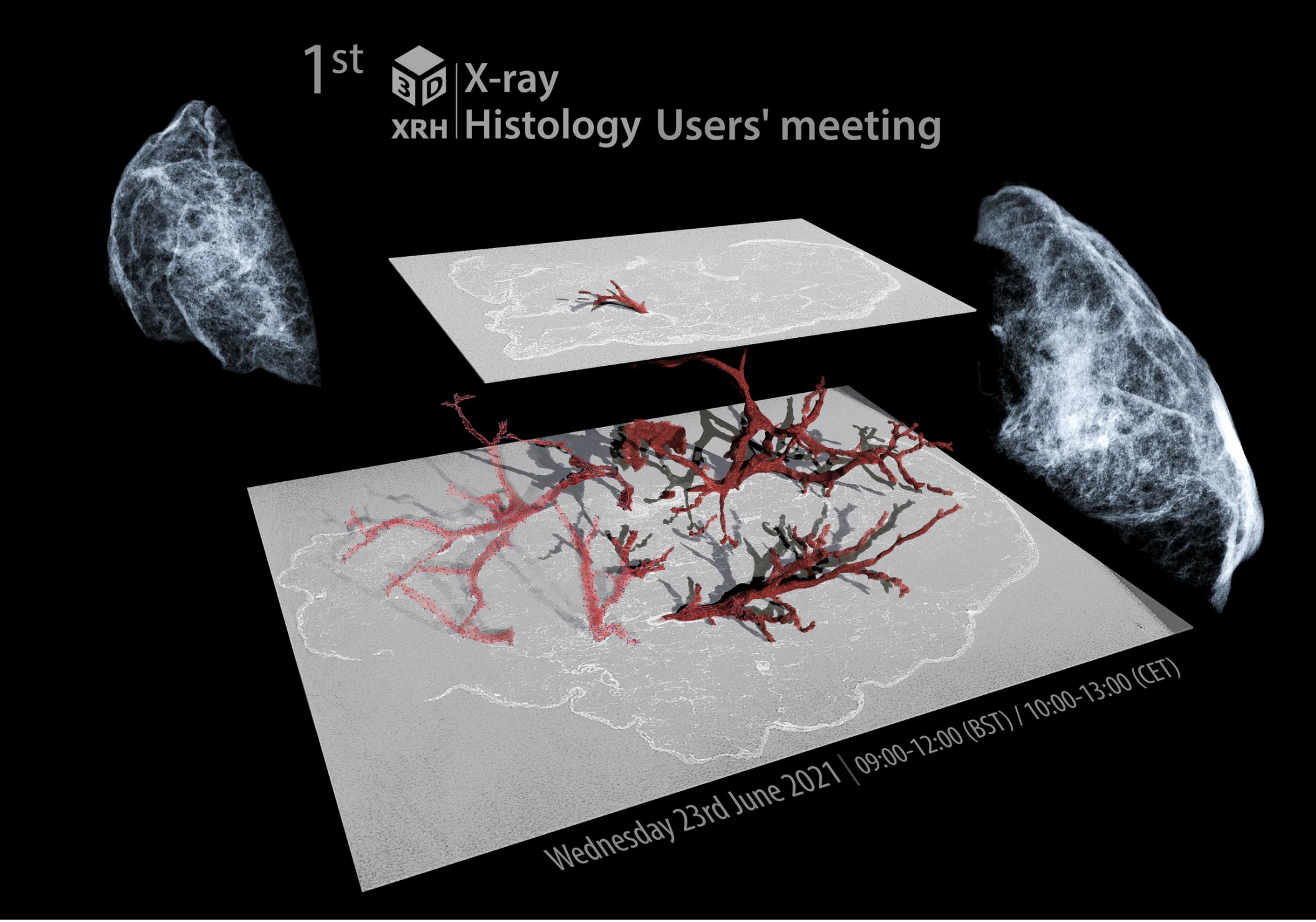

μ-VIS www.muvis.org X-Ray Imaging Centre

wellcome

UNIVERSITY OF Southampton

Biomedical Imaging Unit

SHORT PROGRAMME

JUNE 23, 2021

09:00-12:00 BST (Online)

9:00 AM - 9:15 AM
Welcome and Introduction

9:15 AM - 10:15 AM
Session 1 - Short talks & discussion

10:15 AM - 10:30 AM
Coffee break

10:30 AM - 11:30 AM
Session 2 - Short talks & discussion

11:30 AM - 12:00 PM
Session 3 - General Q&A and feedback

To register for this event, please visit: https://www.eventbrite.co.uk/e/1st-x-ray-histology-users-meeting-tickets-157319696447

µ-VIS www.muvis.org X-Ray Imaging Centre | wellcome | UNIVERSITY OF Southampton | Biomedical Imaging Unit

