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NETWORKING

7TH DIGITAL PATHOLOGY & AI CONGRESS: EUROPE

UTILIZING AI & DIGITAL PATHOLOGY TO ADVANCE PATHOLOGY PRACTICE, ENABLE ENHANCED PATIENT CARE AND FURTHER DRUG DISCOVERY

December 3-4 2020

Meeting Commences at 08:50 (GMT, UTC)

#DigiPathGE

www.**global-engage**.com

Global Engage

Global Engage is pleased to announce the **7th Digital Pathology & AI Congress Europe** which will be held virtually on December 3-4. Following on from the successful sold out meetings of the past which had over 450 participants and a full exhibitor hall, Global Engage have used the opportunity of going virtual to expand the event, providing more scope and interactivity.

The online conference will continue to showcase some of the most exciting cutting-edge strategies and analysis techniques as well as cover important issues related to implementation and daily use in the era of Covid-19. It will also explore the continued advances in artificial intelligence and image analysis tools so that digital pathology can be utilized to its full potential.

New to the agenda for 2020 are the interactive roundtable discussions, which have had excellent feedback from the US version of this event, as well as a brand new track providing the opportunity to explore the growing applications and impact of digital pathology in the pharmaceutical sector.

With over 55 presentations from an expert speaker faculty, panel and roundtable discussion sessions, poster presentations, and vendor workshops this is the perfect space to keep up to date with the latest application and research strategies. Virtual vendor booths will also provide the opportunity to interact with those showcasing the latest solutions on the market and answer any questions you may have.

There will also be 2 pre-conference workshops taking place on the 2nd December which are being hosted by Akoya Biosciences and 10x Genomics research towards commercialisation, and partnerships and collaborations.

DIGITAL PATHOLOGY – STRATEGY AND TECHNOLOGY

- Benefits & future developments of Digital Pathology, and the implications for pathology practice
- Analysing the business case for digital pathology
- User experience of converting to/integration of digital pathology
- Standardisation in Digital Pathology
- The regulatory environment for digital pathology: Europe and beyond
- Quality assurance, control and improvement
- Validation methods
- Effects of Covid-19 on pathology practice

DIGITAL PATHOLOGY APPLICATIONS AND RESEARCH CASE STUDIES

- Reviewing standards and national experiences
- Considerations for complete digitalization
- Telepathology and building collaborative networks
- Technology innovation
- Digital image analysis in drug discovery
- Clinical trials support; diagnosis / diagnostics; next generation sequencing; biomarker analysis / research / quantification; tissue-based research / imaging; digital Biobanking

PHARMA/BIOTECH CASE STUDIES

- Applying digital pathology in toxicology pathology
- Digital image analysis in drug discovery
- Clinical trials support; diagnosis / diagnostics; next generation sequencing; biomarker analysis / research / quantification; tissue-based research / imaging; digital Biobanking

AI FOR IMAGING AND DIGITAL IMAGE ANALYSIS

- Examining the latest developments in imaging technologies
- Advances in image quality and scanning speed
- Image processing and registration
- Exploring both manual and fully-automated image analysis and pattern recognition
- Quantitative image analysis research and applications of AI
- Approaches to integrating AI into image analysis workflow
- Visualization methods for diagnosis and prognosis
- 3D imaging
- Overcoming challenges in image analysis
  - Image standardization
  - Troubleshooting guide

COMPUTATIONAL PATHOLOGY AND AI

- Acquisition, processing, archiving & retrieval of WSI
- Advancing machine and deep learning algorithms
- Improving WSI workflow efficiency
- Cloud computing / storage solutions
- Pathology PACS and informatics
- Understanding and integrating computational pathology

PANEL DISCUSSIONS

The Future of Digital Pathology

- Keith Kaplan (Chair) - Chief Medical Officer, Corista
- Anil Parwani - Professor of Pathology, Ohio State University
- Liron Pantanowitz - Professor of Pathology & Director of Anatomical Pathology, University of Michigan
- David Wilbur - Chief Medical Scientist & Pathologist, Corista
- Sonali Natu - North Tees at the North East Cancer Alliance
- Tim Bracey - Service Line Clinical Director, Peninsula Pathology Network

ROUNDTABLE DISCUSSIONS

- **Implementing computational pathology tools in the works space: what will the future look like?**
  Jan Lukas Robertus - Consultant Histopathologist, Royal Brompton and Harefield Hospitals NHS Foundation Trust, Honorary Senior Clinical Lecturer, Imperial College, London

- **Outcome supervised deep learning**
  Johan Lundin - Professor of Medical Technology at the Department of Global Public Health, Karolonska Institutet; Research Director at the Institute for Molecular Medicine Finland (FIMM), University of Helsinki, Finland

PRE-EVENT WORKSHOP
INCLUDED IN YOUR PACKAGE

Agenda Workshop
Sponsored by:

Day 1: Wednesday 2ⁿᵈ Dec 2020 / 09:00-13:00

Revealing Spatial Biology on Every Digital Slide

In this workshop, you'll learn about the importance of multiplex biomarker analysis including how advances in multiplexed immunofluorescent imaging and analysis at any-scale, any-plex can reveal biological and spatial information.

1. How Spatial Biology reveals cellular interactions across whole tissue sections,
2. How automation can speed up discovery: Automating multiplexed immunofluorescence workflows from staining through analysis
3. A deep understanding of how multispectral unmixing isolates desired signal from background autofluorescence
4. How phenotypic spatial metrics can enable better prediction of immunological therapeutic

Daniel Vaughan   Virginie Goubert   Ros Lloyd   Anna Tosi   Ian Beh

Ellen Van Obberghen-Schilling   Robert Stad   Gavin Gordon   Björn Wendik

Introduction + Welcome
09:00 Daniel Vaughan - Sales Manager, Americas Akoya Biosciences

09:05 Unparalleled Simplicity: MOTiF™ Panel Kits for Validated, plug-and-play mIF Tissue Staining
Virginie Goubert - Applications and Business Development Akoya Biosciences

Certainty in Imaging: Autofluorescence isolation for improved data confidence
09:30 Ros Lloyd - Senior Application Scientist Akoya Biosciences

Immune cell composition associated with overall survival in metastatic uveal melanoma
09:50 Anna Tosi - Researcher at Department of Surgery Oncology and Gastroenterology Oncology and Immunology Division University of Padua

Multiplex imaging to assess the immunosuppressive ability of tumour-associated neutrophils in pancreactic ductal adenocarcinoma.
10:15 Ian Beh - University Hospitals Birmingham

Integrating spatial features of the immune-ECM axis for a deeper understanding of the tumor microenvironment
10:40 Ellen Van Obberghen-Schilling - Institut de Biologie Valrose

Unleashing the Power of Codex
11:05 Robert Stad - Akoya Biosciences Snr. Apps Specialist

Clinical /Translational Pathway
11:30 Gavin Gordon - PhD A VP, Clinical Market Development Akoya Biosciences

Proxima - Spatial Biology Analysis: Anywhere, Anytime
Björn Wendik - Akoya Biosciences Snr. Apps Specialist

PRE-EVENT WORKSHOP

Optional Workshop - Register to Book Your Free Place
www.global-engage.com/event/virtual-workshop-10x-genomics

Agenda Workshop
Sponsored by:

10x GENOMICS

Day 1: Wednesday 2nd Dec 2020 / 14:00-15:00

Christophe Fleury
Senior Science & Technology
Advisor, 10x Genomics

Eva Gracia Villacampa
Dept. of Gene Technology, KTH,
Science for Life Laboratory

14:00-14:05: Welcome & Introductions

14:05-14:25: Understanding diversity and heterogeneity in the context of disease
Christophe Fleury - Senior Science & Technology Advisor, 10x Genomics

Assessing gene expression with morphological context is critical to our understanding of biology and the progression of disease. Historically, it has been challenging to spatially interrogate complex heterogeneous tissues in a high-throughput manner, especially without previously generated assumptions about the genes being expressed. With Visium Spatial Solutions researchers can now map the whole transcriptome with morphological context. Learn how Visium Spatial Solutions from 10x Genomics give you a comprehensive understanding of the relationships between cellular function, phenotype, relationships, and location in intact tissue sections. Enabling deeper insight into cancer, immunology, neuroscience, developmental biology, and beyond, Visium Spatial Solutions give researchers the ability to discover more by seeing biology at true resolution. Discover novel insights into normal development, disease pathology, and clinical translational research.

