UAB HIGH RESOLUTION IMAGING FACILITY

Knowledge that will change your world

Scanning Electron Microscopy

## Scanning Electron Microscope

FEI Quanta 650 FEG (SEM)

The SEM in the laboratory features a high-resolution field emission gun with environmental technology. It is one of the most versatile SEM instruments available. In the lab we look at everything from cancer cells to car parts.

High Vacuum

The traditional SEM method. In high vacuum mode it is possible to obtain surface images of dry, conductive samples with nanometer resolution

Image: Porous Manganese Carbonate Templates (Cover of JMC_B) Courtesy of Dr. Kharlampieva
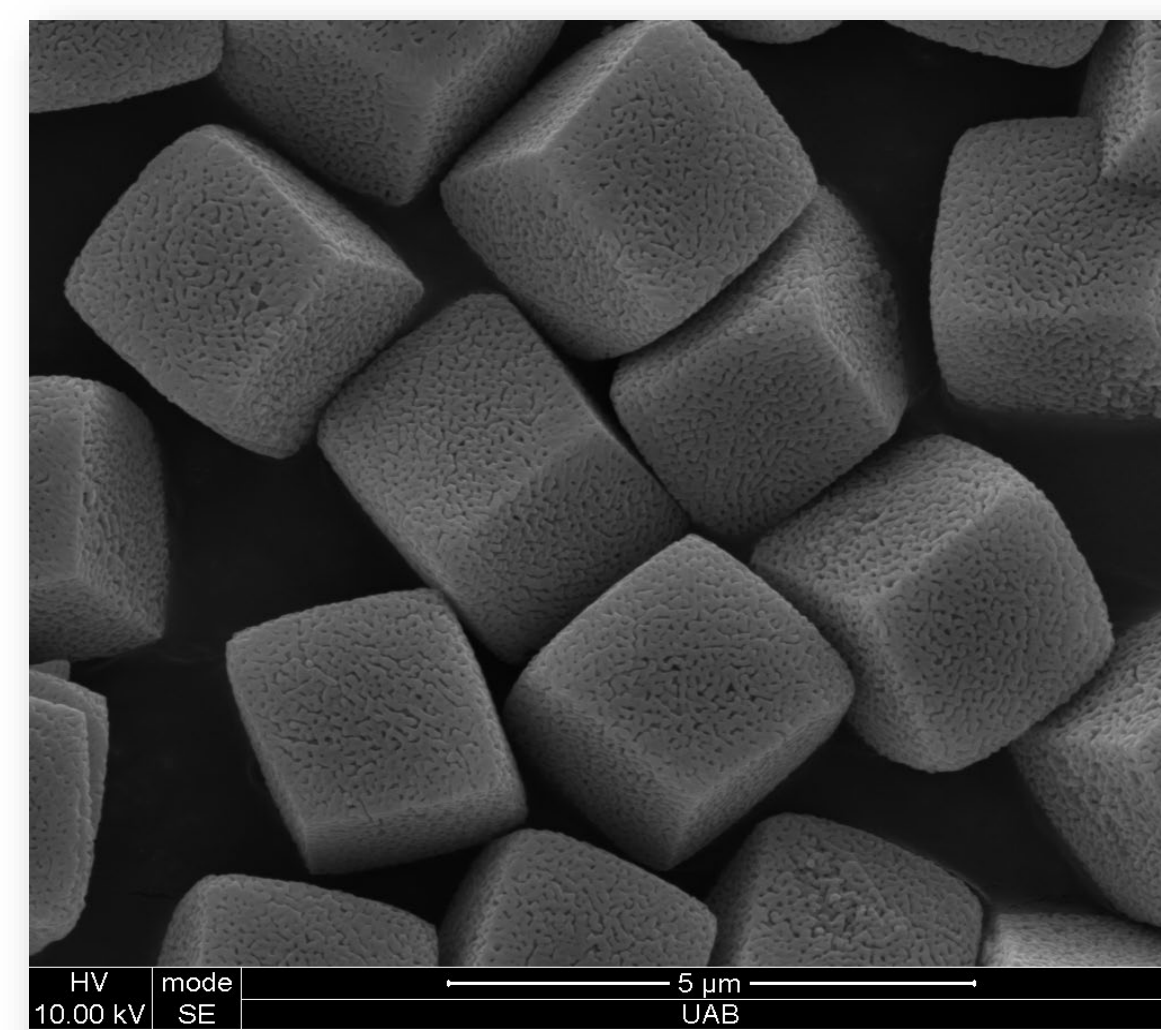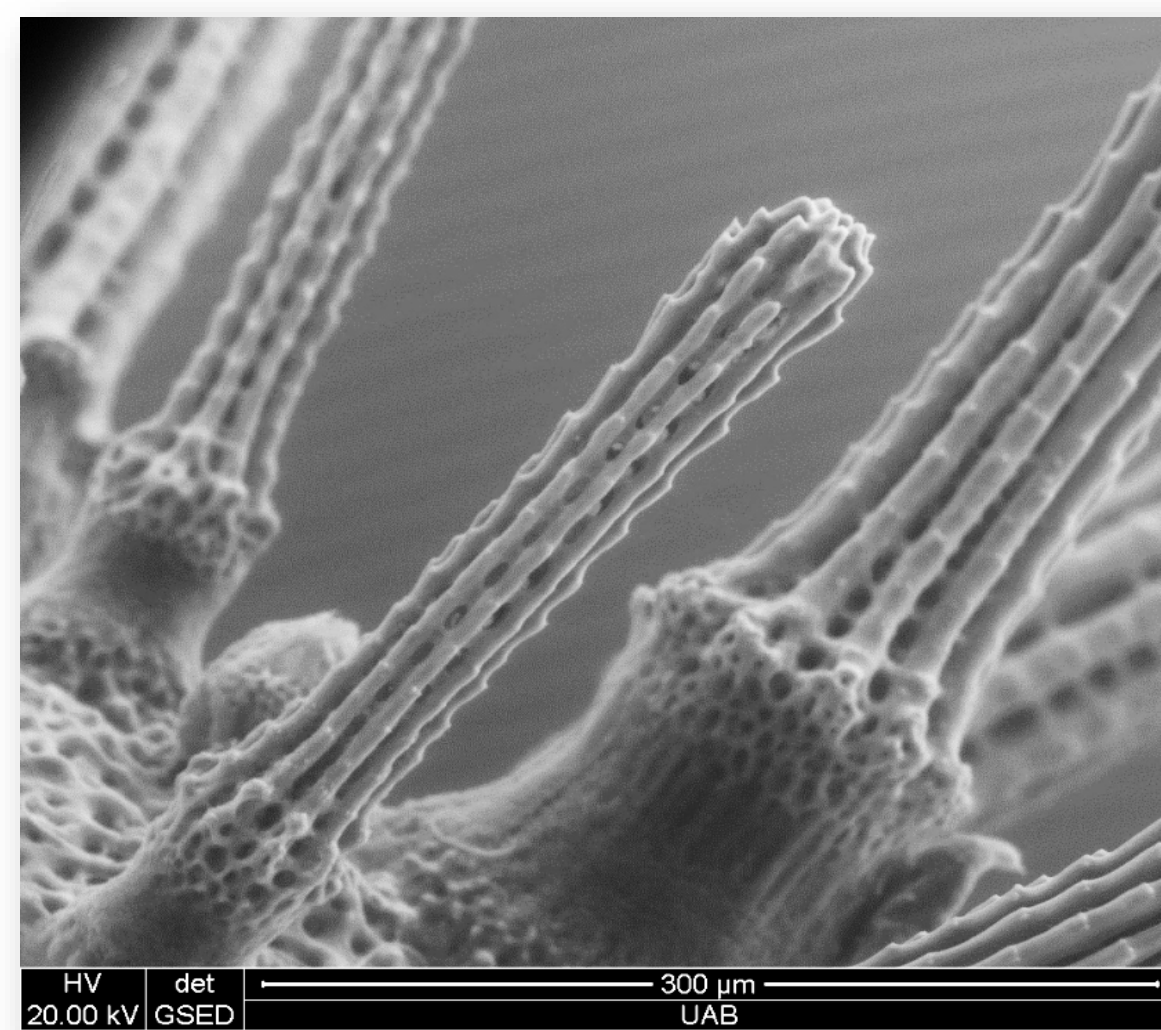
Low Vacuum

Low vacuum is a variable pressure mode, allowing for imaging of non-conductive, dry samples.