SPEAKERS & TALKS - Session 1

JUNE 23, 2021 | 09:00-12:00 BST (Online)

9:15 AM - 9:30 AM

Dr. Marie-Christine Zdora - 'Virtual histology by X-ray speckle-based phase tomography'
Paul Scherrer Institut, Villigen PSI, Switzerland; Department of Physics & Astronomy, University College London, London, UK; Diamond Light Source Ltd, Didcot, UK

9:30 AM - 9:45 AM

Amjad Khan - 'Adding the third dimension to histopathology routine: Motivation, significance and challenges ahead'
Institute of Pathology, University of Bern, Bern, Switzerland

9:45 AM - 10:00 AM

Dr. Harry Rossides - '3D X-ray histology provides new insights on early-stage colorectal cancer'
Bioengineering Science Research Group, Faculty of Engineering and Physical Sciences; Clinical and Experimental Sciences (CES), Faculty of Medicine, University of Southampton, Southampton, UK

10:00 AM - 10:15 AM

Sruthymol Lukose - 'Characterisation of eosinophilic inflammation in COPD by blood eosinophilia'
Clinical and Experimental Sciences (CES), Faculty of Medicine, University of Southampton, Southampton, UK

To register for this event, please visit: https://www.eventbrite.co.uk/e/1st-x-ray-histology-users-meeting-tickets-157319696447

µ-VIS www.muvis.org X-Ray Imaging Centre | wellcome | UNIVERSITY OF Southampton | Biomedical Imaging Unit

SPEAKERS & TALKS - Session 2

JUNE 23, 2021 | 09:00-12:00 BST (Online)

10:30 AM - 10:45 AM

Prof. Rohan Lewis - 'X-ray histology and imaging of the placenta'
Human Development and Health, Faculty of Medicine, University of Southampton, Southampton, UK

10:45 AM - 11:00 AM

Dr. Rafael Torres Martin de Rosales - '[68Ga]Ga-THP-Pam: A PET radiotracer for imaging vascular Calcification'
School of Biomedical Engineering & Imaging Sciences, King's College London, London, UK

11:00 AM - 11:15 AM

Prof. Jan von der Thüsen, Janina Wolf, Teodora Trandafir - 'Informing Lung Adenocarcinoma histology specimens using Three-Dimensional X-ray Micro-Computed Tomography of whole tissue blocks.' and '2D and 3D detection of pulmonary thrombotic events in fatal COVID-19 cases'
Erasmus Medical Centre, Rotterdam, Netherlands

11:15 AM - 11:30 AM

Prof. Arnaud Bourdin - 'Deciphering human lung HRCT findings in COPD by using µCT'
Respiratory Department, University of Montpellier, Montpellier, France

To register for this event, please visit: https://www.eventbrite.co.uk/e/1st-x-ray-histology-users-meeting-tickets-157319696447

µ-VIS www.muvis.org X-Ray Imaging Centre | wellcome | UNIVERSITY OF Southampton | Biomedical Imaging Unit

ABSTRACTS - Session 1

9:15 AM - 9:30 AM

Dr. Marie-Christine Zdora - *Paul Scherrer Institut, Villigen PSI, 5232, Switzerland; Department of Physics & Astronomy, University College London, London WC1E 6BT, United Kingdom and Diamond Light Source Ltd, Didcot, Oxfordshire OX11 0DE, United Kingdom*

Title: 'Virtual histology by X-ray speckle-based phase tomography'

Description: 'X-ray phase-contrast imaging can achieve significantly higher contrast for biomedical soft-tissue samples compared to conventional absorption imaging. Among the phase-contrast methods, X-ray speckle-based imaging has seen increasing interest in the last years due to its high sensitivity and robust experimental setup. On the example of a mouse kidney, I will demonstrate that X-ray tomography based on speckle-based phase-contrast imaging is a powerful method for virtual histology. It is capable of delivering high-sensitivity, high-resolution 3D information on the inner structure and density distribution within the sample, not accessible through conventional X-ray imaging.'