14:25-14:45: Genome-wide Spatial Expression Profiling in FFPE tissues
Gracia Villacampa - Dept. of Gene Technology, KTH, Science for Life Laboratory

Formalin-fixed paraffin embedding (FFPE) is the most widespread long-term tissue preservation approach. We developed a procedure to perform genome-wide spatial analysis of mRNA in FFPE tissue sections. The procedure takes advantage of well-established, commercially available methods for imaging and spatial barcoding using slides spotted with barcoded oligo(dT) probes to capture the 3' end of mRNA molecules in tissue sections. First, we conducted expression profiling and cell type mapping in coronal sections from the mouse brain to demonstrate the method's capability to delineate anatomical regions from a molecular perspective. Second, we explored the spatial composition of transcriptomic signatures in ovarian carcinosarcoma samples using data driven analysis methods, exemplifying the method's potential to elucidate molecular mechanisms in heterogeneous clinical samples.

AGENDA WORKSHOPS

INCLUDED IN YOUR PACKAGE

Agenda Workshop
Sponsored by:

IBEX

Day 1: Thursday 3rd Dec 2020 / 13:30-14:30

Juan C. Santa Rosario
MD, FCAP FASCP, Medical
Director at CorePlus

Stuart Shand
Chief Commercial Officer,
Ibex Medical Analytics

My First 1,000 AI Cases

In this presentation, we present the first deployment in the United States of an artificial intelligence (AI) powered solution for cancer detection in pathology.

There has been a surge in demand for diagnostic tests in recent years, alongside an increase in cancer prevalence. These trends coincide with a decline in the number of pathologists, leading to increasing workloads and concerns about diagnostic accuracy.

CorePlus, a pathology laboratory from Puerto Rico, has recently completed the first United States deployment of an AI-powered digital pathology solution for detecting prostate cancer. The deployment integrates Ibex's Galen™ Prostate, a clinically validated AI solution that helps pathologists obtain 100% quality control by providing AI second reads on all prostate biopsies, raising an alert in case of a suspected misdiagnosis (e.g. missed cancer).

In this talk, we present Galen™ Prostate, the clinical evidence demonstrating its performance, the deployment at CorePlus and preliminary data and impressions from using it in routine clinical practice.

Agenda Workshop
Sponsored by:

PHILIPS

Day 1: Thursday 3rd December 2020
11:30-12:30

Shira Segal
Product Manager, Philips

We are excited to share our latest release with you straight from our Customer Experience Center, featuring a completely redesigned User Experience. See how the digital slide tray provides a clear overview with all information in one place, how your worklist can be personalized and see tools showcased that boost tissue analysis.

AGENDA WORKSHOPS

INCLUDED IN YOUR PACKAGE

Agenda Workshop
Sponsored by:

Day 2: Friday 4ᵗʰ Dec 2020 / 11:00-12:00

Carla Leibowitz
Chief Business Development
Officer, Paige

Alain Borczuk
MD, Chief of Thoracic Pathology
and Professor of Pathology at
Weill Cornell Medicine

Requirements for AI-based digital diagnostics to be useful in real-life practice

AI is poised to bring breakthrough benefits to patients, healthcare system and laboratories. AI-powered digital diagnostics can help patients get accurate and precise diagnoses, health systems be more efficient and help laboratories streamline workflows and save time. Yet we know that AI in clinical practice has its pitfalls and have seen it fail in the past.

During this talk, Carla Leibowitz, Chief Business Development Officer at Paige, will discuss best practices for developing and using AI-based digital diagnostics in real-life practice to aim for success and avoid common pitfalls. And Alain Borczuk, MD, Chief of Thoracic Pathology and Professor of Pathology at Weill Cornell Medicine will present a recent clinical study that analyzes how the use of Paige's cancer detection technology by GU pathologists to interpret prostate needle biopsy slides enhances quality by influencing post- signout sensitivity and specificity, as well as efficiency. In addition, information on the Paige Platform, a comprehensive software solution that is available for use today and is inclusive of a viewer and storage capabilities and product demo will be presented. Margaret Horton, Business Lead of Europe at Paige will be available for the Q&A.

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Chairman of the Department of Pathology, CRO, Istituto Nazionale Tumori – Aviano

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Digital Pathology Fellow, Leeds Teaching Hospitals NHS Trust and the University of Leeds

DARREN TREANOR
Consultant pathologist, Leeds Teaching Hospitals NHS Trust; Honorary professor, University of Leeds; Guest professor in digital pathology, Linköping University

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Head Medical Physics, Leeds Teaching Hospitals NHS Trust and the University of Leeds

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Chief Medical Officer, Corista

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Consultant Pathologist and Pathology Clinical Lead for Technology, NHS Greater Glasgow and Clyde

INTI ZLOBEC
Professor & Head of the Translational Research Unit at the Institute of Pathology, University of Bern

JAN LUKAS ROBERTUS
Consultant Histopathologist, Royal Brompton and Harefield Hospitals NHS Foundation Trust, Honorary Senior Clinical Lecturer, Imperial College, London

JULIEN CALDERARO
Full Professor Pathology, Henri Mondor University Hospital, Créteil, France

JOHAN LUNDIN
Professor of Medical Technology at the Department of Global Public Health, Karolonska Institutet; Research Director, Institute for Molecular Medicine Finland (FIMM), University of Helsinki, Finland

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LIRON PANTANOWITZ
Professor of Pathology & Head, Pathology Department, Radboud UMC

LUISA MOTTA
Professor of Pathology & Head, Pathology Department, Radboud UMC

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MUHAMMAD ASLAM
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SHAWN O'NEIL
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MD, FCAP FASCP, Medical Director at CorePlus

FRIEDRICH FEUERHAKE
Attending Physician/ Associate Professor, Institute of Pathology, Medizinische Hochschule Hannover

