

# Improving Immunohistochemistry - 2010

UCL Institute of Child Health, Friday, 30 April 2010

This popular annual event, now in its 7th year, is dedicated to the technique of immunohistochemistry and in situ hybridisation.

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. With a mixed array of speakers, this meeting should appeal to clinical, academic and pharmaceutical organisations

This event has CPD accreditation and will have 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

Meeting Chair: *Dr Will Howat*, Cambridge Research Institute, Cancer Research UK

- 9:00 – 9:45      **Registration**
- 9:45 – 10:00    **Introduction by the Chair:** *Dr Will Howat*, Cambridge Research Institute, Cancer Research UK
- 10:00 – 10:30   **The developments in CTC detection, from IHC on slides through to the Ikonysis**  
*Dr George V. Thomas*, Institute of Cancer Research and Royal Marsden Hospital, Surrey, UK
- 10:30 - 10:45   **Talk to be confirmed**  
Speaker to be confirmed, Leica Microsystems (UK) Ltd
- 10:45 – 11:15   **Immunohistochemistry of Breast Biomarkers: Are we any closer to standardisation?**  
*Dr. Merdol Ibrahim*, Manager UK NEQAS-ICC, University College London (UCL), London  
Breast cancer diagnosis routinely employs immunocytochemistry for the classification and subsequent selection of patients for specific therapies. However, correct interpretation is dependent on the quality of the immunohistochemical staining, which can vary enormously between laboratories, and even show day-to-day variation within the same laboratory. External quality assessments (EOA) of breast biomarkers, including; HER2, oestrogen and progesterone receptors, will be used to illustrate acceptable and unacceptable levels of staining as affected by the choice of antibody, retrieval methods, and inhouse tissue controls. Furthermore, 'real-world' clinical data will be illustrated, as collected by a web based breast biomarker auditing system.
- 11:15 - 11:45   **Speakers photo and then Mid-morning break**
- 11:45 – 12:15   **Tissue Crossreactivity**  
*Dr Andy Postoyalko*, Covance Laboratories Ltd, Europe
- 12:15 – 12:30   **GLP tissue cross reactivity**  
*Dr Julia Stevens*, Asterand plc, Michigan, USA
- 12:30 – 12:45   **Quantitating multiple proteins in tissue sections: imaging and analysis**  
*Dr James R. Mansfield*, Cambridge Research & Instrumentation, Inc, USA
- 12:45 - 13:45   **Lunch**
- 13:45 – 14: 45   **Question and Answer Session**  
Delegates will be asked to submit questions to a panel of experts. Questions can be submitted before the event or on the day
- 14: 45 – 15:15   **Laser capture microdissection and analysis of gene expression**  
*Professor Stephen Bustin*, Professor of Molecular Science, Barts and the London School of Medicine and Dentistry, London  
Accurate description of gene expression in complex tissues requires accurate delineation of the starting material. Laser capture microdissection (LCM) is a powerful technique that permits the isolation and subsequent analysis of

single cells, or groups of related cells. Both fresh and archival material can be analysed, with both types of sample characterised by certain advantages and drawbacks. LCM in combination with real-time RT-PCR (RT-qPCR) is an effective replacement for in-situ hybridisation. As the importance of positional effects of cells within tissue, and of mRNA within cells becomes increasingly understood, it is clear that a combination of LCM, RT-qPCR and immunohistochemistry is essential for a complete description of gene expression.

15:15– 15:45 **Afternoon Tea/Coffee**

15:45 – 16:00 **Talk to be confirmed**  
*Dr Rupert Ecker, TissueGnostics, Austria*

16:00 – 16:30 **Use of automated image analysis for large-scale tissue microarray datasets: Experiences from BCAC**  
*Dr Will Howat, Cambridge Research Institute, Cancer Research UK*  
The Breast Cancer Association Consortium (BCAC) is a multi-centre collaboration of investigators interested in the inherited risk of breast cancer. Comprising over 50 individual groups, it is an invaluable resource tool. We have examined 16,000 cores from about 9,700 breast cancer tumours from participants in 10 separate studies in BCAC for 5 IHC markers, ER, PR, HER2, EGFR and CK5/6. Due to the volume of the dataset, automated image analysis with the Ariol System was used as a first pass tool for the IHC scoring followed by individual validation by pathologist. This presentation will detail the advantages and disadvantages of using this methodology.

