Data management and automatic reporting for 3D X-ray histology

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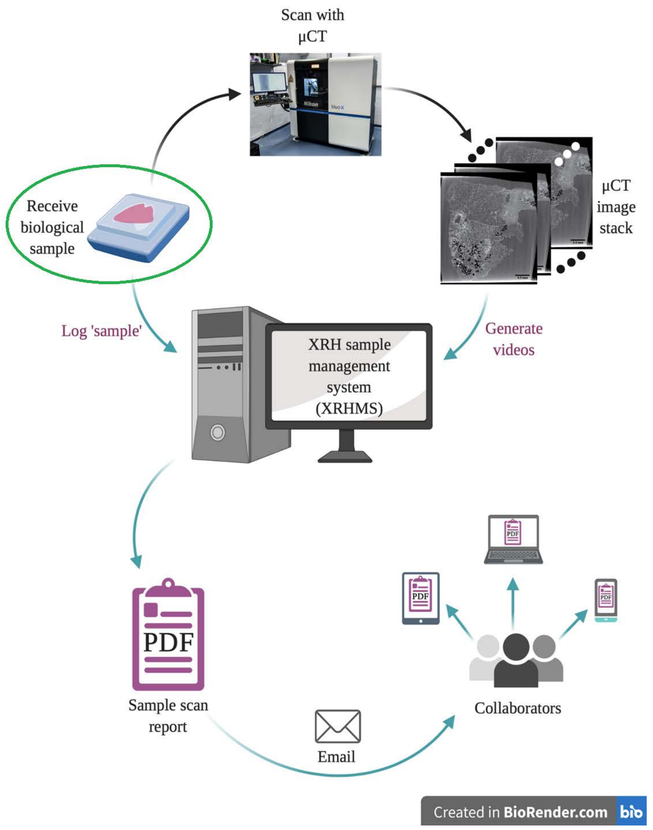


Figure 1: Summary of workflow for PDF report generation using the custom data management system (XRHMS). The start of the process is circled in green.

3D X-ray Histology (XRH) can provide volumetric and high-resolution information of soft tissue samples revealing their microstructures. XRH scanning is non-destructive and can be inserted into existing clinical histopathology workflows for formalin-fixed paraffin embedded (FFPE) specimens, and intraoperative assessment of samples (see separate poster).

Data Management Requirements these 3D datasets can be 50 – 100GB per scan, and require specialist tools to manage and interrogate. The scans need to be linked to samples, which can be tracked as they progress from 'Fresh', to 'FFPE' to 'Stained thin sections'. Metadata needs to be automatically extracted from the scans to enable users to understand the imaging conditions used to take the scans.

X-ray Histology Management System (XRHMS) these data management requirements have been implemented in the XRHMS, a custom designed solution to manage all data and samples within the XRH lab. It includes data storage & management, data processing, metadata extraction, and sample labelling & photography solutions. All these elements come together to enable reports to be automatically generated for facility users, as well as providing full tracking of samples and data through the facility.

Report Generation To provide quick easy to understand reports the system combines metadata with scan images, and previously stored photos to produce easy to email PDF reports. These PDF can contain links to videos showing the full 3D data set, and example report is shown in Figure 2. The full process of sample being received through to PDF report is shown in Figure 1.

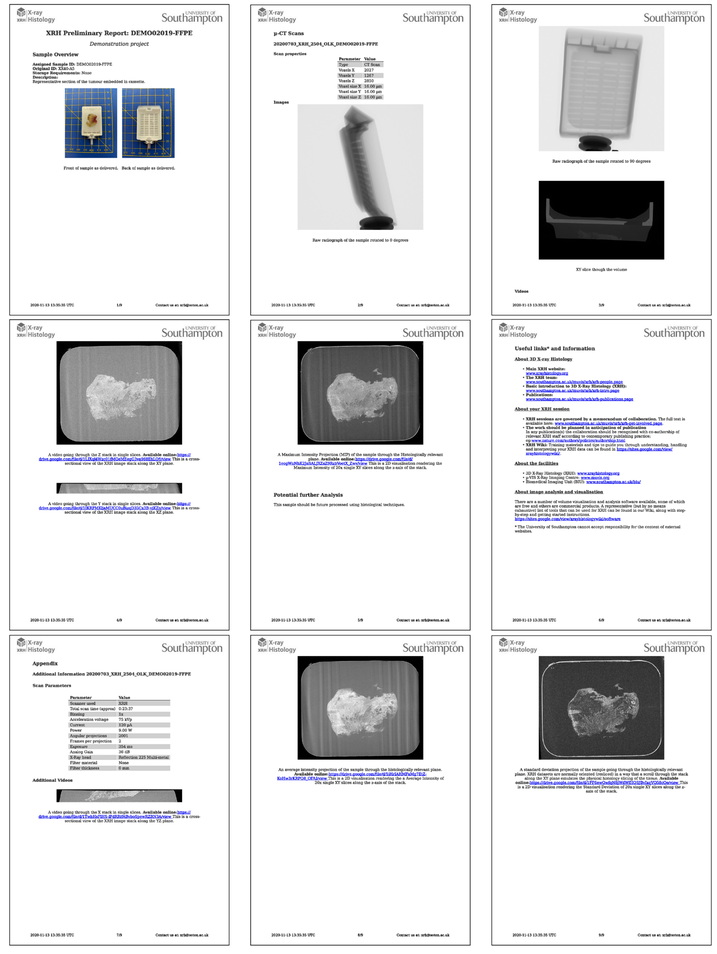
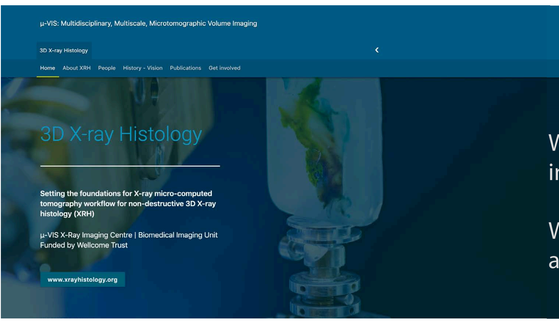


Figure 2: Example PDF report, click image to open full PDF version.



Get involved, get in touch with the XRH-team!

We are always **looking for collaborations** to explore the full potential of the technology, and **can provide open access to the technique for *proof-of-concept* studies** with qualitative inspection and quantitative image-based characterisation of the tissue.

We are particularly interested in stimulating and supporting novel and exploratory projects, introducing 3D X-ray Histology to the wider biomedical research and clinical pathology community and identifying application-specific imaging needs.

X-ray Histology www.xrayhistology.org

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