ability to develop into other specialised cell types in the body, which can serve as a therapy (i.e., cytotherapy) with a medicinal effect. This is the base of regenerative medicine: to restore damaged tissue

(restitutio ad integrum) with its architecture and function (e.g., tissue engineering). At present, the efforts are mainly addressed in developing SCs, while advancing in its basic research and therapeutic strategies. In this webinar, we provide an update of these advancements reviewing key concepts such as the biology of SCs and bioengineering, highlighting the main clinic developments with SCs in the field of General Surgery and Digestive System (Héctor Guadalajara). The webinar will also deal with two of the most relevant implications of the cell therapy: 1) the treatment of complex perianal fistulas in Crohn's disease, and 2) the treatment of liver cirrhosis (Vincenzo Cardinale).

5) May 12, 2022

Decision making in Abdominal Surgery

(Presenters: Olatz Lopez Fernandez and Héctor Guadalajara; Chair: Lorenzo Ridola)

Shared decision-making (SDM) is related to new ways of approaching patient-centred healthcare when a diagnosis is usually severe, such as colorectal cancer (CRC), and there is more than one option treatment. It requires physicians and patients to co-work to make quick and joint decisions about the tests and treatments to get through the healing process to guarantee wellness, preserving bioethics principles. This process supports many agents involved: physicians, patients (and families), other clinicians, or new professionals in the healthcare system. At present SDM needs from adapted and tested set of models and aids during, between, and after these encounters which can also involve other health actors and support a humanistic approach of care. In this webinar we will focus on how SDM can be applied in CRC when deciding about surgery options using new technological patients' aids to establish a quality join decision and present a SDM paradigm to cover existing gaps in this process to improve patients' quality of life.

6) May 19, 2022

Alcohol-related liver disease and advanced cirrhosis: advances in clinical and translational research

(Presenters: Eric Trepo, Stratigoula Sakellariou, Pierre Deltenre and Thierry Gustot, Chairs: Dina Tiniakos and Christophe Moreno)

Alcohol-related liver disease (ALD) is one of the most prevalent types of liver disease worldwide. According to the latest World Health Organisation (WHO) estimates, alcoholic beverage consumption globally resulted in 3 million alcohol-attributable deaths (5.3 % of all deaths worldwide in 2016). ALD comprises a range of disorders including steatosis which can lead to steatohepatitis, fibrosis, cirrhosis, and in some cases to hepatocellular carcinoma. Severe alcohol-related steatohepatitis can lead to alcoholic hepatitis (AH), an acute clinical syndrome characterized by recent onset of jaundice and associated with poor prognosis. In this webinar, we will review the natural history of ALD, including genetic susceptibility to develop the disease, provide an update on ALD pathology, discuss the management of severe AH and ALD patients developing acute-on-chronic liver failure.

The webinar will develop as follows: 1) Natural history of alcohol-related liver disease, (Eric Trepo); 2) Update on alcohol-related liver disease pathology (Stratigoula Sakellariou) 3) Management of severe alcoholic hepatitis, (Pierre Deltenre) 4) Acute on chronic liver failure and alcohol-related liver disease (Thierry Gustot).

7) May 26, 2022

Chronic intestinal failure: clinical and translational research

(Presenters: Marianna Arvanitaki and Alia Hadefi; Chair: Lorenzo Ridola)

Chronic intestinal failure is the rarest organ failure, but its prevalence across Europe is increasing. Patients have complex diseases and requirements, and optimal care involves multiple specialties

and disciplines. Home parenteral nutrition — the first-line treatment for chronic intestinal failure — is a life-saving therapy.
In this webinar, we will focus on all aspects of chronic intestinal failure including aetiology, classification, complications and management with parenteral nutrition. Lastly, a discussion regarding research opportunities in this field will also be part of this webinar.

