

LH Gray Meeting - Developments in Pre-clinical and clinical imaging of relevance to radiobiology research

This meetings consisted of expert overviews of current developments in pre-clinical and clinical imaging, focussed on topics that will interest the radiotherapy research community. There were 4 pre-recorded presentations which are each 30 minutes long, plus a live discussions session involving all speakers for approximately 45 minutes.

Speakers

Professor Hamid Dehghani, University of Birmingham “Optical Imaging in the pre-clinical and clinical setting”

Hamid Dehghani is the Professor of Medical Imaging in the School of Computer Science at the University of Birmingham. He has published over 100 peer reviewed journal papers in the area of image reconstruction and numerical modelling and has a long and established track record in the development of biophotonics based techniques with specific applications in in-vivo optical imaging. He is the core developer of NIRFAST (a modelling and computational toolbox for molecular imaging), which, through funded projects, is now an open-source software widely available to the international research community. He was the first to publish the use of model-based image reconstruction algorithms for the formation of 3D functional images of breast cancer using spectral data. He has worked on EPSRC and National Institute of Health (NIH, USA) funded programmes for developing novel optical imaging techniques for detection and characterisation of breast cancer, development of optical imaging methods with direct applications in neuroimaging as well as dual-modality pre-clinical imaging systems for luminescence biomarkers.

Professor Phillippe Lambin, University of Maastricht “CT-based handcrafted and deep radiomics for Radiation Oncology”

Phillippe Lambin is head of the "disease agnostic" Department of Precision Medicine which has three units: The D-lab, The M-lab and the Virtual Trial Unit+ (www.precisionmedicinemaastricht.eu). - The D-Lab focusses on Decision Support Systems & quantitative imaging, and a molecular/wet lab - The M-Lab, focussing on the tumour microenvironment and Clostridium-based therapies and a trial unit. He is a Clinician, Radiation Oncologist, PhD in molecular Biology and pioneer in translational research with a focus on Tumour hypoxia, Radiomics, Living Medicine and Decision Support Systems. He is a “ERC advanced & ERC PoC (2x) grant laureate” from 2016, 2018 & 2020 and he is co-author of more than 530 peer reviewed scientific papers (Hirsch Index - Google scholar: 100), co-inventor of more than 20 patents (filed or submitted) of which 6 are in the (pre)commercialization phase and (co) promoter of more than 60 completed PhD's (2 with cum laude). Prof Lambin has been also a member of the scientific advisory committee of KWF (the main Dutch funding body in cancer research), NKI-AVL, Institut Curie, Royal Marsden, CERN, CRC UK and of the advice committee on protontherapy of CVZ (the Dutch medical insurance). He is currently involved in several successful European grants (e.g. CDPT, Biocare, Euroxy, Metoxia, euroCAT, Eureka, Artforce, Radiate, Requite, BD2decide, ImmunoSABR, PREDICT, Euradiomics, Dragon, EuCanImage, Chaimeleon, iCOVID...) and

two NIH grant from the US (“Radiomics”). His main areas of interest are directed towards translational research in Oncology with a specific focus on tumour hypoxia, living medicine with genetically engineered bacteria, functional imaging, lung and head and neck cancer. More recently his interests have been directed towards the development of “treatment decision support system” based on multiparametric databases containing clinical, imaging, biological and therapeutic information, and taking into account patient preferences

Dr. Simon Robinson, Institute for Cancer Research "Imaging Tumour Hypoxia with MRI for Radiotherapeutic Gain"

Dr. Simon Robinson is a Team leader in pre-clinical MRI. He graduated from City University, London, with a BSc (Hons) degree in Biological Chemistry and then pursued a PhD studentship at St Georges, University of London, and secured his PhD entitled “NMR Studies of Tumour Models” in 1995. He continued his post-doctoral studies at St. George’s, exploiting the use of intrinsic susceptibility MRI techniques, based on the blood oxygenation level dependent (BOLD) MRI method, to image tumour pathophysiology, for which he gained international recognition. In 2001, Dr Robinson was awarded a Royal Society University Research Fellowship concerned with the further development and application of non-invasive MRI methods to identify and evaluate quantitative imaging biomarkers of tumour pathophysiology. In 2006, Dr Robinson transferred his Fellowship to the ICR to take up a Career Development Faculty post, leading a pre-clinical MRI team within the (CRUK) Clinical Magnetic Resonance Research Section. Dr Robinson’s research continues to focus on the application of both established and innovative, quantitative functional MRI techniques to evaluate imaging biomarkers of tumour pathophysiology and treatment response in pre-clinical models of cancer. Dr Robinson gained the title of Reader at the ICR in 2019.

Dr. Ian Wilson, Imaginab "Imaging of CD8+ Cells; Clinical Development of Immuno-PET Tracer 89Zr IAB22M2C"

Dr. Ian Wilson is a graduate from University of Manchester with over 25 years’ experience in development of in vivo medical diagnostics and imaging medical devices.

Ian serves as CEO of ImaginAb Inc. a biotechnology company focused on developing radiopharmaceutical imaging and therapy agents. ImaginAb’s lead program is 89Zr CD8 Immuno-PET agent ([89Zr]-Df-IAB22M2C) a minibody that binds the CD8 receptor on human T cells and is used for quantitative, non-invasive PET imaging of CD8 T cells in patients.

Prior to joining ImaginAb Ian was CEO and CTO of Edinburgh Molecular Imaging Ltd, leading the development of novel optical imaging agents to improve cancer detection and surgery, and lung disease. He has held several roles at GE Healthcare between 1996 and 2013, including Portfolio and Strategy Manager and Head of Biology, with responsibility for management of GE Healthcare’s Molecular Imaging Agent Portfolio, in Cardiovascular, Oncology and Neurology, and strategic and tactical oversight. He had responsibility for supporting efficacy and regulatory studies required for the approval of new imaging agents. At Xstrahl Ltd, as CTO & COO, he was responsible for the oversight of the Radiotherapy commercial operation and manufacture oversight, including new product development.