

# Improving Immunohistochemistry

UCL Institute of Child Health, London, UK: Friday, April 24, 2009

This popular annual event, now in its 6th year, is dedicated to the technique of immunohistochemistry and in situ hybridisation.

New to this meeting will be a *troubleshooting panel session*.

On registration you will be able to submit your questions to the panel that will be asked by the chair on the day of the event

"This exciting meeting has been created to merge the need for technical-based updates in the areas of immunohistochemistry, clinical histopathology and *in situ* hybridisation. Academic speakers from each area of research will give technical presentation of 30 minute duration interspersed with 15 minute scientific contributions from commercial speakers". Meeting Chair: *Dr Will Howat*, Cambridge Research Institute, Cancer Research UK

This meeting has CPD accreditation

- 8:45 - 9:30 Registration
- 9:30 - 9:45 **Introduction by the Chair:** *Dr Will Howat*, Cambridge Research Institute, Cancer Research UK
- 9:45 - 10:15 **FISH techniques and applications**  
*Dr Paul A.W. Edwards*, Reader in Cancer Biology, Department of Pathology, University of Cambridge.  
FISH techniques will be reviewed with reference both to recent developments and to current well-established applications.
- 10:15 - 10:45 **Using Immunofluorescent-Detection Methods in the Skin**  
*Dr Carrie Ambler*, School of Biological and Biomedical Sciences, Durham university, UK  
In this seminar, I will present two primary techniques using fluorescent-labelled antibodies to detect protein expression in the skin. The first technique will be performed using traditional tissue sections, and the second on whole sheets of epidermal tissues. At the conclusion of this talk, we will discuss imaging techniques best suited for fluorescent-detection in skin tissues
- 10:45 - 11:00 **Extracting novel data from IHC staining and high resolution scanning of FISH stained TMA's (preliminary title)**  
*Mr Rob Sykes*, Applied Imaging International Ltd, Newcastle upon Tyne, UK  
This talk will explain how the Ariol imaging and image analysis platform is evolving to provide novel solutions to analysing and scanning tissues in both brightfield and fluorescent modalities.
- 11:00 - 11:10 Speakers photo
- 11:10 - 11:40 **Mid-morning break**
- 11:40 - 12:10 **Immunohistochemical Investigation of Lynch / HNPCC syndrome**  
*Dr Mark Arends*, University Reader & Hon Consultant University of Cambridge & Addenbrooke's Hospital, Cambridge, UK  
Hereditary non-polyposis colorectal cancer (HNPCC) or Lynch syndrome accounts for 2-4% of colorectal cancers and is caused by inheritance of a mutated Mismatch Repair gene, usually *MSH2* or *MLH1*, but occasionally others (e.g. *MSH6* or *PMS2*). This leads to microsatellite instability (MSI) in tumour DNA. Extra-colonic tumours may also develop such as those of endometrium, ureter, ovary, stomach, small intestine, and skin (sebaceous tumours). Suspected HNPCC cases are identified by family history and their tumours examined for abnormal MMR protein expression by immunohistochemistry for *MLH1*, *MSH2*, *MSH6* and *PMS2*, with different expression patterns for normal (homogeneously positive) and MMR abnormal (homogeneously or weakly negative) tumours.

- 12:10 - 12:25 **Patient Safety in the Pathology Environment: True Positive ID**  
*Mr Chris Rhoades, Dako UK Ltd, Cambridgeshire, UK*  
 What is the cost of a single mistake? Labs process thousands of cases a year, hundreds of cases a day. What is the cost in tracking a single mistake? Tracking a specimen throughout the entire pathology laboratory with a single point of ID has always been difficult. Multiple data entry points, multiple repeated steps with the associated multiple opportunities for transcription errors. Dako TPID could offer a solution to your specimen tracking needs. Providing a single point of accessioning and a single barcode that stays with the specimen throughout the entire process. Connecting directly to the LIS system, improving data entry and the laboratories workflow.
- 12:25 - 12:55 **Preparation and uses of frozen tissue microarrays.**  
*Miss Helen Shulver, Asterand UK*  
 This presentation will focus on the ethical, technical and quality-control aspects associated with the construction and use of frozen human tissue micro-arrays (FzTMA). Asterand have developed a routine and reliable method for the construction and validation of FzTMAs and data will be presented exemplifying tissue preservation, core morphology, antigenicity and how these arrays have been successfully used in target validation.
- 12:55 – 14:00 Lunch and poster viewing
- 14:00 – 15:00 **Troubleshooting Panel Discussion**  
 The questions that you submitted during registration will be discussed
- 15:00 - 15:15 **Non destructive quality control of HER2 control cell line sections**  
*Dr Vicky Reid, Theranostics Program Manager, Leica Microsystems, UK*  
 The field of companion diagnostics is an expanding area in which industry can make significant contributions to the quality and reliability of prognostic and predictive assays. One way to ensure such accuracy and reproducibility of HER2 testing is by using robust internal controls. We intend to present for the first time, details of a unique manufacturing process, that of interferometry, the technique of using the pattern of interference created by the superposition of 2 or more waves to diagnose the properties of section thickness in control cell line sections, to guarantee the quality and consistency of internal cell line controls that can be used in a HER2 testing assay.
- 15:15 - 15:45 **Afternoon Tea/Coffee**
- 15:45 - 16:15 **PathGrid: the application of astronomical image analysis and data access techniques to the study of histopathology data.**  
*Dr Nicholas Walton, Institute of Astronomy, The University of Cambridge*  
 We describe our pilot 'PathGrid' study which applies astronomical image processing and data handling techniques to the challenges involved in analysing Tissue Micro Array (TMA) histopathology image data. Image analysis has been applied to the input TMA data using open source solutions developed for an astronomical context. The resulting data products are in turn interfaced to the clinical trials systems in use at the Cambridge Research Institute, Cancer Research UK.
- 16:15- 16:45 **How to make a new antibody work for IHC?' And that is what most of us want, isn't it?**  
*Dr Chris van der Loos, Academic Medical Center, Amsterdam, The Netherlands*  
 Every day, newly developed antibodies are becoming commercially available. Because the majority of new antibodies are not primarily designed for IHC application, datasheets are not informative. Often lacking are relevant notes if the antibody is tested for IHC (cryo or paraffin), positive control tissue, optimal antigen retrieval method, and description of the expected IHC tissue staining pattern.  
 A number of generally applicable approaches and tools are presented for exploring the IHC staining potential of newly developed antibodies. Also, a generally applicable double staining method is discussed and suggestions are made how to make a positive/negative control block from cells.
- 16:45 - 17:00 **Chairman's summing up & close.**