Full description of the workshop

May 4, 2022

1) ***Methodological aspects in the study of the microbiota and Inflammatory Bowel Disease***
(Presenters: Laila Aldars Garcia and Sebastian Mas-Fontao)
Gut microbiome analysis is used to understand many diseases, and preparation, handling, and storage of samples are critical processes that alter the outcomes of downstream DNA-based microbial community analyses. The widespread application of high-throughput genomic approaches has revolutionized the study of complex microbial communities and allowed for the development of sequencing-based approaches. Each methodological stage, from sampling to sequencing, can introduce biases.
Studies in animal models and humans have shown that there is a persistent imbalance in the intestinal microbiome related to IBD, with a substantial body of literature providing evidence for the role of human gut microbiome on IBD. In general, these studies have a number of limitations, such as the small sample size, the lack of a valid gold standard (such as endoscopic evaluation) to classify the presence of disease activity, most of them do not take into account previous and current treatments (which can modify the biological state), lack of information about the accuracy of the biomarkers, lack of longitudinal studies, and they find heterogeneous results which have not been validated in independent cohorts. In this session we will describe the main methodology used in microbiome research including sample collection, sample storage and processing, and sequencing, and provide some ideas for IBD translational microbiome studies.

2) ***Data analysis and statistical approach in microbiota research***
(Presenter: Gratiela Gradisteanu)
Over the past decade, it has become very clear that the microbiome is an essential player in human health and disease and thus should be analysed to develop innovative treatment strategies. To this end, the field of metagenomics has come a long way in leveraging the advances of next-generation sequencing technologies resulting in the capacity to identify and quantify almost all microorganisms present in human specimens. Nevertheless, the field of metagenomics is still in its infancy, specifically in terms of the limitations in standardization, statistical assessments, computational analysis, and validation due to vast variability in bioinformatic workflows and the experimental design. Our workshop will present the technologies and computational tools used to characterize and study the microbiome. We expect our students to get a flavor of the steps need to analyze the microbiome as this is an exciting field of research.

Biosketches of the presenters and chairs (listed in alphabetical order):

Laila Aldars-Garcia (HULP-**UAM)** – Postdoctoral Researcher. She has a degree in Nutrition, Food Science and Technology from the Universidad Autonoma de Madrid (Spain) and she continued her training in health sciences by taking the Official Master's Degree in Pharmaceutical

Sciences at the Universidad Complutense de Madrid (Spain). She completed her doctoral thesis at the University of Lleida (Spain) where she focused on microbiology, as well as on the design of predictive models. During her PhD she had the opportunity to work at Cranfield University (UK). During her research career she has specialised in microbiology and in recent years she has focused on the study of gut microbiota. Since 2020, Dr. Laila Aldars-García has been working in Dr. Javier P. Gisbert's group at the Hospital de La Princesa in Madrid investigating the microbiome and metabolome of patients with Inflammatory Bowel Disease using metagenomic and metabolomic approaches.

Marianna Arvanitaki (**ULB**). Marianna Arvanitakis finished her medical degree in 1997 in Brussels, Université Libre de Bruxelles, and pursued her fellowship in Internal Medicine/Gastroenterology. She has been working in the Erasme University Hospital since 2002, where she has a position of Full Professor since 2018. She is head of the Clinic of Pancreatology and Clinical Nutrition. She presented a PhD thesis focused on diagnosis and treatment of pancreatic diseases in 2007. Her main clinical and research interest are pancreatic diseases, clinical nutrition, and therapeutic endoscopy. She has an active role in the European Society of Gastrointestinal Endoscopy (ESGE) Governing Board as the individual member representative since 2014 and as the chair of the Education Committee since 2018. She has been part of numerous ESGE guidelines and is in the Editorial Board of the journal Endoscopy. She is also member of in the UEG scientific committee since 2014 and chair of the postgraduate teaching (PGT) course. She is also an active member of the European Society of Enteral and Parenteral Nutrition (ESPEN), of the American Gastroenterology Association (AGA) and the American Society of Gastrointestinal Endoscopy (ASGE).

