The 22\textsuperscript{nd} Cambridge Immunology Forum
“Cancer at the interface of immunity, metabolism and microbiota”

Queens’ College, Cambridge
23 September 2022

Organisers: Menna Clatworthy and Arthur Kaser

Coordinators: Tammy Dougan, Laura Messer and Suzanne Diston
Programme

08:30 Registration and Coffee

09:15 Welcome

Session 1: Chair – Menna Clatworthy
09:15 Tom Gajewski (USA)
Commensal microbiota and germline variants can regulate anti-tumor immunity through myeloid cells

10:00 Trevor Lawley (Cambridge)
Making medicines from the human microbiome

10:45-11:15 Coffee and Posters

Session 2: Chair – Clare Bryant
11:15 Kathy McCoy (Canada)
The role of the microbiota in promoting cancer immunotherapy: defining mechanisms

12:00 Virginia Pedicord (Cambridge)
Functional mapping to translate between mouse and human microbiota research

12:45 Lionel Apeloh (France)
TH9 cells in anticancer immunity

13:30 – 14:30 Buffet Lunch and Posters

Session 3: Chair – Nick Matheson
14:30 Arthur Kaser (Cambridge)
A purine metabolic checkpoint of immunity

15:15 Romina Goldszmid (USA)
Microbiota shapes the tumor immune landscape

16:00 – 16:40 Coffee and Posters

Session 4: Chair – James Nathan
The Michael Neuberger Lecture
16:40 Matt Vander Heiden (USA)
How tissue nutrient availability influences cancer progression and immunity

17:20 Justin Cross (USA)
MAIT and Vd2 unconventional T cells predict favorable outcome following allogeneic hematopoietic cell transplant and are supported by a diverse intestinal microbiome

18.00 Poster winners. Close and thanks

18:05 Drinks and 18.30 Conference Dinner
<table>
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<th>Speakers’ Biographies</th>
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| **Professor Tom Gajewski (USA)**  
Department of Pathology, University of Chicago | Professor Gajewski investigates and develops new treatments for patients with melanoma. He has a special interest in the development of immunotherapies against this disease. Prof Gajewski also leads development of immune-based therapies for other cancers, using new laboratory data on how the immune system is regulated to develop novel clinical trials. He serves as an editor for *Cancer Research* and *Journal for Immunotherapy of Cancer*. In addition, he is immediate past president of the Society for Immunotherapy of Cancer and has served on the program committees for the American Society for Clinical Oncology (ASCO) and the American Association for Cancer Research (AACR). |
| **Dr Trevor Lawley (UK)**  
Faculty Group Leader of Host-Microbiota Interactions Team, Wellcome Trust Sanger Institute | Dr. Trevor Lawley is a Faculty member at the Wellcome Sanger Institute (www.lawleylab.com) and the Chief Scientific Officer of Microbiotica (www.microbiotica.com). Trevor’s research is focused on developing concepts, methods and tools to enable basic discoveries and translation of medicines and diagnostics from the human microbiome. His science uses large-scale genomics and data driven approaches in patient cohorts, underpinned by metagenomic analysis, microbial culturing and machine learning, to investigate the biology of human microbes that are associated with health and a range of diseases, syndromes and developmental disorders. Trevor has trained scientists who have established independent academic research labs and have pioneered the human microbiome biotechnology sector. Research by Trevor and his students has been published in *Nature*, *Nature Immunology*, *Nature Genetics*, *Cell* and *Nature Biotechnology*, and has been featured on BBC, CNN news and highlighted in The Economist. In December 2016, Trevor spun out the biotech company Microbiotica to develop live bacterial therapeutics, biomarkers and microbiome-based technologies focused on treating patients with autoimmune diseases and cancers. Microbiotica is developing live bacterial therapeutic products, defined consortia of bacteria, as novel medicines for ulcerative colitis patients and melanoma immunotherapy patients. |
| **Professor Kathy McCoy (Canada)**  
Department of Physiology and Pharmacology, University of Calgary | Professor McCoy obtained her PhD in Immunology from the Malaghan Institute of Medical Research, Otago University, Wellington, New Zealand. She performed her postdoctoral studies and was a junior group leader at the Institute of Experimental Immunology in Zürich, Switzerland. In 2006 she joined McMaster University as an Assistant Professor where she held a Canada Research Chair in Mucosal Immunology. From 2010–2016 Kathy McCoy was an Assistant Professor in Mucosal Immunology in the Department of Clinical Research, University of Bern in Switzerland. In Sept. 2016 she returned to Canada and is now a Professor in the Cumming School of Medicine, University of Calgary where she continues her research on host-microbial interactions with a focus on early life. |
### Dr Virginia Pedicord (UK)
**Group Leader, University of Cambridge**

Virginia Pedicord received her PhD in Immunology and Microbial Pathogenesis from Cornell University under the supervision of Dr. James P. Allison at Memorial Sloan Kettering Cancer Center in New York. There she studied how CD8+ T cell survival, differentiation and function in vivo are shaped by activation in the contexts of IL-10 inhibition, immune checkpoint blockade and metabolic manipulation. She went on to complete her postdoctoral training at the Rockefeller University, where she began investigating the role of the gut microbiota in T cell-mediated immunity and intestinal barrier function and joined the University of Cambridge Department of Medicine and Cambridge Institute of Therapeutic Immunology & Infectious Disease (CITIID) as a Sir Henry Dale Fellow in 2018. Her research group studies how interactions with gut microbes and microbial metabolites affect resistance to infection, local and systemic T cell responses and the gut-brain axis of neuronal function.