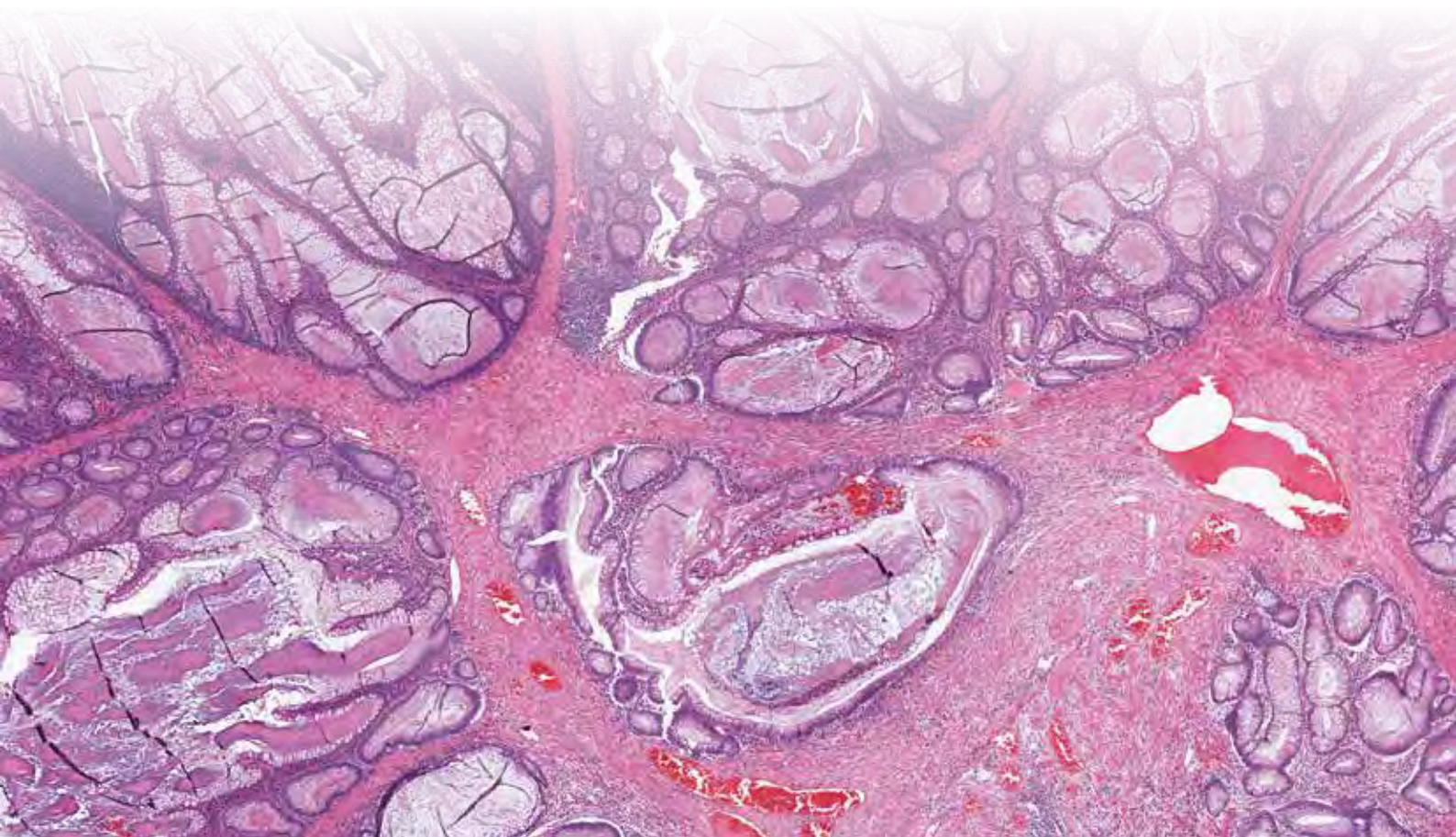**STUART SHAND**
Chief Commercial Officer, Ibex Medical Analytics

CHRISTOPHE FLEURY
Senior Science & Technology Advisor, 10x Genomics

DAVID SNEAD
Consultant Pathologist UHCW NHS Trust and Director of PathLAKE

LANCE MIKUS
Director, Product Management – Imaging Solutions, Leica Biosystems

08:50-09:00 | Global Engage Welcome Address

09:00-09:40

KEYNOTE ADDRESS:
DARREN TREANOR
Consultant pathologist, Leeds Teaching Hospitals NHS Trust; Honorary professor, University of Leeds; Guest professor in digital pathology, Linköping University
National Pathology Imaging Co-operative (NPIC)
NPIC links over 30 hospitals across England with the aim of full digitisation of pathology services, underpinning the development and evaluation of artificial intelligence. NPIC will create a National Vendor Neutral Archive for digital pathology, creating over 3 Petabytes of image data per year and act as a platform for the NHS to innovate in digital pathology and beyond.

09:40-10:20

KEYNOTE ADDRESS:
KATRIEN GRÜNBERG
Professor of Pathology & Head, Pathology Department, Radboud UMC, The Netherlands
Digital Pathology Future; Stock and Options
In 2018 I presented the exiting development of our national pathology image exchange platform in The Netherlands and our first steps on the path to digitising our department of Pathology; a "Brave New World" indeed. Last year, we had a reality check and I shared our experiences in "Digital Pathology going Dutch". Now, we are facing the future of incorporating AI in our daily work. Time to take stock and discuss the options.

10:20-10:50

ERIC WIRCH
Chief Technology Officer, Corista LLC
DAVID WILBUR
Chief Medical Scientist & Pathologist, Corista
Teleconsultation in Pathology: Optimizing Infrastructure to Achieve Best Practices

corista

Teleconsultation is one of the premier functionalities that digital pathology addresses. The ability to instantly share digital cases with colleagues inside and outside of one's institution brings improvement in accuracy and efficiency. The added benefit of insourcing expert teleconsultations adds new and more efficient revenue streams to subspecialized centers. The concept of teleconsultation brings multisite systems together as one, and can create virtual subspecialty networks within an organization whether geographically separated or not. Creating the correct infrastructure for internal, external, multisite, and expert subspecialty teleconsultation is important to achieve maximal efficiency. Each task requires unique architectural features. This session will review the various modes of teleconsultation and the unique infrastructures which best enable each of them.

10:50-11:30 | Morning Break / Poster Presentations / Exhibition Time

11:30-12:00

FAYYAZ UL AMIR AFSAR MINHAS
Assistant Professor, PathLAKE Consortium, Department of Computer Science, University of Warwick, UK
Whole Slide Images are Graphs
In this presentation, we shall explore how graphs can be a natural way of modeling pathology whole slide images (WSIs) for a variety of computational pathology problems. Specifically, we shall explore how a graph-based model of WSIs can lead to improved visualization for the pathologist and aid them in uncovering interesting aspects of the tissue under study. Furthermore, we shall also discuss how graph-based machine learning models can offer improved prediction performance for a number of large-scale computational pathology problems.

11:30-12:00

VANESSA SCHUMACHER
Head of Digital Pathology and Tissue Technologies, Biomarkers, Bioinformatics and Omics & Pathology, Roche Innovation Center, Basel
Digitalization of Toxicologic Pathology
This talk will describe digitalization of the toxicologic pathology workflow, including:
- Case for digitalization of toxicologic pathology
  - benefits of digital slide evaluation compared to glass
  - user experience
  - enabling AI integration
- Using illustrative examples from our digitalization program

WORKSHOP
11:30-12:30 by Philips

PHILIPS

Further details on page 6

AI FOR IMAGE ANALYSIS AND ADVANCEMENTS IN IMAGING

12:00-12:30

INTI ZLOBEC
Professor & Head of the Translational Research Unit at the Institute of Pathology, University of Bern
From artificial intelligence to multiplexing: exciting avenues for next-generation Tissue Microarrays
Tissue microarrays (TMAs) are indispensable tools for tissue-based research. Our group at the Institute of Pathology, University of Bern, creates next-generation Tissue Microarrays (ngTMA®) using digital pathology as a foundation. We have generated >700 ngTMA blocks from a large number of tumor entities, totalling more than 175'000 tissue punches from an estimated 12'000 patients. Projects become increasingly personalized and complex. Future trends include 1) multiplexing, 2) DNA /RNA sequencing projects and 3) artificial intelligence applications. TRU has assembled a massive repository of pathologist- annotated images through the ngTMA facility including whole slide H&Es and tissue microarray spots, linked to corresponding clinical and histopathological data- a virtual goldmine for training machine learning algorithms.