Image: Mouse Intestine

Environmental SEM (ESEM)

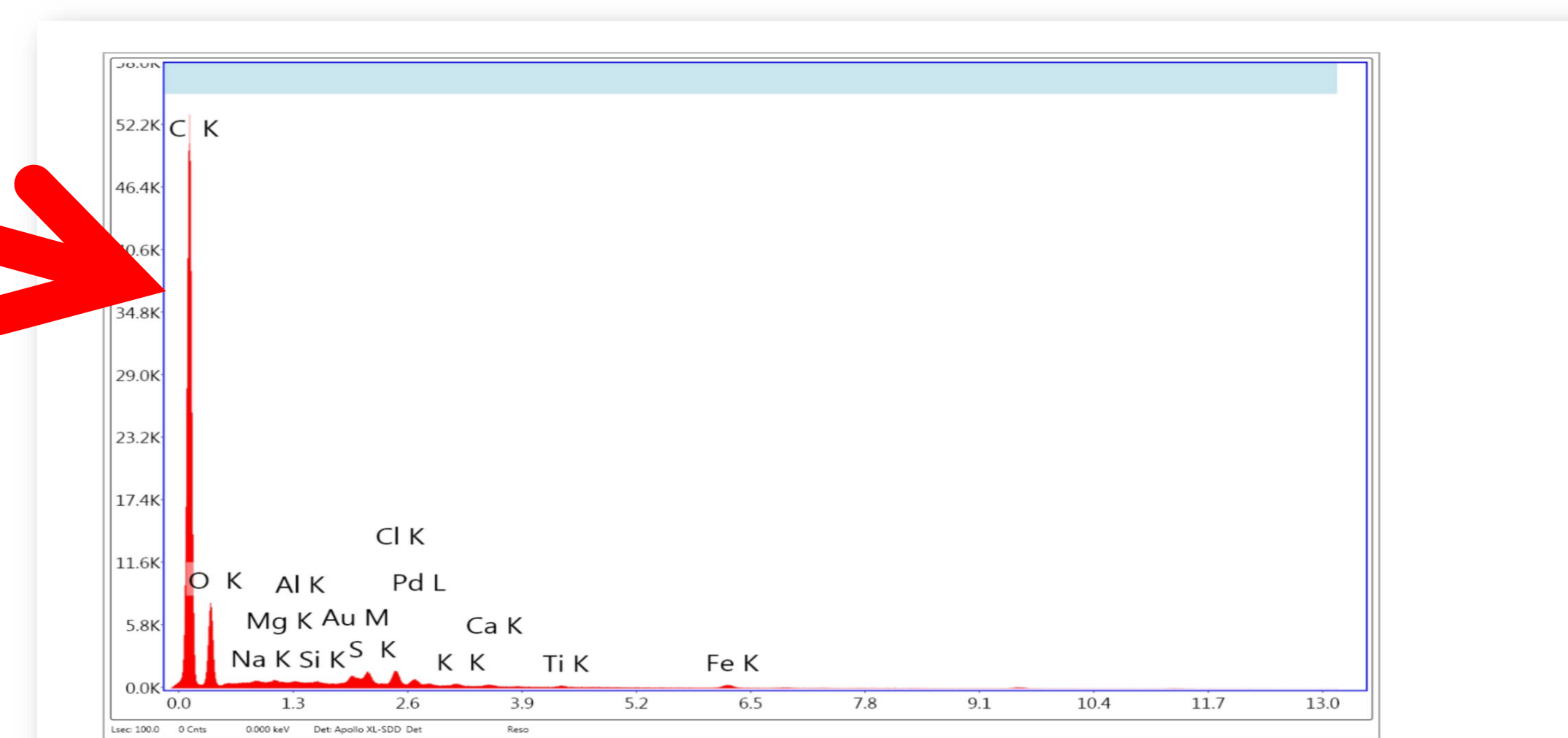ESEM is a mode which