## About the Chair

*Dr Will Howat* graduated with a BSC (Hons) in Immunology & Pharmacology from the University of Strathclyde, before gaining a PhD in Pathology from the University of Southampton. After two post-doctoral positions in Southampton, he moved to the Wellcome Trust Sanger Institute in Cambridge as the leader of Research & Development for the Immunohistochemistry group of the Atlas of Protein Expression project. He is now with Cancer Research UK as the head of the Histopathology/ISH facility at the Cambridge Research Institute.

## About the Speakers

*Dr Mark Arends* trained in Medicine and Pathology at the University of Edinburgh, becoming a Senior Lecturer in the University Department of Pathology and Honorary Consultant at the Royal Infirmary of Edinburgh. He moved to the University of Cambridge in 1999, where he is now a University Reader in Histopathology and Honorary Consultant at Addenbrooke's Hospital. He is lead pathologist for colorectal pathology and gynaecological pathology for Cambridge. His research includes the genomic, genetic and epigenetic mechanisms of colorectal cancer development and progression, including inherited susceptibility to colorectal carcinogenesis.

*Dr Paul Edwards* has worked on various aspects of breast cancer for thirty years. After an early involvement in monoclonal antibody production he developed methods for genetically manipulating the mouse mammary gland, and for the last decade or so has been developing FISH and array technology to study chromosome rearrangements in breast cancer.

*Rob Sykes* has worked with the Ariol Image analysis system from its release in 2003, and has been with Genetix (who acquired Applied Imaging at the end of 2006) for nearly 10 years. His scientific background is in experimental pathology and cancer research.

*Dr Vicky Reid* joined Novocastra Laboratories in 2002, just prior to their acquisition by the Australian company Vision BioSystems. In 2006, Vision was purchased by the Danaher Corporation and subsequently joined forces with Leica Microsystems to form new division within the Leica, the BioSystems Division. During her time with Leica BioSystems, Vicky has worked as a senior molecular biologist, generating recombinant antigens and in situ hybridisation reagents. More recently, Vicky has been working as the Theranostics Program Manager, focusing largely on the development of a fully automated Her2 IHC product. Vicky gained her PhD from Hull University in 2000, studying molecular genetics in contemporary populations and resting egg banks of zooplankton.

*Dr Carrie Ambler* received her doctoral training from the University of North Carolina at Chapel Hill in vascular development. At a post-doc she joined the lab of Fiona Watt at Cancer Research UK from 2003 to 2007 before starting her own laboratory at Durham University. Carrie Ambler's research both past and present focuses on the development, maintenance, and differentiation of epithelial stem cells both during embryonic skin development and in adult skin homeostasis.

*Chris Rhoades* has worked for Dako for the last 8 years, the last 3 have been as a Business Manager. Before this time he worked for the NHS as an Immunologist at a London Hospital.

*Dr Nicholas Walton* has a PhD in Astrophysics from Imperial College London. Ten years as an astronomer at the Royal Greenwich Observatory on La Palma. Moved to the Institute of Astronomy, University of Cambridge in 2001 as Project Scientist of the UK's Virtual Observatory initiative, AstroGrid. Co-winner of the 2007 Gruber Prize for Cosmology for the work with the Supernova Cosmology Project and the discovery of Dark Energy. Has worked with colleagues in Oncology and Cancer Research-UK for a number of years applying image and analysis and data handling techniques from astronomy to problems in the analysis of high volume microscopy data.

*Dr Chris van der Loos* trained as histotech and prepared a PhD thesis in 1992 as first in the AMC. Major interest in the technical issues of IHC: fixation, tissue handling, IHC detection techniques, multiple staining and spectral imaging.

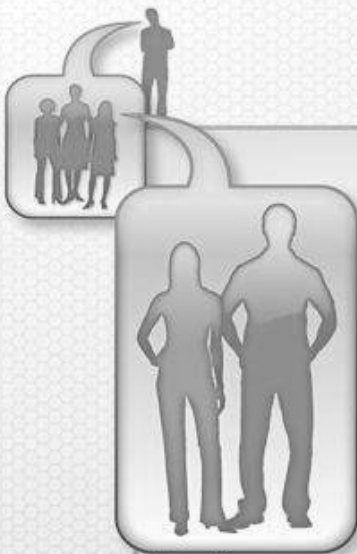
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*This meeting was **organised by Euroscicon** ([www.euroscicon.com](http://www.euroscicon.com)), a team of dedicated professionals working for the continuous improvement of technical knowledge transfer to all scientists. Euroscicon believe that they can make a positive difference to the quality of science by providing cutting edge information on new technological advancements to the scientific community. This is provided via our exceptional services to individual scientists, research institutions and industry.*

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