9:30 AM - 9:45 AM

Amjad Khan - *Institute of Pathology, University of Bern, Bern, Switzerland*

Title: 'Adding the third dimension to histopathology routine: Motivation, significance and challenges ahead'

Description: 'In diagnostic histopathology, tissues are stained on glass slides and evaluated under the microscope. Recently with the advent of digital pathology, these glass slides can be scanned to produce digital images, which can be used to develop artificial intelligence algorithms. These analyses are performed on limited two-dimensional information that is reflecting from a single slice (cut) of a tissue, thus slide preparation in pathology is crucial and must accurately estimate the location of the anomaly inside the tissue. Eventually, the tissue slice under observation may not contain the anomaly, which often leads to repeat the slide preparation on deeper and deeper sections. This motivates us to combine radiology imaging such as micro-CT technologies to reach the exact location of an anomaly inside the tissue during the slide preparation step. Certainly, using the micro-CT could benefit histopathology; however, there are several challenges ahead that need to be addressed'

9:45 AM - 10:00 AM

Dr. Harry Rossides - *Bioengineering Science Research Group, Faculty of Engineering and Physical Sciences; Clinical and Experimental Sciences (CES), Faculty of Medicine, University of Southampton, Southampton, UK*

Title: '3D X-ray histology provides new insights on early-stage colorectal cancer'

Description: 'Colonic crypts are tubular glands in the large intestine, with a key role in the maintenance of the colonic epithelium and mucosal homeostasis. During the early stages of colorectal cancer (CRC), the fissioning process responsible for crypt multiplication is perturbed, leading in excessive fissioning or budding. To quantify the morphology of budding crypts, 3D X-ray histology was employed. Focus of this talk are specific examples where 3D imaging revealed microstructural insights previously unattainable through traditional 2D paraffin sectioning. These insights elucidate our view of crypt budding in early-stage CRC, paving the way towards better understanding of the underlying biological processes.'

10:00 AM - 10:15 AM

Sruthymol Lukose - *Clinical and Experimental Sciences (CES), Faculty of Medicine, University of Southampton, Southampton, UK*

Title: 'Characterisation of eosinophilic inflammation in COPD by blood eosinophilia'

Description: 'Chronic Obstructive Pulmonary Disease (COPD) is a heterogeneous disease characterised by persistent airflow obstruction. Eosinophilic inflammation has been identified as a treatable-trait in COPD and associated with high blood (>2%) or sputum (3%) eosinophil counts. However, these antibodies targeting IL-5, a cytokine driving eosinophilia, have not significantly reduced symptoms in COPD patients with high eosinophils. The aim of this project is to understand the role of eosinophils in the COPD lung, by determining the expression of eosinophils and IL5Rα within the 3D lung microstructure and their relation to the pulmonary structures.'

ABSTRACTS - Session 2

10:30 AM - 10:45 AM

Prof. Rohan Lewis - *Human Development and Health, Faculty of Medicine, University of Southampton, Southampton, UK*
Title: 'X-ray histology and imaging of the placenta'
Description: 'Placental structure shows incredible diversity between species and our work seeks to understand how such diverse structures perform the same underlying functions and understand the evolutionary pressures that drove the divergence of placental structures. We are using multiscale 3D imaging of placenta from humans and other animals to explore these complex structures in 3D. By combining 3D structures with mathematical modelling, we hope to better understand the structure function relationships in each species and how these determine function.'

10:45 AM - 11:00 AM

Dr. Rafael Torres Martin de Rosales - *School of Biomedical Engineering & Imaging Sciences, King's College London, London, UK*
Title: '[68Ga]Ga-THP-Pam: A PET radiotracer for imaging vascular Calcification'
Description: '[68Ga]Ga-THP-Pam was previously demonstrated to have high affinity towards a number of calcium salts while [18F]NaF, the most used PET radiotracer for bone imaging has high affinity only for hydroxyapatite (the main component of bone mineral). We hypothesised that the broad calcium mineral affinity of [68Ga]Ga-THP-Pam may be advantageous in detection of vascular calcification (VC), where the composition of solid calcium mineral may be more varied than the composition of bone. We report a direct comparison of [68Ga]Ga-THP-Pam and [18F]NaF PET imaging in a rat model of VC, demonstrating that [68Ga]Ga-THP-Pam may offer improved detection of VC in comparison to [18F]NaF, including microcalcifications undetectable by preclinical CT.'

11:00 AM - 11:15 AM

Prof. Jan von der Thüsen, Janina Wolf, Teodora Trandafir - *Erasmus Medical Centre, Rotterdam, Netherlands*
Title: 'Informing Lung Adenocarcinoma histology specimens using Three-Dimensional X-ray Micro-Computed Tomography of whole tissue blocks' and '2D and 3D detection of pulmonary thrombotic events in fatal COVID-19 cases'
Description: ''

11:15 AM - 11:30 AM

Prof. Arnaud Bourdin - *Respiratory Department, University of Montpellier, Montpellier, France*
Title: 'Deciphering human lung HRCT findings in COPD by using µCT'
Description: 'COPD is a devastating lung disease, third leading cause of death worldwide. Lung HRCT acquired at expiration evidences air trapping and emphysematous changes, the first being supposed to precede the second. Thanks to µCT assessment of surgically removed samples with evidence of air trapping at HRCT will offer the unique possibility to unravel the key mechanism involved in COPD progression.'