Contribution ID: **104** Type: **Poster**

Formalin-fixed paraffin embedded animal tissue spatial elementomics using synchrotron X-ray fluorescence

Thursday, July 13, 2023 3:30 PM (1 hour)

Spatial evaluations are powerful tools in understanding function of structures within complex tissues. Distribution of elements within animal tissues are not commonly performed using X-ray fluorescence and represents an opportunity for expansion. Animal tissues are commonly preserved in formalin-fixed paraffin embedded (FFPE) blocks and large libraries of normal and diseases tissues are available. The FMB beamline at the Cornell High Energy Synchrotron Source measured XRF spatial maps of FFPE bovine ovaries using a 10 keV microbeam (3 x 13 μm2) to evaluate distribution of micronutrients such as calcium, zinc, and iron in different ovarian structures. We found that calcium is enriched in the cortical region of the bovine ovary. The cortex is the layer closest to the ovarian surface typically between 1 and 2 mm in thickness and is also the area where the ovarian oocyte reserves are located. Since the bovine ovary was previously fixed in formalin before being embedded in paraffin, it is possible that there was some interaction between the cortex and the formalin that occurred during the fixation process. To rule out formalin fixation as a cause for the calcium enrichment in the cortex, fresh bovine ovary sections (unfixed) was imaged using the same setup and a similar distribution of calcium enrichment at the cortex layer was observed. Enrichment of calcium in the cortex region of the ovary has not been described and further validation is required. FFPE specimen libraries could be good candidates for confocal XRF mapping to improve the lateral spatial resolution and reduce noise from surface contamination. Other possible use of synchrotron X-ray fluorescence in FFPE sections for agriculture includes studying the distribution of toxic metals in brain and placental tissues of agricultural animals.

Primary authors: CHEONG, Soon Hon (Cornell University); SMIESKA, Louisa

Presenter: CHEONG, Soon Hon (Cornell University)

Session Classification: Poster Session 2

Track Classification: Poster Session