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Strategies for implementation of digital pathology as a primary diagnostic tool

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In the UK, the importance of innovation in pathology is recognized in a recent NHS England report (Digital First: Clinical transformation through pathology innovation). Digital Pathology (DP) is such an innovation with a potential to transform the delivery of diagnostic histopathology services. At the end of 2015, the DP market was valued at US$327 Million, with a significant increase in market value forecast. However, whilst there have been significant increases in market value along with advances in DP, primary diagnostic use of this technology in the UK is not widespread. Internationally, there are several examples of digital pathology (DP) utilization in Africa; North, South and Central America; Mexico; Asia (Japan, India) and Europe. The main drive for implementation of DP in some countries is the unmet need of the population for quality diagnostic services and appropriately trained staff. This talk will describe the diagnostic histopathology landscape in the UK and discuss strategies that may be adopted to improve the uptake of this technology as a primary diagnostic tool. This will include our own work, in partnership with Philips Digital Pathology Solutions to improve DP training and awareness. Examples of diagnostic DP implementation will be reviewed in order to assess how such examples can inform strategies to improve adoption of DP in the UK.

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An automated method to compute bone marrow density and M:E ratios from H&E slides

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Bone marrow toxicity is an important safety signal in a large variety of pre-clinical drug development programs. Currently, bone marrow cellularity is assessed semi-quantitatively by manual examination of H&E slides by a pathologist. Changes in M:E (Myeloid:Erythroid) cell ratios are challenging to estimate manually from H&E slides. For more accurate assessment, it is necessary to perform a manual differential cell count on bone marrow cytology smears. Both manual procedures are time and resource-intensive. A more efficient quantification process would provide a means to rapidly screen a larger number of slides from studies which exhibited and/or anticipated bone marrow toxicity. An entirely automated image analysis program was designed using Definiens Developer which quantifies changes in overall bone marrow cellularity and approximates M:E ratios and megakaryocyte density in H&E slides. Preliminary validation studies in rats indicate that the automated results correlate well with manual assessment.

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