

Advanced electron microscopy for infectious disease control and clinical diagnostics

9th February 2023 | 12:00 – 13:30 (GMT)



Chair: Dr. Ibolya E Kepiro *National Physical Laboratory, UK*

Challenges in healthcare and the route towards standardization

A challenge is to provide reproducible and quantitative measurements across different laboratories in experimental scientific work. This is critical in diagnostics and the pharmaceutical industry when consistent results are required in validation of procedures. We will show case studies in electron microscopy diagnostics with complementary imaging techniques characterizing samples from biopsy. During the webinar we will discuss working models and recent advances in standardization when reference materials are used to aid traceability in measurements as examples to implement in preclinical research and development.



The importance of standardization in laboratory medicine

Prof. Ian Young *Clinical professor, Queen's University, Belfast, UK and JCTLM*

Laboratory Medicine plays a central role in clinical decision making, guiding up to 70% of significant clinical decisions. In particular, biomarker derived clinical decision limits may be important in determining prognosis, making a diagnosis, and monitoring response to treatment in a range of settings. In this context, clinicians and patients expect laboratory results to be comparable across different laboratories, and consistent in relation to both time and place. While this has been achieved internationally for some analytes, for others significant between method differences persist which may lead to poor and inconsistent clinical decision making.

A range of international organisations collaborate to prioritize measurands for standardization and to promote standardization internationally, including the Joint Committee for Traceability in Laboratory Medicine (JCTLM), National Metrology Institutes, the International Consortium for the Harmonization of Clinical Laboratory Results (ICHCLR), and the International Federation for Clinical Chemistry and Laboratory Medicine (IFCC). Achieving measurement accuracy more widely will contribute to consistent decisions by clinicians, consistent decisions for patients, equitable implementation for policy makers, value for money for funders and easier adoption of emerging evidence and best practice.



Primary membranous glomerulonephritis (MGN) diagnosis in renal biopsies using correlative light and electron microscopy (CLEM)

Prof. Murray C Killingworth, YF Ng and T Cohen-Hyams

Correlative Microscopy and Nanopathology, NSW Health Pathology, Australia

The presence of PLA2R in glomerular deposits is assessed as part of the criteria used to establish a diagnosis of primary versus secondary membranous glomerulonephritis (MGN). This is usually done with immunohistochemistry and electron microscopy using two separate samples. A CLEM approach derives the same information from a single sample and provides enhanced information on the pathogenesis of MGN.



Clinical Pathology case studies using advanced imaging

Dr Patricia Goggin *Head of Biomedical imaging Unit, University Hospital Southampton, UK*

The Biomedical Imaging Unit is a joint NHS and University facility for light, X-ray and electron imaging. Our clinical samples include renal, neuro and respiratory samples for the diagnosis of Primary Ciliary Dyskinesia (PCD). I will cover some recent cases where the application of non-traditional TEM has been useful. These will include the use of TEM tomography to diagnose PCD, the application of SEM to foreign body identification and the use of X-ray computed tomography in lung granulomas.