12:30-13:00

KATIE MCKINLEY
indica labs
QUANTITATIVE PATHOLOGY
Head of Clinical Sales, Europe, Indica Labs
Integrated Workflow and AI: Realizing the benefits in clinical digital pathology
How AI classifiers and analysis algorithms are integrated into the pathologist workflow is critical to the success of any digital pathology program, and realizing the benefits of digitization. As a global leader in computational pathology, Indica Labs has leveraged over a decade of experience to design a robust, user-friendly, and practical workflow solution for clinical laboratories. In this session we will look at how AI can provide time savings, increased accuracy, and offer an enhanced experience for the pathologist. We will also discuss the some of the key considerations when implementing AI. HaloAP integrates AI and analysis directly into the workflow, while at the same time offering a wide range of tools for anywhere, anytime access to digital slides for busy clinical pathology labs

DIGITAL PATHOLOGY STRATEGY & ACADEMIC CASE STUDIES

12:00-12:30

LUISA MOTTA
Consultant Dermatopathologist, Salford Royal NHS Foundation
AI: Exploring "new" dilemmas
As digital pathology and artificial intelligence applications advance, and investment in these areas expands, little is heard about the new dilemmas that disruptive technologies present to diagnostic medical specialties. Is it too soon to discuss if changes are needed to improve the ethical, legal, governance and policy-making frameworks? A thought-provoking presentation and conversation starter, raising awareness about aspects of these dilemmas and the need for proactive engagement from the histopathology community to ensure the needs of the specialty are met and patients are protected.

12:30-13:00

JOE LENNERZ
Massachusetts General Hospital, Center for Integrated Diagnostics, Boston, MA
D&LL
Technologies
DICOM - Back to the Future
The first standard entitled "Digital Imaging and Communications" (DICOM) was released in 1985 - the same year that Marty McFly time-traveled at 88 miles per hour in Doc Browns DeLorean. Why is this standard so valuable? This session will provide a primer regarding the value proposition of standards, including DICOM, for digital pathology adoption. Do you think DICOM is ready for the 1.21 gigawatts of AI in pathology?

PHARMA/ BIOTECH PRESENTATIONS

12:00-12:30

THOMAS MROWIEC
Scientific Director, Digital Pathology Project Lead, Merck Healthcare KGaA
Digital Scoring of PD-L1 IHC as a predictor of outcome in NSCLC patient samples
Assessment of programmed death ligand-1 (PD-L1) protein expression using immunohistochemistry (IHC)-based tests is currently the only approved biomarker guiding treatment of non-small cell lung cancer (NSCLC) with checkpoint inhibitors. We retrospectively applied a novel digital pathology (DP) solution that mimics the conventional tumor proportion scoring (TPS) of PD-L1. The exploratory DP solution was developed and validated using samples from patients enrolled in first and second line (1L and 2L) NSCLC cohorts. Efficacy analyses were conducted for overall survival (OS) and progression-free survival (PFS). Our results demonstrate the technical feasibility, robustness, and utility of DP in scoring PD-L1 IHC in clinical trial samples, achieving comparable performance to conventional, semiquantitative pathologist scoring. Furthermore, our study supports the manual pathologist scoring algorithm (TPS scoring) in NSCLC.

12:30-13:00

30 Minute Solution Provider Presentation
For sponsorship opportunities please contact Nick Best / Gavin Hambrook at **sponsorship@globalengage.co.uk**
+44 (0) 1865 849841

WORKSHOP
Continued

PHILIPS

13:00-13:30 Lunch

PHILIPP SCHNEIDER
Professor in Biomedical Imaging, University of Southampton

3D X-ray histology: new imaging technology for histology in 3D

In collaboration with industry and as a partnership between Medicine and Engineering at the University of Southampton, we developed a custom-design and soft-tissue optimised µCT scanner for 3D X-ray histology (Katsamenis et al., http://dx.doi.org/10.1016/j.ajpath.2019.05.004), which allows imaging of standard formalin-fixed, paraffin-embedded biopsy specimens, which can be seamlessly integrated into conventional histology workflows, enabling nondestructive 3D imaging of soft tissue microstructures, resolving structural connectivity and heterogeneity of complex tissue networks, such as the vascular network or the respiratory tract. Currently, we are establishing the foundations for routine 3D X-ray histology (www.xrayhistology.org) by (i) developing and integrating new X-ray equipment and standardised & automated workflows for augmented sample throughput, and (ii) drive the uptake of the technology through academic partnerships. We present first results of our 3D X-ray histology approach and portray a vision, how high-throughput and non-destructive 3D histological assessment can offer new opportunities in biomedical research and for clinical translation.

13:30-14:00

1 HOUR PANEL DISCUSSION:
The Future of Digital Pathology

corista

KEITH KAPLAN (Chair)
Chief Medical Officer, Corista

ANIL PARWANI
Professor of Pathology, Ohio State University

LIRON PANTANOWITZ
Professor of Pathology & Director of Anatomical Pathology, University of Michigan

14:00-15:00

GARETH BRYSON
Consultant Pathologist and Pathology Clinical Lead for Technology, NHS Greater Glasgow and Clyde

Digital pathology and AI in clinical practice – a focus on patient safety

Given the dual pressures of public sector funding availability and the well-publicised worldwide shortage of trained pathologists, the focus of achieving digital pathology implementation has centred on efficiency and value for money. However, digital pathology and AI have a critical role to play in improving quality and patient safety. In this presentation I will review what safety improvements digital pathology can bring today, and examine what the future might hold.

13:30-14:00

DAVID BRETTLE
Head Medical Physics, Leeds Teaching Hospitals NHS Trust and the University of Leeds

Considerations for digital pathology displays

The human interface to the digital image is the display system the image is shown on. This is true for digital pathology yet there is still uncertainty over the importance and requirements for digital pathology displays. This presentation will outline the importance of displays, a methodology for display selection and considerations for QA.

14:00-14:30

SHAWN O'NEIL
Senior Director, Global Microscopic Imaging Lead Global Pathology & Investigative Toxicology, Pfizer Drug Safety Research & Development

Development of an AI APP to Distinguish Abnormal from Normal Images of Rat Kidney Tissue Sections from Toxicological Studies"

Pfizer DSRD collaborated with Visiopharm to develop an AI APP that could distinguish whole slide images of H&E-stained rat kidney tissue sections with normal histology from those containing histopathological lesions, thereby flagging abnormal slides and reducing the workload for veterinary pathologists reading toxicological studies. Although both supervised and unsupervised training methods were explored, neither Generative nor Deep One-Class models of unsupervised training could separate normal versus abnormal slides sufficiently. However, an AI APP was created using supervised training in the Visiopharm AI Architect module that can identify different types of cortical lesions. Logistic regression was trained to predict the slide level abnormality based on areas of detected lesions, and a density-based heatmap was created to visualize the most severely affected regions of selected abnormal images.

