

Diagnostic Renal Pathology in Rural & Remote Australia - the Compelling Need for a Cost-Effective Desktop Electron Microscope

M.C. Killingsworth^{1,2,3,4}, T. Cohen Hyams^{2,4}

¹ NSW Health Pathology; ² Ingham Institute for Applied Medical Research; ³ University of NSW (Sydney); ⁴ Western Sydney university.

Abstract

Rural and remote regions of Australia have unacceptably high levels of chronic kidney disease (1), with the health system projected to be facing a catastrophic burden (2) unless there is improved access to early detection, intervention and access to transplantation. The current service model is hampered by geographic access to regional centres where a biopsy can be performed and, in many cases, there is a lack of locally based renal nephrologists which is often filled by remote-based primary carers (3). To complicate things further, diagnostic infrastructure is focused in metropolitan centres such as Sydney and Melbourne with, for example in NSW, no transmission electron microscope (TEM) located west of the Blue Mountains. Since 2018, a collaboration between the Ingham Institute for Applied Medical Research, NSW Health Pathology, university and commercial partners ATA Scientific and Thermo Fisher Scientific International has led to the development of a low kV desktop electron microscope capable of producing TEM-like images of soft tissue samples at similar magnifications and resolution to a conventional 80 kV microscope. This imaging can be achieved without the requirement of a complex laboratory environment and does not require highly trained operators. It is proposed that formal validation of this technology and implementation of these instruments could enhance local capacity building in renal diagnostic pathology and enable a new model of service delivery to rural and remote regions based on a digital "hub and spoke" model with data sharing between the regions and metropolitan reference centres.

References

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