Vincenzo Cardinale (SUR) – Vincenzo Cardinale ia Associate Professor of Gastroenterology at Sapienza University of Rome. In 2005 he graduated in Medicine and Surgery at Sapienza University of Rome, under the mentorship of Prof. Domenico Alvaro, who continues to mentor him. He discovered stem/progenitor cell niches in biliary tree and studied their role in regeneration, liver diseases, diabetes, and malignancies. Following his investigations biliary research has been revisited. His pioneering studies have been recognized and confirmed in multidisciplinary settings delivering advances in primary sclerosing cholangitis, cholangiocarcinoma, non-anastomotic biliary strictures, and biliary diseases with pancreatic counterparts. His investigations on niches of stem/progenitor cells in biliary tree, pancreas and duodenum open ground-breaking perspectives in regenerative medicine. Dr. Cardinale is currently coordinating a pan-European network to fight cholangiocarcinoma (COST Action CA18122).

Daniela De Biase (SUR) – Associate Professor (Hab. Full Professor). She teaches Biochemistry to students of the Health area: Medicine (including International Medical School, fully tought in English) and Midwifery. She is Erasmus Coordinator of the Faculty of Pharmacy and Medicine (medical area), and member of CIVIS Health Hub Council and CIVIS WP6 (Task Force Mobility). She is in the teachers' board of the PhD course in Life Sciences. Her scientific interests are at the crossroad between microbiology, biochemistry and biotechnology. She is expert on microbial responses to acid stress relying on glutamate/glutamine and leading to GABA production/release. She is moving her research interest also to the study of the human microbiota. Vice-chair of a COST Action CA18113 (https://www.cost.eu/actions/CA18113; 2019-2023) and Sapienza Coordinator for the recently funded Erasmus Project DOMINOS (for online OSCE). Associate Editor for Frontiers in Microbiology, Microbial Physiology and Metabolism Section.

Pierre Deltenre (**ULB**) – Pierre Deltenre is Specialist in Hepatology. He completed his medical training in the University of Louvain in Belgium in 1997. He undertook a research fellowship in Professor Valla's unit at Beaujon Hospital in Clichy in France between 1996 and 1997. Between 1999 and 2013, he was consultant in CHRU of Lille, France in the team of Professor Mathurin. He achieved his Ph.D. in Erasme Hospital (Free University of Brussels, Belgium) in 2012. He worked in Lausanne University Hospital between 2013 and 2017 where he became Assistant Professor. He is now working in the unit of Hepato-Gastroenterology in Clinique Saint-Luc, Namur, and as a consultant in the Department of Hepatology and Gastroenterology of Erasme University Hospital, Brussels, Belgium. Pierre Deltenre is "Maître de Conférence" at Free University of Brussels, Belgium. He has published more than 120 articles in prominent journals including Gastroenterology, Hepatology, Gut and Journal of Hepatology. His main research interests are complications of cirrhosis and Hepatitis C virus infection.

Olatz Lopez-Fernandez (FJD-**UAM)** – She is a health psychologist researcher in the University Hospital Fundación Jiménez Díaz, a teaching hospital associated with the "Universidad Autonoma de Madrid" (Spain). Her expertise is as a clinical psychology and applied research developing and managing projects to promote the detection, follow up, and prevention of traditional and emerging health diseases through innovate technologies and methods. She places her work on the educational and healthcare arena from a psychological and humanistic perspective, such as addictions or oncologic problems. She has led projects within the European Commission and the European Parliament, and collaborates with many other local and national projects in Spain.

Javeir P. Gisbert (HULP-**UAM**) – Specialist in Gastroenterology (Senior Consultant), Chief of Section and Director of the Inflammatory Bowel Disease Unit at La Princesa University Hospital, Madrid, Spain. Past-President of the Spanish Inflammatory Bowel Disease Group (GETECCU). Spanish representative/past-President of the European Helicobacter and Microbiota Study Group. Doctor (PhD), Magister in Methodology in Clinical Investigation, and Tenure Professor. Speaker at >200 conferences.>1,000 articles published in journals. Coordinator/Principal Investigator in >250 Research Projects. Member of 15 Medical Societies. Expert reviewer for 28 Scientific Organizations. International Editor of the Cochrane Collaboration. Reviewer for >300 scientific journals. Member of the Editorial Board of >15 journals.