### Dr Lionel Apeloh (France/ USA)
**INSERM**

After completing his PhD on the molecular mechanisms of immunogenic tumor cell death, he performed his postdoctoral work in Boston, MA, USA, where he worked on CD4 T cell transcriptional regulation and CD8 T cells in cancer. When returning to France in late 2010, he worked as a group leader at INSERM on a novel subset of CD4 T lymphocytes: IL-9-producing CD4 T cells (Th9 cells). Thanks to the support from the French National Research Agency and subsequently from the European Commission, his group showed that Th9 cells mediate potent anticancer activities in vivo upon adoptive transfer (Végran et al., *Nat. Immunol.*, 2014; Rivera Vargas et al., *Nat. Commun.*, 2017; Benoit-Lizon et al., *J. Immunother. Cancer*, 2022). His group currently pursues investigations on the molecular mechanisms endowing T cells with anticancer functions.

### Professor Arthur Kaser (UK)
**Professor of Gastroenterology, University of Cambridge**

Arthur Kaser is Principal Investigator at the Cambridge Institute of Therapeutic Immunology and Infectious Disease, Professor of Gastroenterology at the University of Cambridge, and Honorary Consultant Physician at Addenbrooke’s Hospital. Supported by the Wellcome Trust and European Research Council, his laboratory has discovered important mechanisms of inflammatory bowel disease, including biochemical ones that have challenged fundamental principles of central purine metabolism. Arthur is a Fellow of the Academy of Medical Sciences, member of the Henry Kunkel Society, and was the Founding Chair of the Research Board of United European Gastroenterology (UEG), and Associate Editor of Gut. Arthur qualified in 1996 from Leopold Franzens University Innsbruck, and held previous posts in Innsbruck and at Harvard Medical School’s Brigham and Women’s Hospital.
Dr Romina Goldszmid (USA)
Laboratory of Integrative Cancer Immunology, NCI/CCR

Dr. Romina Goldszmid received her Ph.D. working on dendritic cell-based vaccines for melanoma immunotherapy from the University of Buenos Aires, Argentina, part of which was performed as a visiting scholar in the laboratory of Dr. Ralph Steinman at the Rockefeller University. She then did her postdoctoral training in infectious disease immunology with Dr. Alan Sher in the Laboratory of Parasitic Diseases (LPD) at the National Institute of Allergy and Infectious Diseases (NIAID), NIH. Dr. Goldszmid then returned to tumor immunology, joining Dr. Giorgio Trinchieri's laboratory at CCR, NCI, as a Staff Scientist. She is now an NIH Earl Stadtman Investigator in the Laboratory of Integrative Cancer Immunology and an Adjunct Investigator in LPD, NIAID.

Professor Matt Vander Heiden (USA)
Professor of Molecular Biology, MIT Department of Biology

Professor Vander Heiden is the director of the Koch Institute at MIT, the Lester Wolfe (1919) Professor of Molecular Biology, and a member of the Broad Institute. He is a practicing oncologist and instructor in medicine at Dana-Farber Cancer Institute/Harvard Medical School. He earned his doctoral and medical degrees from the University of Chicago, where he worked in the laboratory of Craig Thompson. Vander Heiden then completed a residency in internal medicine at Boston’s Brigham & Women’s Hospital and a hematology-oncology fellowship at Dana-Farber Cancer Institute/Massachusetts General Hospital. He was a postdoctoral fellow in the laboratory of Lewis Cantley at Harvard Medical School, where he was supported by a Mel Karmazin Fellowship from the Damon Runyon Cancer Research Foundation. In 2010, Vander Heiden joined the MIT faculty. His work has been recognized by many awards including the Burroughs Wellcome Fund Career Award for Medical Sciences, the AACR Gertrude B. Elion Award, the HHMI Faculty Scholar Award, and an NCI Outstanding Investigator Award. Vander Heiden serves on the scientific advisory board of Yale Cancer Center, Agios Pharmaceuticals, Aeglea Biotherapeutics, iTeos Therapeutics, Evelo Therapeutics, CyteGen, and Auron Therapeutics, of which he is also an academic founder. He is part of the investment advisory board for DROIA Venture Fund.

Dr Justin Cross (USA)
Donald B. and Catherine C. Marron Cancer Metabolism Center at Memorial Sloan Kettering Cancer Center in New York City

Justin is director of the Donald B. and Catherine C. Marron Cancer Metabolism Center at Memorial Sloan Kettering Cancer Center in New York City. He earned his undergraduate in Natural Sciences from Queens’ College Cambridge and his Ph.D. from University College London, working in the laboratory of Dr. Julian Downward Cancer Research UK on the regulation of apoptotic cell death. In 2006 Justin joined Craig Thompson’s laboratory at the University of Pennsylvania to study lipid metabolism and the emerging role of Isocitrate Dehydrogenase mutations in cancer. While in Philadelphia, Justin also gained an interest in applying mass spectrometry to study cancer metabolism and in 2013 he established the Donald B. and Catherine C. Marron Cancer Metabolism Center at MSK. His laboratory operates as a hybrid core and research group providing investigators with access to metabolomic technologies. Justin’s research interests are focused on understanding alterations in mitochondrial metabolism in cancer and, more recently, to applying metabolomics to host-microbiome interactions.
Thank you to everyone who has taken part in and supported this event.

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Posters

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Outstanding PhD poster and Outstanding Post-doc poster

Forum Contacts

Prof Menna Clatworthy, Prof Arthur Kaser, Prof Clare Bryant
Prof Brian Ferguson (Cambridge BSI)