13:30-14:00

1 HOUR ROUNDTABLE SESSION:

Table 1: **Implementing computational pathology tools in the works space: what will the future look like?**
JAN LUKAS ROBERTUS
Consultant Histopathologist, Royal Brompton and Harefield Hospitals NHS Foundation Trust, Honorary Senior Clinical Lecturer, Imperial College, London

- The essential difference to introduction and application compared to other modalities in the lab such as immunohistochemistry and molecular and may be more in line with apps as we now see in other areas of AI development, thinking of app stores etc.,
- Information driven application development and question driven application development and the cross over from other areas of AI development.

14:00-15:00

WORKSHOP
13:30-14:30 by IBEX

IBEX

Further details on page 6

14:00-15:00

DAVID WILBUR
Chief Medical Scientist & Pathologist, Corista

SONALI NATU
North Tees at the North East Cancer Alliance

TIM BRACEY
Service Line Clinical Director, Peninsula Pathology Network

14:30-15:00

MUHAMMAD ASLAM
Consultant Pathologist and Clinical Lead, Surgical Pathology Department, North Wales NHS
Experiences of digital pathology

Digital pathology in North Wales project started in 2014 due to centralization of the services from 3 sites to a single site. The process involved complete restructuring of pathology services with heavy reliance on new technology including off site MDT representation and purchase of 4 scanners and implementation of digital pathology. To begin with the digital pathology, a validation program was carried out involving entire Wales, with 22 pathologists being involved in the study. 3000 cases were reported and the results were promising to prove that digital pathology is not inferior to the glass slides in diagnosis. The study was followed by routine reporting of clinical cases digitally. The digital project also included introduction of macropath for macrophotographs embedding in the image viewing software. Likewise the integration was carried out by a middleware application (talking point) to different IT applications including LIMS, e-slide manager and image scope. This way complete integration took place along with touch free voice command / voice recognition. Next we are doing studies on role of AI in the breast receptors assessment.

14:00-15:00

Table 2: **Outcome supervised deep learning**
JOHAN LUNDIN
Professor of Medical Technology at the Department of Global Public Health, Karolonska Institutet; Research Director at the Institute for Molecular Medicine Finland (FIMM), University of Helsinki, Finland

More information can be found at the end of day 1

15:00-15:30

NIKOLAS STATHONIKOS SECTRA
Manager AI development & implementation, UMC Utrecht
AI implementation in clinical practice: hidden challenges and the hidden technical debt

Over the last 8 years, there have been tremendous advances in developing AI models for pathology, either focused on specific tasks or taking on complete diagnostic workflows. These models have achieved performance equivalent to the pathologist, but the uptake has been quite slow in clinical practice. In this session, we will examine the technical challenges and the hidden technical debt associated with implementing AI in clinical practice, while identifying the pitfalls that can threaten the success of such an undertaking.

15:00-15:30

JUAN RETAMERO PHILIPS
Staff Pathologist, Philips Digital and Computational Pathology
Digital Pathology: Experiences of those who have made it from around the World

Digital pathology is slowly being adopted as an alternative to traditional microscopy for routine clinical diagnosis. Digital pathology promises improved lab efficiency, better staff satisfaction and opens the door to computational pathology and integrated diagnostics. But how much of this is true and how much is actually hype? What challenges will your organization encounter in the process towards full digitization? In this talk, Dr Juan A. Retamero, a digital pathology consultant, will share experiences, mistakes and how to avoid them, from those who have transitioned to full digitization from around the world.

15:00-15:30

LANCE MIKUS Leica BIOSYSTEMS
Director, Product Management – Imaging Solutions, Leica Biosystems
Fast Forward to Next Generation Imaging

Digital pathology can offer agility to Anatomic Pathology department who are invested in improving efficiencies and high levels of quality while quickly responding to the increasing pressure of on-demand pathology service. Over the last past years product development teams at Leica Biosystems have studied barriers to scaling up digital pathology by visiting high volume anatomic pathology lab around the world. In this session we will discuss our finding and the innovative features of our next generation imaging system Aperio GT 450 DX

| 15:30-16:00 | Afternoon Break / Poster Presentations / Exhibition Time |

16:00-16:30

SPEED NETWORKING SESSION
Please join us in the 'networking area' for this interactive session. Networking and collaboration is vital in the Digital Pathology communities. As this is a business collaboration forum we have designed this session for you to meet other attendees for a series of 3 minute speed networking video calls. If there is mutual interest – exchange virtual business cards, and arrange a more formal meeting after the session.

JEPPE THAGAARD
Computer Vision & AI Engineer, Team Lead, R&D, Visiopharm

Predictive uncertainty: Knowing what we don't know in image data

Digital image analysis using AI has great utility to standardize data, increase biomarker discovery and aid in diagnostic assessment of disease. For image analysis in clinical applications, AI development relies on indication specific training sets to develop and train the algorithm, as well as separate images for testing. However, once the algorithm leaves the development team, there is an unavoidable element of uncertainty from the vastly greater pool of image sets that algorithm will encounter. How do we know we can trust the models used to develop the APP? Is there a way to test the confidence predictions coming from these models? In this talk, we will provide insights into how we work with concepts of uncertainty and how these affect our development of APPs and datasets for assisting primary diagnosis. We will also give examples from our recent research, development and validation of our lymph node metastasis detection AI APP.

16:30-17:00

JAN LUKAS ROBERTUS
Consultant Histopathologist, Royal Brompton and Harefield Hospitals NHS Foundation Trust, Honorary Senior Clinical Lecturer, Imperial College, London

PRISM - Machine Learning for discovery of Pre-neoplastic Signature in Mesothelioma

Mesothelioma is an aggressive cancer with a five-year survival rate of less than 10% from diagnosis. It is predominantly diagnosed at Stage 3 or 4, in elderly patients when currently available treatments are less effective. Patients who are diagnosed at an older age are often less tolerant of the potentially aggressive treatment pathways. There are currently no diagnostic markers for detecting and screening of pre-neoplastic changes in mesothelial cells. Machine learning approaches offer an opportunity to develop a stage-shift cancer screening model in the diagnosis of mesothelioma and improve survival outcomes for these patients. Identifying novel markers for pre-malignant changes in mesothelial cells will improve surveillance of at-risk patients and identification of early stage cancers in younger patients when treatments may be more effective.

17:00-17:30

TAE HYUN HWANG
Lerner Research Institute, Cleveland Clinic

Machine Learning Driven Spatial Tumor Immune Microenvironment Analysis to Predict Response and Resistance to Immune-checkpoint inhibitors in Gastric Cancer

Retrospective analysis of GC patients treated with Immune checkpoint inhibitors (ICI) showed that there are subsets of GC patients who have significant response to ICI but the molecular mechanisms are largely unknown. We are developing novel machine learning and artificial intelligence algorithms utilizing digital histopathological whole slide images with matched spatial transcriptome data (GeoMx) to 1)understand spatial organization of TILs and MSI-H tumors and 2)perform spatial transcriptome analysis of TILs and MSI-H tumor regions to better understand of ICI response. Our preliminary analysis demonstrates that spatial organization and cellular heterogeneity of TILs and MSI-H tumor cells could provide a novel biomarker to predict ICI response. Our work provides new foundation of how spatial profiling and image analysis for predicting immunotherapeutic responsiveness and new therapeutic targets.

