RMS Microscope Quality control Focussed Interest Group (FIG) summary of discussions

Tuesday 2nd July 2019 4-5:30pm Microscience 2019 Manchester Conference Centre

Question / statement / point raised	Comments/ discussion
QC information & metadata	
Unable or potentially too much information to embed QC data into metadata.	Easily obtainable QC information that can be recorded by the acquisition software at the point of initialising the system we feel should be included and will not be too sizeable. We acknowledge that more complicated QC measurements which will involve data processing cannot be included in simple image metadata.
Little relevance only applicable to the system that the data was captured on.	True but the information can be used to track system performance over the period of the study (if required).
What data to collect?	Good question – the community are discussing this with a view to prioritise tasks and recommend samples and methods.
Confocal- embedding Laser power measurement into metadata.	General consensus that this information would be beneficial. Many confocal system scan heads are already set up to measure laser power.
What variation in the measured QC parameter will be acceptable before requesting a microscope service / repair?	Good point, one for the community to discuss with manufacturer input. Is variation due to the 'standard sample' or system performance?
What QC data is relevant and where should efforts be concentrated?	
How will the QC data be used?	Microscope manufacturers are concerned that QC data will be used as a tool to make absolute intra- and inter- system comparisons across the community. We feel that the primary aim of collecting QC data will be to monitor system performance over time and benchmark it against a known standard (point of installation for example)
Solution / QC measurements should be a balance between effort (time, cost) and completeness	Absolutely, priority should be given to those QC tasks that have the most impact on system performance and are easier to record and evaluate. There is the issue of sample cost…
What aspect of a microscope system drifts out of specification the most and has the most impact on system performance?	Prioritise a list of QC checks and summarise impact on system performance if not checked.
QC samples? What is already out there?	

QC standard slides how stable are they?	Bead samples, Argolight slide, Corbett PSF-check slide, GATTAQuant? Agreement that performance of the sample should be known and should not be subject to variation.
Cost and potential monopoly by one manufacturer.	Argolight slides are expensive but may cover several QC variables on one slide. PSF-check slides (Corbett) are lower cost but long-term stability unknown. Charging model will need to be favourable for large-scale uptake
Manufacturers should provide more information relating to system performance at the point of installation. They should also describe how this is measured and what deviation either side of 'perfect' is allowed.	Can't agree more! System performance data before and after instrument servicing should also be made available by manufacturers. They should also share with the community the methods that they use to make the measurements (including samples, software tools). Eg. Zeiss calibration lens.
Manufacturers should also provide standards and QC analysis tools as part of their service contract or price of purchase	Good point, it may also make identifying microscope problems more efficient for the manufacturers
Automation	
Once a QC sample has been agreed upon covering all the minimal QC measurements, manufacturers should look to develop automated capture macros to make the collection of QC data more time-efficient	Argolight have developed a macro with their HM slide that works on Zeiss automated platforms, but this also require the user to have installed their (Zeiss') 'macro environment' which comes at a cost. Any QC solution will need to make it easier for the end user to capture QC data, by automating image capture and user bias will be removed.
Uploading and analysis of QC data should also be automated	Agreed, a suitable tool should be implemented capable of accepting output from all major manufacturers. The tool should also database the QC metric measures and allow for the end user to extract that data easily. Ideally the software should in an automated way flag up system performance changes.
Other points raised	
Develop an 'understanding your microscope' QC-focussed course / material possibly run via or through the RMS.	