

## **EASL School: Advanced Immunology of the Liver; Deep Immunophenotyping of liver FNA and resection samples using multi-modal techniques**

**27- 28 June 2025, Oxford, UK**

### **EASL School summary:**

This interactive course will be held at the historic and internationally renowned University of Oxford, UK, within the Nuffield Department of Medicine – the largest department in biomedicine in Europe (<https://www.ndm.ox.ac.uk/>). NDM is particularly known for its international reach in advanced immunology, hosting the NIHR Biomedical research Institute with a focus on vaccine development, the Jenner Institute that was instrumental in developing the COVID19 ChAdOx1 vaccine that saved millions of lives globally, The Peter Medawar Building for Pathogen Research developing vaccines against HBV and HCV, and the Translational Gastroenterology and Hepatology Unit, that sits on hospital premises, allowing direct access to clinical samples with a focus on the immune analysis of the liver in patients with liver cancer, viral hepatitis and autoimmune liver disease.

An interactive course, introducing students to advanced immunological techniques as applied to translational hepatology research. Students will participate in sessions that cover (i) experimental design of experiments that seek to use advanced immune techniques in liver research, (ii) data analysis of complex transcriptomic and cellular immune data sets, alongside hands-on wet-lab experience in both traditional and cutting-edge immunological techniques including interferon- gamma, ELISpot, multiparameter flow cytometry and single cell RNA sequencing. We will address ways to access and process liver samples for immune analysis, and strategies for comparative analysis in blood and liver.

### **Course organisers:**

Professor Eleanor Barnes (BSc. MBBS, PhD, F Med Sci): Professor of Hepatology and Experimental medicine, University of Oxford.

Professor Paul Klenerman, (BA Cam. BMBCh, PhD, F Med Sci): Sidney Truelove Professor of Gastroenterology, University of Oxford.

Dr Emma Culver, (BSc. MBChB, PhD): Consultant Hepatologist and Senior Lecturer in Gastroenterology and Hepatology, University of Oxford.

Dr Tamsin Cargill, (BSc. MBBS, PGDip, PhD): Academic Clinical Lecturer and Honorary Specialist Registrar in Gastroenterology and Hepatology, University of Oxford.

Dr Tom Marjot, (BSc. MBBS): Wellcome Trust Clinical Research Training Fellow and Honorary Specialist Registrar in Gastroenterology and Hepatology, University of Oxford.

Dr Rory Peters (MBBCh): Cancer Research UK Clinical Research Fellow and Specialist Registrar in Gastroenterology and Hepatology, University of Oxford.

Dr Anthony George, Clinical Research Fellow and Honorary Specialist Registrar in Gastroenterology and Hepatology, University of Oxford.

### **Faculty list with institution:**

Professor Eleanor Barnes – University of Oxford  
Professor Paul Klenerman – University of Oxford  
Dr Emma Culver – University of Oxford  
Dr Lucy Garner – University of Oxford  
Dr Helen Ferry – University of Oxford  
Dr Tamsin Cargill – University of Oxford  
Dr Tom Marjot – University of Oxford  
Dr Sam Murray – University of Oxford  
Dr Anthony George – University of Oxford  
Dr Rory Peters – University of Oxford  
Dr Leo Swadling – University College London  
Dr Uppy Gill – Queen Mary University of London

### **Pre course material**

The event will be held within the historic and internationally acclaimed University of Oxford in the state-of-the-art laboratories and offices hosted by the course organisers. The course will span two days and will consist of a series of sessions in small groups that cover experimental design and analysis, with a state-of-the-art lecture by EASL fellow Dr Uppy Gill (internationally recognised for his work assessing intrahepatic immune cells using fine needle aspiration [FNA] in HBV). The flipped classroom model will be employed with students learning in advance through participating in an online series of 20–30-minute webinars recorded by the faculty, outlining the following methodologies and their applications. This will free time for experimental design and data analysis at the school. The webinars will cover the following topics:

- Accessing the liver immunological niche: liver tissue sampling techniques
- ELISpot
- Multi-parameter flow cytometry including intra-cellular staining.
- Single cell RNA sequencing and related technologies
- Integrative analysis

DAY 1		
08:45 – 09:00	<p><b>Registration</b> Welcome to the School and overview of the programme.</p>	<p>Prof Ellie Barnes Prof Paul Klenerman Dr Emma Culver</p>
09:00 - 10:00	<p><b>Session 1: Deep immunophenotyping of liver tissue and blood – Experimental approaches</b></p> <p>Break-out groups of 5 students design a study to answer the research question:</p> <p>“What are the immunological correlates that predict treatment response to checkpoint inhibitor/VEGF combination therapy in HCC?”</p> <p>Group 1&amp;2: Techniques to access liver tissue.</p> <p>Group 3&amp;4: Techniques to evaluate the transcriptome.</p> <p>Group 5: Techniques to evaluate immune responses (innate and adaptive)</p>	<p>Dr Tamsin Cargill Dr Rory Peters Dr Anthony George Dr Helen Ferry Dr Leo Swadling Dr Lucy Garner</p>
10:00 - 10:30	Coffee break	
11:00 - 13:00	<p><b>Session 2: Hands-on-session 1</b> (rotate in groups of 5)</p> <p>Group 1&amp;2: Processing liver tissue obtained at FNA, biopsy and resection for immunological techniques</p> <p>Group 3&amp;4: ICS and Multiparameter flow cytometry</p> <p>Group 5: scRNAseq library prep</p>	<p>Dr Tamsin Cargill Dr Rory Peters Dr Helen Ferry Dr Leo Swadling Dr Sam Murray Dr Lucy Garner</p>
13:00 - 14:00	Lunch	
14:00 - 16:00	<p><b>Session 3: Hands-on-session 2.</b> (rotate in groups of 5)</p>	<p>Dr Tamsin Cargill Dr Rory Peters Dr Helen Ferry Dr Leo Swadling</p>

	<p>Group 5: Processing liver tissue obtained at FNA, biopsy and resection for immunological techniques</p> <p>Group 1&amp;2: ICS and Multiparameter flow cytometry</p> <p>Group 3&amp;4: scRNAseq library prep</p>	<p>Dr Sam Murray Dr Lucy Garner</p>
16:00 - 16:30	Coffee break	
16:30 - 17:30	<p><b>Session 4: State-of-the-art lecture.</b></p> <p>Assessment of the immunological response in the liver using liver fine needle aspiration</p>	Dr Uppy Gill

DAY 2		
09:15 - 11:15	<p><b>Session 1: Hands-on-session 3</b></p> <p>Group 3&amp;4: Processing liver tissue obtained at FNA, biopsy and resection for immunological techniques</p> <p>Group 5: ICS and Multiparameter flow cytometry</p> <p>Group 1&amp;2: scRNAseq library prep</p>	<p>Dr Tamsin Cargill Dr Rory Peters Dr Helen Ferry Dr Leo Swadling Dr Sam Murray Dr Lucy Garner</p>
11:15 – 11:45	Coffee break	
11:45 – 12:45	<p><b>Session 2: Integrative analysis/systems immunology of multimodal experimental data.</b></p> <p>Analysis of datasets generated by techniques demonstrated in hands-on-sessions</p> <ul style="list-style-type: none"> <li>- ICS and multiparameter flow cytometry</li> <li>- scRNAseq</li> <li>- integrative analysis</li> </ul>	<p>Dr Tamsin Cargill Dr Sam Murray Dr Helen Ferry Dr Lucy Garner Dr Sam Murray</p>
12:45 – 13:00	<b>Session 3: Conclusions and close</b>	<p>Prof Ellie Barnes Prof Paul Klenerman Dr Emma Culver</p>