16:30-17:00

SOLÈNE-FLORENCE KAMMERER-JACQUET
Assistant Professor in Pathology, Rennes University Hospital, France

Implementation of digital pathology for routine diagnosis: experience of Rennes University Hospital

Converting a department to digital pathology is always a challenge. We report on the transition to full digital pathology for routine diagnosis and give our experience to overcome pre-analytical difficulties and resistance to change. In the time of COVID-19, with lockdown, digital pathology was particularly adapted to home working with no need to bring any materials. It was also possible to remotely work with residents.

17:00-17:30

ALBERTO ROMAGNONI
Senior Translational scientist, Owkin

HE2RNA, a deep learning model to predict RNA-Seq expression of tumours from whole slide images

Deep learning methods for digital pathology analysis are an effective way to address multiple clinical questions, from diagnosis to prediction of treatment outcomes. These methods have also been used to predict gene mutations from pathology images, but no comprehensive evaluation of their potential for extracting molecular features from histology slides has yet been performed. We show that HE2RNA, a model based on the integration of multiple data modes, can be trained to systematically predict RNA-Seq profiles from whole-slide images alone, without expert annotation. Through its interpretable design, HE2RNA provides virtual spatialization of gene expression, as validated by CD3- and CD20-staining on an independent dataset. The transcriptomic representation learned by HE2RNA can also be transferred on other datasets, even of small size, to increase prediction performance for specific molecular phenotypes. We illustrate the use of this approach in clinical diagnosis purposes such as the identification of tumors with microsatellite instability.

16:30-17:00

NIKOLAI NAOUMOV
Consultant at Novartis, Switzerland

Digital quantitation of histological features in Non-alcoholic Steatohepatitic (NASH)

NASH is the progressive form of non-alcoholic fatty liver disease (NAFLD), characterised by hepatic steatosis, inflammation, hepatocellular injury with various degree of liver fibrosis. Liver histology remains the gold standard for diagnosis of NASH and for assessment of the regulatory approved end-points for drug development. The current scoring systems for grading the disease activity and staging liver fibrosis have suboptimal reliability, especially for inclusion and evaluation of clinical trial results. Using supervised and semi-supervised algorithms several digital approaches have been developed for digital quantitation of histological features in NASH and recent data will be reviewed in this presentation. Key advantages of digital pathology in NASH are: i) provides standardized, precise and reproducible quantitation on a linear scale; ii) avoids the inter- and intra-observer variations in the conventional pathology; iii) reveals more granularity of all NASH features and details of treatment response beyond the ability of human eye; iv) allows asking specific questions, and gaining better understanding of NASH pathogenesis and disease progression and regression.

17:00-17:30

CLOSING KEYNOTE ADDRESS:

ANANT MADABHUSHI

Donnell Institute Professor of Biomedical Engineering, Case Western Reserve University

Computational Pathology as a Companion Diagnostic: Role of AI in digital pathology for prognosticating disease outcome and treatment response"

With the advent of digital pathology, there is an opportunity to develop computerized image analysis methods to not just detect and diagnose disease from histopathology tissue sections, but to also attempt to predict risk of recurrence, predict disease aggressiveness and long term survival. At the Center for Computational Imaging and Personalized Diagnostics, our team has been developing a suite of image processing and computer vision tools, specifically designed to predict disease progression and response to therapy via the extraction and analysis of image-based "histological biomarkers" derived from digitized tissue biopsy specimens. These tools would serve as an attractive alternative to molecular based assays, which attempt to perform the same predictions. We have developed and applied these prognostic tools in the context of several different disease domains including breast, lung, oropharyngeal, prostate, ovarian cancer, and more recently on endomyocardial biopsies.

17:30-18:10

CLOSING KEYNOTE ADDRESS:

LIRON PANTANOWITZ

Professor of Pathology & Director of Anatomical Pathology, University of Michigan

Telepathology: Still the #1 Application of Digital Pathology

- Explain the clinical, operational and business-related benefits of performing telepathology
- Review the role of telepathology in the acute care setting for intra-operative consultation
- Assess the role of telepathology in the chronic care setting for second opinion teleconsultation

17:30-18:10

CLOSING KEYNOTE ADDRESS:

JASON HIPP

Senior Director, Head of Tissue Biomarkers and Digital Pathology, AstraZeneca

How digital pathology will transform drug discovery and cancer diagnosis

- Pharma is at the frontier of the convergence of pathology- AI-drug development
- Part 1: The transition of pathology to digital pathology enables new opportunities
- Part 2: A new field is being creating at the intersection of pathology-AI-drug development.

17:30-18:10

18:10	End of Day One

DAY 1 ROUNDTABLES

14:00-15:00 ROUNDTABLE SESSION:

Table 1: Implementing computational pathology tools in the works space: what will the future look like?

JAN LUKAS ROBERTUS

Consultant Histopathologist, Royal Brompton and Harefield Hospitals NHS Foundation Trust, Honorary Senior Clinical Lecturer, Imperial College, London

- The essential difference to introduction and application compared to other modalities in the lab such as immunohistochemistry and molecular and may be more in line with apps as we now see in other areas of AI development, thinking of app stores etc.,
- Information driven application development and question driven application development and the cross over from other areas of AI development.

Table 2: Outcome supervised deep learning

JOHAN LUNDIN

Professor of Medical Technology at the Department of Global Public Health, Karolonska Institutet; Research Director at the Institute for Molecular Medicine Finland (FIMM), University of Helsinki, Finland

Most current machine learning algorithms for research and diagnostic purposes are trained based on labels and annotations provided by human experts. The expert provided ground truth will always be subjective, does not allow novel discoveries and poses a grand challenge in the pursuit of more accurate and generalizable algorithms. The quest for more objective endpoints and labels is therefore as important for the success of applied AI as the algorithms themselves. This roundtable will address alternatives to expert supervised learning, such as outcome and biomarker supervised learning, with special focus on cancer diagnostics.

08:35-08:40 | Global Engage Welcome Address

08:40-09:20

KEYNOTE ADDRESS:
PAUL VAN DIEST
Professor and Head, Department of Pathology, University Medical Center Utrecht, The Netherlands
Implementation of AI: current status at UMC Utrecht

Artificial intelligence is the 7th revolution in pathology. Many successful pilot studies on AI in pathology have been published, some of which we have been part of. There is however a vast implementation gap, and at UMC Utrecht we have chosen to play a role in trying to fill this gap. We have a back archive of 12 years of digital images and have been fully digital for diagnostics for 5 years now, and have recently implemented the first home made AI algorithm into out digital workflow. In this presentation, the current status and future plans will be discussed.

09:20-10:00

KEYNOTE ADDRESS:
DAVID SNEAD
Consultant Pathologist UHCW NHS Trust and Director of PathLAKE
Digital pathology and computer assisted diagnosis – what's not to like?

Transition from glass slide reporting to digital pathology requires significant investment in equipment and staff for cellular pathology laboratories. The return on this investment can be maximised by the adoption of computer assisted diagnostic aids which are becoming increasingly available. The PathLAKE project, along with other initiatives, is at the forefront of developing artificial intelligence based solutions for pathologists. The creation, adoption and support for these tools present unique challenges and will alter the way pathologist work in the future. This review looks at some of these challenges and their likely legacy of these developments.