16:30 – 16:45 **Talk to be confirmed**  
Speaker to be confirmed, Aperio, USA

16:45 – 17:15 **Creation of a human protein atlas and the search for interesting proteins**  
*Dr Caroline Kampf, Rudbeck Laboratory, Sweden*  
**Background.** Completion of the human genome sequence has opened up a possibility for global expression profiling of human tissues and cells, allowing for comparative studies between normal and disease tissues.  
**Methods.** Recombinant protein fragments selected from unique regions called Protein Epitope Signatures Tags (PrESTs) were used as immunogens to generate antibodies. Analysis of protein expression patterns was performed on tissue and cell microarrays containing >700 spots of normal and cancer tissues as well as in vitro cultured cells.  
**Results.** We have used this strategy to construct a comprehensive, antibody-based protein atlas for expression and localization profiles in 48 normal human tissues and 20 different cancers ([www.proteinatlas.org](http://www.proteinatlas.org)). The results are presented in a publicly available database containing images and data from protein profiling using over 6,000 antibodies. Each image has been manually annotated and curated by a certified pathologist to provide a knowledge base for functional studies and to allow searches and queries about protein profiles in normal and disease tissue.  
**Conclusions.** Our results suggest that it should be possible to extend this analysis to a majority of all human proteins thus providing a valuable tool for medical and biological research. We believe that the presented approach combining immunohistochemistry and tissue microarray technology can be used as an effective strategy to identify and evaluate novel markers, with potential clinical importance, of cell lineages and tumors.

17:15 **Chairman's summing up.**

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**Facebook** - <http://www.facebook.com/group.php?gid=70847076549>

**Twitter** - <http://twitter.com/Euroscicon/>

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 the Histopathology/ISH facility at the Cambridge Research Institute

### About the Speakers

**Dr Kampf** obtained her Ph.D. in Cell Biology 2001. Dr Kampf is the site-director at the Uppsala site in the Human proteome resource project (HPR) responsible for overall organisation and personnel. The HPR project is set to generate antibodies towards the entire human proteome, and to use the antibodies for expression analysis in situ in a multitude of human tissues and cells. Dr Kampf has been responsible for setting up most of the techniques and modules at the Uppsala-HPR site including the tissue micro array facility, the digitalisation unit and the validation and annotation of the immunohistochemically stained tissues.

**Professor Stephen Bustin** obtained his PhD in molecular genetics from Trinity College Dublin. He is Professor of Molecular Science at Barts and the London School of Medicine and Dentistry and visiting Professor of Molecular Biology at the University of Middlesex. His area of research is focused on the large bowel, with particular emphasis on colorectal cancer. He also has a special interest in real-time PCR and has written and edited two books on this subject. He coordinated the recent Minimum Information for Publication of Quantitative Real-Time PCR Experiments (MIQE) initiative and is regularly invited as speaker at international meetings and courses.

**Dr Merdol** was appointed the manager of the UK NEQAS ICC & ISH in 2004, where he oversees the quality of clinical immunocytochemistry produced in 600 clinical laboratories, from 54 countries. Obtained his PhD from the University of London and concentrated on immunohistochemical and morphological analysis of CNS myelination. 1997-2001 worked in Switzerland, initially within the department of Histology in Fribourg then with Novartis Pharma (Basel), within the department of Toxicopathology. 2001-2004. Research scientist at the institute of Psychiatry (London), studying mechanisms of brain plasticity

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