Gratiela (Pircalabioru) Gradisteanu (**UB**) – Senior Researcher at the Research Intitute of University of Bucharest (ICUB), she teaches Medical Microbiology (6 ECTS) and New targets for developing antimicrobial agents (5 ECTS) to Master Students at the Faculty of Biology. She is member of the CIVIS Health Hub Council. Her research interests include microbiome changes in diabetes and metabolic syndrome, in vivo and ex-vivo investigation of host-pathogen crosstalk during the infectious process, oxidative stress in health and disease, assessment of the antimicrobial activity of novel antimicrobial compounds, SARS-CoV-2 diagnostic and omic technologies. She coordinates the microbiome analysis platform at ICUB.

Héctor Guadalajara (FJD-UAM) – He is chairman of Surgery at University Hospital Fundación Jimenez Díaz and Associate Professor at "Universidad Autonoma de Madrid" since 2014. He is mainly a Colorectal Surgeon participating in 250 procedures per year, with a special dedication to robotic colorectal surgery and proctology. Product of this medical activity he is one of the world pioneers of the stem cell therapy for fistula in Crohn disease, and provide his expertise to Takeda Company worldwide. Another very important aspect of his career is the University teaching and innovation in education. He is one of the main promoters of "Operemos.es". "Operemos.es" is a contact network that facilitates education to students and people willing to learn technical

manoeuvres. As chairman of Surgery, he has been involved in the automatization of the surgical worklist at Quirónsalud, project that has significantly increased the surgical yields in the Operation Room. And finally, he has been committed with the health care humanization implementing sharing decision tools.

Thierry Gustot (**ULB**) – Thierry Gustot is professor and clinical director of the Liver Transplant Unit at CUB Hôpital Erasme, Brussels, Belgium. He is senior researcher at the Laboratory of Experimental Gastroenterology at Université Libre de Bruxelles and at the Inserm U1149, Centre de Recherche sur l'Inflammation, Paris, France. He is Vice Chairman of the governing board of the EASL-Clif Consortium. He contributed to multiple international collaborative projects (CHANCE, NCT04613921; DECISION H2020, 847949). He is author and co-author of more than 100 peer-review publications in high-ranked journals (Journal of Hepatology, Gastroenterology, Hepatology, New Engl J Med). He is co-Editor of JHEP Reports and member of the editorial board of Journal of Hepatology and Liver Transplantation.

Alia Hadefi (**ULB**)- Alia Hadefi obtained her medical degree in 2012 at Université libre de Bruxelles (ULB, Belgium) and was board-certified gastroenterologist in 2018. She started a PhD in the field of translational research regarding endoscopic bariatric and metabolic therapy (EBMTs) and NAFLD. She is currently working as Fonds Erasme fellow researcher at IRIBHM lab and the laboratory of experimental gastro-enterology (ULB). Her main research topics are about EBMTs, NAFLD and nutrition. She is currently working in the department of gastroenterology at Erasme hospital. She is member of Young Talent Group and Young Talent Pool of UEG.

Claire Liefferinckx (**ULB**) – Claire Liefferinckx obtained her medical degree in 2014 at Université libre de Bruxelles (ULB, Belgium). She worked as a FNRS fellow researcher at the laboratory of experimental gastro-enterology (ULB) and obtained her PhD thesis in 2019. Her main research topics are about the pharmacokinetics of biologics used in Inflammatory bowel diseases (IBD), the genetics underlying the severity in IBD and the involvement of microbiota in these diseases. She obtained a FNRS post-doctoral fellowship (2019-2022) to investigate the involvement of microbiota in the severity of IBD. In parallel, she works in the department of gastroenterology at Erasme hospital. She is member of Scicom in the BIRD.

Sebastián Mas Fontao (FJD-**UAM)** – Principal investigator and group leader of the renal pathology and diabetes laboratory. Degree and PhD in Biochemistry and Molecular Biology (UCM). His field of research focuses on diagnostic, prognostic and therapeutic biomarkers of diabetes complications using -omics approaches (including microbiome analysis) in clinical trials and preclinical models.