10:00-10:30

FILIPPO FRAGGETTA
Pathology Department Director,Cannizzaro Hospital, Catania, Italy
Digital pathology workflow: a new standard in pathology

In the last few years, many publications have been reported in the literature regarding Digital Pathology. The majority of them focus on the diagnostic performance of the WSI. Other papers report the implementation of a fully digital workflow (including how to render a primary digital histological diagnosis) in several laboratory all over the world. A huge amount of publications related to the study of the business case and clinical case are also in the literature. In this presentation, all these topics will be discussed together with the several QC (quality control) check points present along the digital workflow. The digital workflow will be presented as the new standard in pathology with all its related opportunities (sharing of cases, implementation of AI In routine).

10:30-11:00 | Morning Break / Poster Presentations / Exhibition Time

11:00-11:30

YINYIN YUAN
Team Leader, Computational Pathology & Integrated Genomics, Reader in Computational Pathology, The Institute of Cancer Research
Deciphering the immune microenvironment with spatial histology

Tumours are complex, evolving ecosystems with dynamic crosstalk among cancer and normal cells. Measuring spatial heterogeneity in the tumour microenvironment is critical for understanding the spatial context in which cancer develops and evolves. I will discuss quantitative spatial histology measures of immune response as a result of combining automated histology image ana lysis and spatial statistics. Geospatial variation in the immune microenvironment can have profound clinical implications, even in cancers with low immunogenicity, such as estrogen-receptor positive breast cancer. I will also share our recent progress on studying the geospatial complexity of tumour microenvironment in the TRACERx study of lung cancer evolution.

11:00-11:30

BETHANY WILLIAMS
Digital Pathology Fellow, Leeds Teaching Hospitals NHS Trust and the University of Leeds, UK
**Remote Digital Slide reporting: Future-proofing Pathology**

Pathology departments must rise to new staffing challenges caused by the coronavirus disease 19 pandemic and may need to work more flexibly for the foreseeable future. In light of this, many pathologists and departments are considering the merits of remote or home reporting of digital cases. While some individuals have experience of this, little work has been done to determine optimum conditions for home reporting, including technical and training considerations. In this talk, I will discuss the Royal College of Pathologists guidance produced in response to the pandemic and provide information regarding risk assessment of home reporting of digital slides. Information on screen specifications and a novel point of use quality assurance tool for assessing the suitability of home reporting screens for digital slide diagnosis will be shared.

WORKSHOP
11:00-12:00 by Paige

Paige
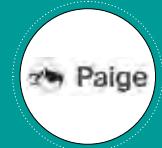
Further details on page 6

COMPUTATIONAL PATHOLOGY AND AI

MANUEL SALTO-TELLEZ
Professor of Molecular Pathology; Director of the Precision Medicine Centre; Queen's University Belfast; Professor of Integrated Pathology; Division of Molecular Pathology; The Institute of Cancer Research

Biomarker Quantitation, Multiplexing and Diagnostic applications

QuPath is arguably the most widely used open-source digital pathology tool [1], able to characterize biomarkers with high clinical significance [2, 3]. Multiplexing can be a quantitative technology apt for diagnostic application [4, 5]. Here we present the evidence and discuss the future of quantitative pathology in the diagnostic setting

11:30-12:00

JULIEN CALDERARO
Full Professor of Pathology, Henri Mondor University Hospital, Créteil, France

Artificial Intelligence-based Pathology for Biomarker Discovery

Deep learning can very effectively mine useful information from whole-slide images. Deep learning models can indeed predict survival and molecular alterations in a wide array of human cancers. Once pathology workflows are widely digitized, these approaches may be used as effective and low cost biomarkers and thus improve laboratory workflows. Validation using different staining protocols, slides format and in different centers will however be required to implement these technologies into clinical practice.

12:00-12:30

DIGITAL PATHOLOGY STRATEGY & ACADEMIC CASE STUDIES

ANTONINO CARBONE
Chairman of the Departmentof Pathology, CRO, Istituto Nazionale Tumori – Aviano

Follicular Lymphoma. Multiplex immunohistochemistry images of tumor cells and tumor microenvironment

- In the early stages of lymphomagenesis, neoplastic cells invade existing lymphoid follicles, interact with the germinal centre (GC) microenvironment and emit signals for their own survival and proliferation.
- The tumour microenvironment (TME) in FL, regardless of the involved site, includes immunocompetent lymphoid cells, stromal cells and components of the extracellular matrix. Sclerosis may be found within neoplastic follicles, although rarely. The cellular interactions in the TME are similar to normal GC B cells in the follicular microenvironment during normal immune reactions.
- This talk focuses on multiplex immunohistochemistry demonstration of the following main topics:
  1. Cellular features of the germinal centre in health and disease;
  2. Immunophenotype of follicular lymphoma;
  3. In situ follicular neoplasia.

11:00-11:30

FRIEDRICH FEUERHAKE
Attending Physician/ Associate Professor, Institute of Pathology, Medizinische Hochschule Hannover

Digital Pathology Meets Biomarker Reality: Lessons learned from Clinical Trial Support

Computational pathology holds great promise for discovery and large-scale evaluation of image-based biomarkers in biopsies. In the reality of clinical trials, common challenges for machine learning-based biomarker analyses include biological variability, technically inevitable variations in sample quality due to biopsy processing, and heterogeneous tissue composition. The presentation summarizes pragmatic strategies to overcome current limitations in clinical trial support, including innovative ways of image annotation, enrichment of training data sets by generating synthetic whole slide images, and bridging between preclinical models and clinical research. Innovative approaches are needed for successful transition of computational pathology from explorative projects and biomarker discovery into the reality of clinical biomarker research.

12:00-12:30

PHARMA/ BIOTECH TRACK

ARTHUR LEWIS
Associate Director – Digitization & AI Lead | Imaging & Data Analytics, AstraZeneca

Advanced Imaging and AI Technologies

Providing New Image and Data Analysis Challenges and Opportunities.

11:00-11:30

OLULANU AINA
Scientific Director (Pathology), Janssen Pharmaceutical Company of Johnson & Johnson

Digital Pathology Quantitative Image Analysis and Artificial Intelligence in Toxicologic Pathology and Nonclinical Safety Assessment

- Toxicologic Pathology and Nonclinical Safety Assessment are essential to drug discovery and development and critical to patient care.
- Pharmaceutical companies employ preclinical basic research and toxicology studies in animals species to determine dose, efficacy, safety, and pharmacology of investigational drugs.
- Histopathologic evaluation of tissue slides from these preclinical studies is greatly enhanced by integrating digital pathology and machine learning into the tissue evaluation workflow.

Also presented are lessons learned from digital pathology implementation at Janssen during COVID-19.

12:00-12:30

WORKSHOP
Continued

Paige
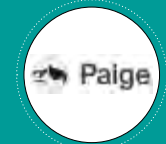
12:30-13:00

SAMI BLOM
Director of Application Development, Aiforia
Clinical Implementation of AI-assisted Diagnostics of Prostate Cancer

Artificial Intelligence (AI) is transforming clinical pathology. However, the full potential of AI can only be achieved by the seamless integration of AI in clinical workflows to support pathologists. During this talk we will present our unparalleled solutions for clinical diagnostics in prostate cancer combining powerful AI-based image analytics and integrated image viewers with reporting tools to support pathologists' decision making in the clinical workflow. A demonstration of the Aiforia Platform and its tools will be presented.