can be used to image wet, living, and unfixed samples
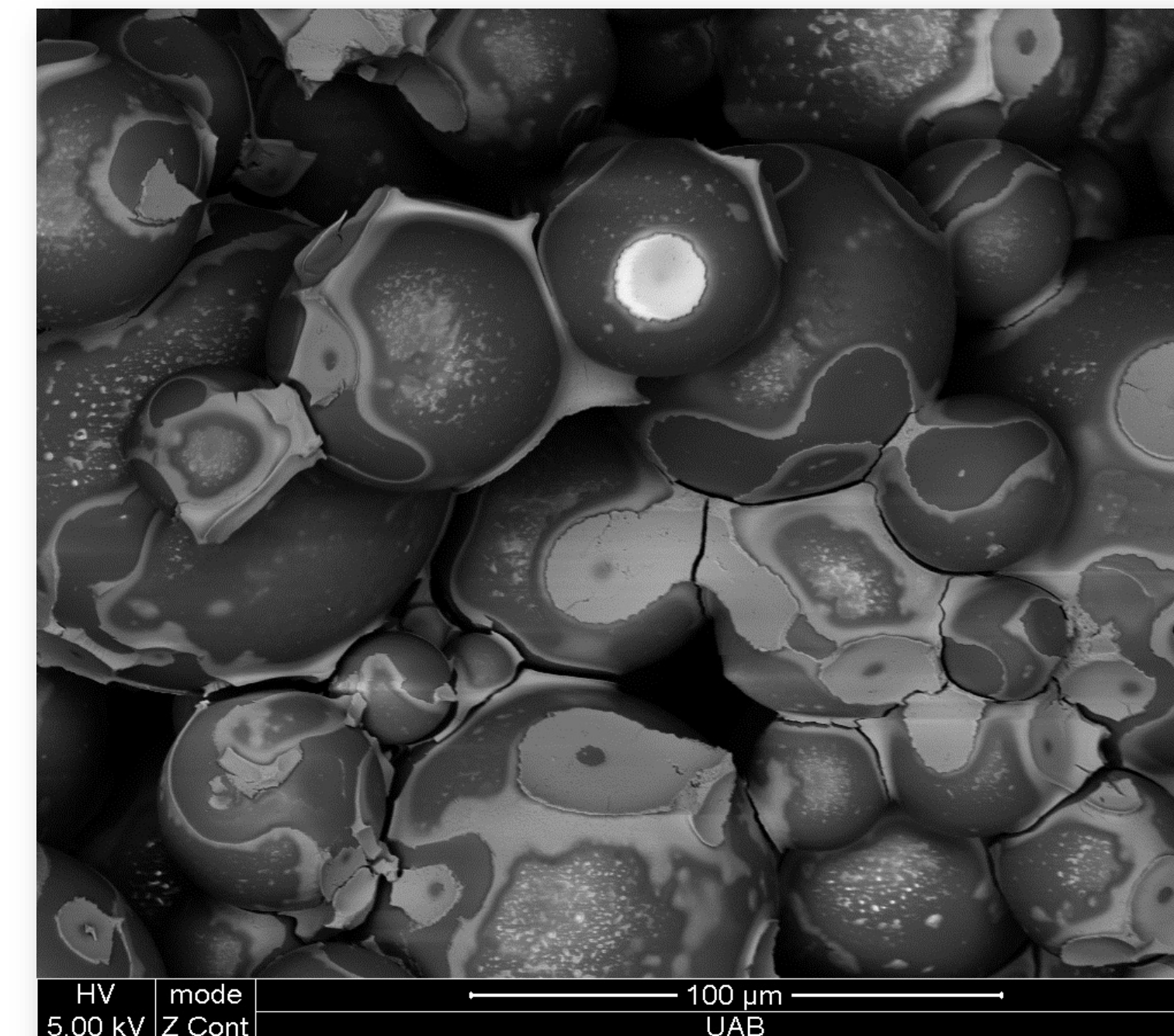
Image: Sea Urchin