Christophe Moreno (**ULB**) – Christophe Moreno is Professor and Clinical Director of the Liver Unit in the Department of Gastroenterology, Hepatopancreatology and Digestive Oncology in CUB Hôpital Erasme since 2012. He is senior researcher at the Laboratory of Experimental Gastroenterology at Université Libre de Bruxelles. He completed his medical training in the Faculty of Medicine of the Université Libre de Bruxelles and achieved his PhD in the Laboratory of Experimental Gastroenterology (Université Libre de Bruxelles) in 2007. He was president of the Belgian Association for the study of the Liver (2017-2018), member of European Association for the Study of the Liver and the American Association for the Study of Liver disease. He was Associate Editor for Journal of Hepatology (2014-2019) and is Associate Editor for UEG Journal since 2019. Christophe Moreno has published more than 120 articles in prominent journals including the New England Journal of Medicine, JAMA, Gastroenterology, Hepatology and Journal

of Hepatology. His main research interests are alcohol-related liver diseases, complications of cirrhosis, and genetics of liver disease.

Lorenzo Ridola (SUR) – Lorenzo Ridola is Associate Professor in gastroenterology at the "Sapienza" University of Rome, Rome (Italy).He received his medical education at the "Sapienza" University of Rome and graduated in Medicine and Surgery in 2005. In 2009, he specialized in Gastroenterology, at the "Sapienza" University of Rome and in 2013, he obtained a Ph.D. in "Clinical and Experimental Hepatology" in the same University. From 2010 Dr. Ridola serves as clinical and research gastroenterologist at Polo Pontino Health hub, "Sapienza" University of Rome. Dr Ridola's scientific interests include the complications of liver cirrhosis and particularly portal hypertension and hepatic encephalopathy. Lorenzo Ridola is a member of: Italian Society of Gastroenterology (S.I.G.E.), Italian Association for the Study of the Liver (A.I.S.F.).

Stratigoula Sakellariou (NKUA) – Dr. Stratigoula Sakellariou is a Histopathologist and Assistant Professor in the 1st Dept. of Pathology, Medical School of National and Kapodistian University of Athens (NKUA). She has a special interest in liver, pancreas and GI tract Pathology. She was a visiting Pathologist at the Institute of Liver Studies, King's College Hospital, London, UK under the direction of Prof Bernard Portmann. Currently, she is a member of the Liver Transplantation Program of Laiko General Hospital in Athens. Her research is mainly focused on liver diseases. Additionally, she is involved in the study of inflammatory bowel diseases, GI and pancreatic cancer.

Dina Tiniakos (NKUA) - Dina Tiniakos is Professor of Pathology and Director, Dept of Pathology, Aretaieion Hospital, National & Kapodistrian University of Athens, Greece, and an academic liver pathologist at the Translational and Clinical Research Institute, Faculty of Medical Sciences, Newcastle University, UK. She is Past President of the European Society of Pathology and Chair, Equality & Diversity Taskforce, United European Gastroenterology. She is an invited member of the International Liver Pathology Group "Gnomes" and the Laennec Liver Pathology Society. Her main research interests are fatty and autoimmune liver disease and hepatocarcinogenesis. She has authored >170 peer-reviewed scientific articles and textbooks chapters on liver pathology. She is Associate Editor of "Histopathology" and Editorial Board member of "Journal of Hepatology" and "Annals of Gastroenterology".

Eric Trépo (**ULB**) – Dr. Trépo is a Hepatologist and Associate Professor at CUB Hopital Erasme, Université Libre de Bruxelles (ULB), Brussels, Belgium. He is also a Research Associate from the Fund for Scientific Research-FNRS and a steering committee member of the Belgian Association for the Study of the Liver. His research focuses on the susceptibility to alcohol-related liver disease (ALD) especially severe alcoholic hepatitis and hepatocellular carcinoma (HCC). His group aims to further improve our understanding of ALD using genome-wide association studies, and single cell genomics.