12:30-13:00

RICHARD SALMON
Business Development Lead – Life Science Technologies, FFEI
Impact of Validating and Standardising Ground-truth Colour for WSI

The ground-truth colours in pathology are real data, from real patients that require diagnostics based upon reality for accurate and reliable healthcare. By utilising colour management techniques that can validate and standardise and ground-truth coloured images in a scanner-agnostic way these life-changing decisions can be made with complete colour certainty from any WSI device. Case-studies from a diverse mixture of industry and medical applications further highlight the many advantages of applying this technology – whether you are a pathologist, pharma scientist, software developer, WSI device manufacturer or indeed a patient.

12:30-13:00

30 Minute Solution Provider Presentation
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13:00-13:30 | Lunch

13:30-14:00

SPEED NETWORKING SESSION
Please join us in the 'networking area' for this interactive session. Networking and collaboration is vital in the Digital Pathology communities. As this is a business collaboration forum we have designed this session for you to meet other attendees for a series of 3 minute speed networking video calls. If there is mutual interest – exchange virtual business cards, and arrange a more formal meeting after the session.

14:00-14:30

PEDRO OLIVEIRA
Consultant in Histopathology, Dept of Pathology, The Christie Hospital NHS Foundation Trust, Manchester, UK
Applying AIRA Matrix AI based Gleason Scoring solution to radical prostatectomy specimens

- According to the recent International Collaboration on Cancer Reporting (ICCR) guidelines, reporting radical prostatectomy (RP) specimens implies:
- An assessment by the pathologist of the Gleason patterns (primary, secondary, tertiary) as well as the Gleason sum and respective grade group
- Recommendations regarding intra-glandular tumour extension and dimension of the dominant nodule.
- Currently, this is done as an eyeball assessment by the pathologist by estimating these parameters based on a mental 3D reconstruction of the tumour areas in the prostate from multiple whole-mount or standard size glass slides.
- We will present the application of the AIRA Matrix Gleason Scoring Solution as a valuable tool to support the pathology reporting of RP specimens. We will discuss the development as well as future benefits and implications regarding MRI prostate imaging.

14:00-14:30

FLORIAN BAUMGARTNER
Senior Product Manager Visium Spatial Informatics, 10x Genomics
Bridge Digital and Molecular Pathology, Next generation profiling for enhanced molecular pathology

Dive deeper into disease pathology with 10x Genomics Visium Spatial Products, which allow you to understand your tissue sample like never before by profiling spatial gene expression alongside histological analysis of H&E stained sections to examine tissue anatomy or immunofluorescence for protein detection. Map the whole transcriptome with morphological context or focus on your genes of interest using targeted gene expression panels choose from pre-designed panels or design your own—to make novel discoveries in normal development, disease pathology, and clinical translational research.

14:00-14:15

PATRICK MYLES
CEO, Huron Digital Pathology
Lagotto – A Fundamental Shift in Computational Pathology

As the practice of pathology transitions from analog to digital, the amount of whole slide image data will increase exponentially over the next five years. Huron has developed a patented, commercial-grade image search engine for pathology called LagottoTM that represents a fundamental shift in computational pathology. As an integrated part of the digital pathology workflow, Lagotto allows pathologists, researchers, and educators to search within massive whole slide image archives and unlock the insights contained in the world's diagnostic reports and metadata. Huron Digital Pathology's CEO, Patrick Myles, will discuss Huron's LagottoTM image search platform and how it can integrate seamlessly into existing and emerging digital pathology workflows.

14:15-14:30

15 Minute Solution Provider Presentation
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JAN LUKAS ROBERTUS
Consultant Histopathologist, Royal Brompton and Harefield Hospitals NHS Foundation Trust, Honorary Senior Clinical Lecturer, Imperial College, London

The role of Artificial Intelligence in Multidisciplinary clinical decision making: Opportunities and Challenges

Every patient undergoes multiple decisions as part of their clinical pathway, involving clinicians and the application of national guidelines, in the context of a multidisciplinary team meeting (MDT). An AI-assisted clinical decision support system will capture and integrate multimodality imaging data and domain expertise from EHRs in a knowledge framework that is dynamic and flexible for situationally adaptive execution pathways and will simultaneously learn within a framework of multiple hospitals and institutes and clinical pathway guidelines, contributing to:

- Increased uniformity of decision between different institutes that deal with similar patient groups.
- Minimising uncertainty in complex non-linear disease management.
- Faster screening of a large number of patients to ensure MDTs resources will be focused.
- Bridging the inherent problems of data harmonization across healthcare systems.

14:30-15:00

No Track Talk

14:30-15:00

ALEXANDER KLIMOWICZ
Senior Principal Scientist, Immunology & Respiratory Disease Research, Boehringer-Ingelheim

Characterization of diseased human colon using multiplex immunohistochemistry and quantitative image analysis

T cell exhaustion and the PD-L1/PD-1 checkpoint axis have been extensively characterized in blood cells and human tumors. This has provided a better understanding of the role this pathway plays in tumor immunology and of its clinical utility in predicting responsiveness to checkpoint inhibitor therapies. T cell exhaustion has recently been associated with better prognosis and milder course of disease for autoimmune and autoinflammatory disorders. We have characterized and contrasted the T cell exhaustion environment between colonic inflammatory bowel disease and colorectal cancer. We applied Ultivue UltiMapper multiplex fluorescence IHC assays, combined with quantitative and spatial image analysis, to capture complex immune cell phenotypes and provide an in depth characterization of these tissues.

14:30-15:00

CLOSING KEYNOTE ADDRESS:
JOHAN LUNDIN
Professor of Medical Technology at the Department of Global Public Health, Karolonska Institutet; Research Director at the Institute for Molecular Medicine Finland (FIMM), University of Helsinki, Finland

Outcome and biomarker supervised deep learning in breast cancer for prediction of survival and efficacy of adjuvant treatment

Outcome prediction in cancer is crucial for patient stratification and for clinical decision-making related to treatment. We investigated whether a machine learning algorithm trained with images of tumour tissue morphology only, can predict breast cancer ERBB2 gene amplification status and whether this prediction is associated with adjuvant treatment efficacy and patient outcome. Our hypothesis is that training a machine learning classifier supervised by outcome and biomarkers instead of expert-defined entities has the potential to help discover new prognostic factors. Our results show that morphological features learned by the deep learning algorithm predict survival, molecular status of the tumour and efficacy of ERBB2-targeted therapy in breast cancer.

15:00-15:40

CLOSING KEYNOTE ADDRESS:
ANDREW EVANS
Chief of Pathology, Medical Director of Laboratory Medicine, Mackenzie Health

Guidelines for Validating Whole Slide Imaging for Diagnostic Purposes: What's New in 2020?

Validation of whole slide imaging (WSI) refers to the process of ensuring WSI will perform as expected for an intended use prior to its implementation for patient care. The primary purposes are to reassure all stakeholders that the diagnostic performance of pathologists using WSI will be at least equivalent to that of glass slide review while also identifying and controlling for risks WSI might introduce to patient safety. Several reasonable approaches can be taken to validate WSI systems. The College of American Pathologists (CAP) recently completed an update of their 2013 guideline. In response to the COVID-19 pandemic, the CAP also prepared a document providing pathologists with guidance on topics related to remote sign-out, includes strategies for rapid validation of WSI systems.

15:00-15:40

15:40	End of Day Two / Conference Close

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