Energy Dispersive Spectroscopy (EDS)

EDS provides a qualitative elemental analysis of samples. This is available for all pressure modes

Image: Pyrite

Compositional Imaging (Backscatter Electron, BSE)

In BSE mode, regions with elements of higher atomic number show higher intensity in the image

Image: Ceramic

Wet STEM

Wet scanning-transmission electron microscopy (STEM) allows high-resolution transmission imaging of biological samples in a hydrated state, with minimal sample preparation.
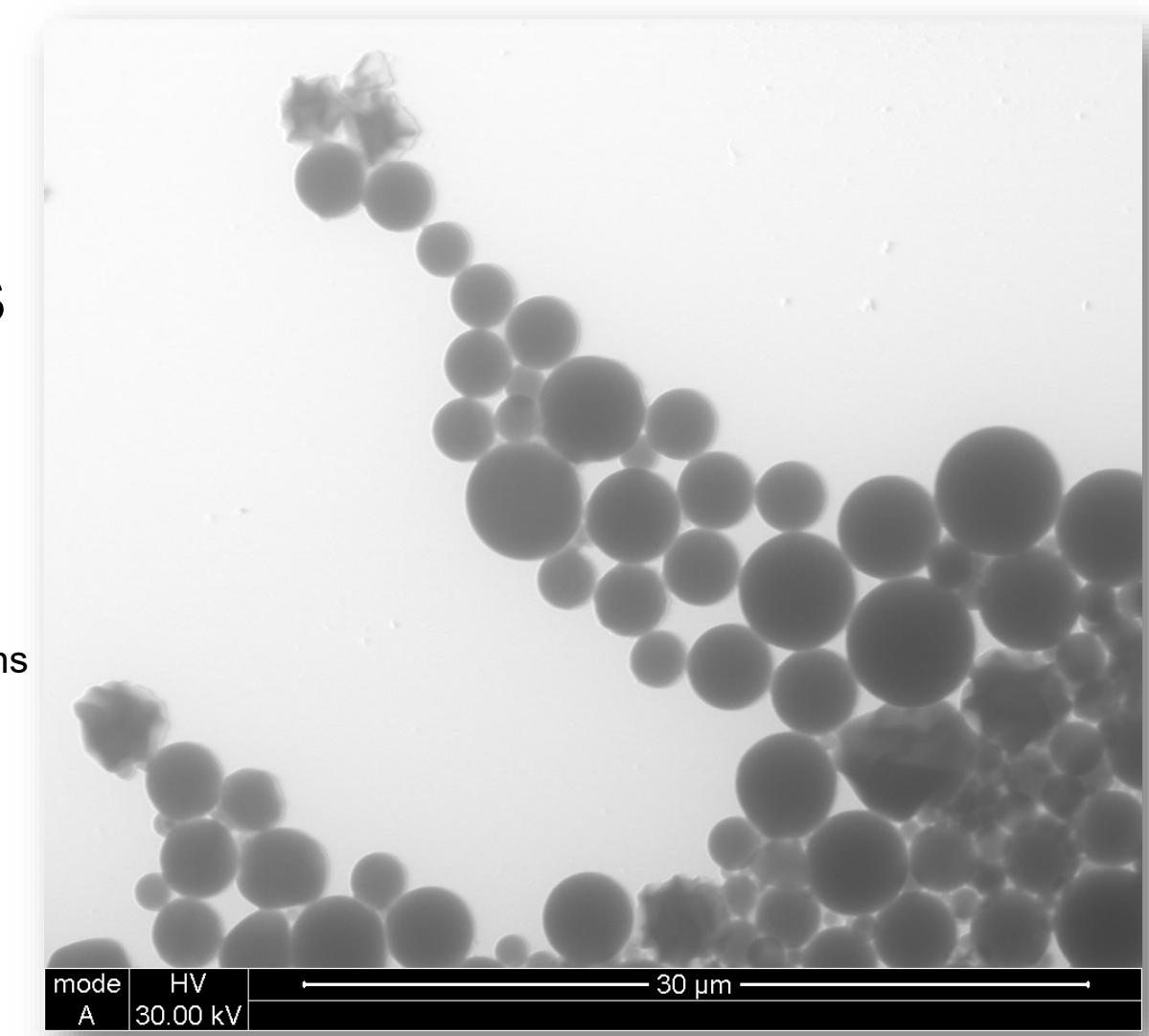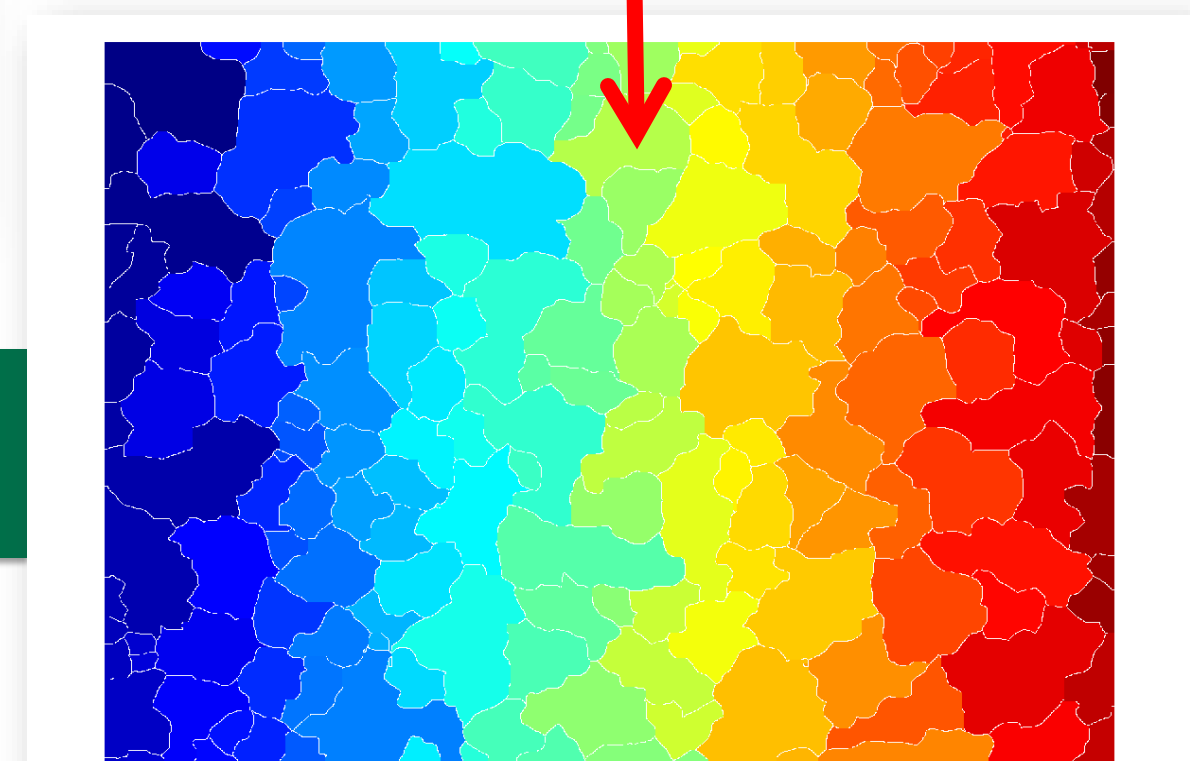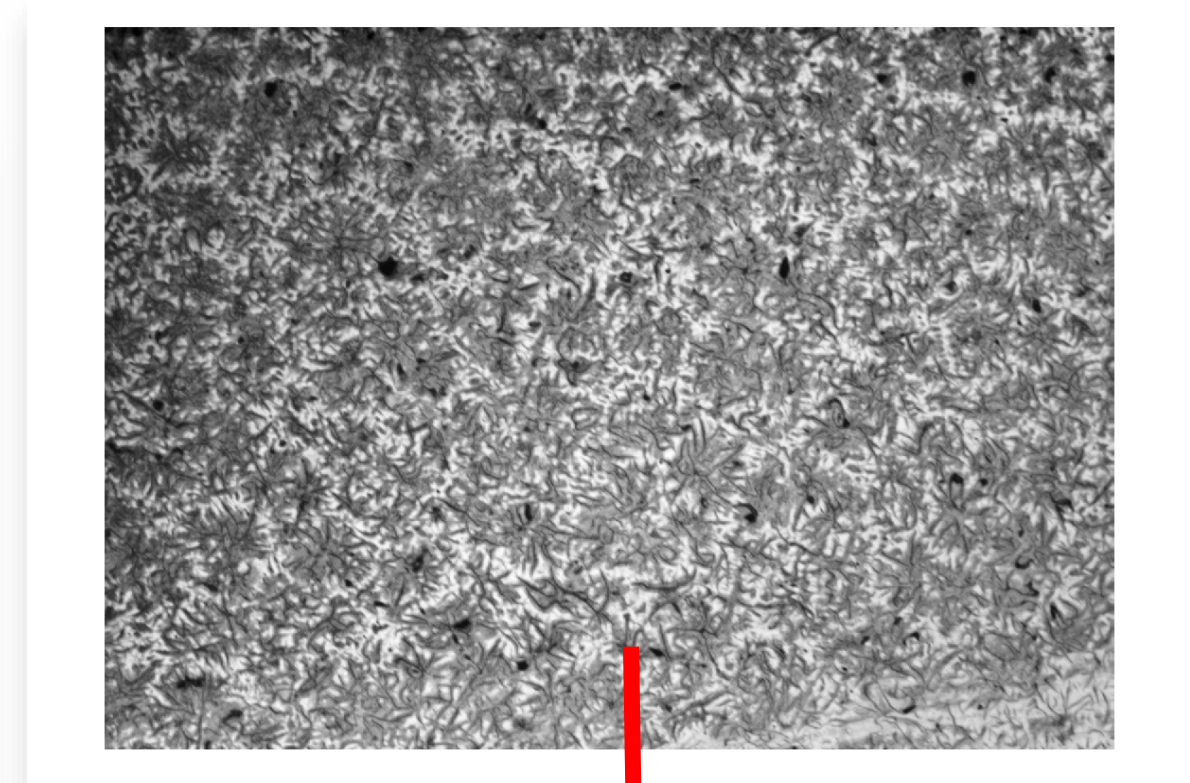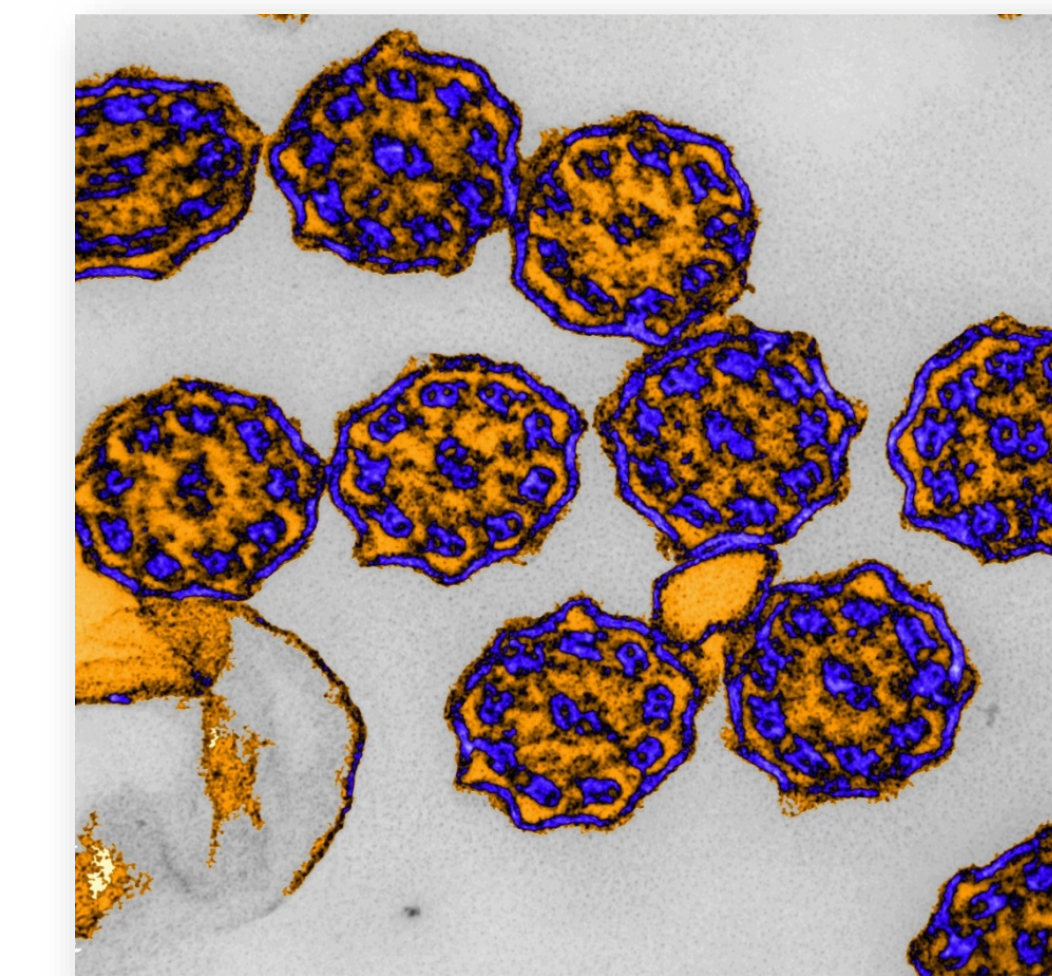
Image: PLGA Micro-balloons

Image Processing Techniques

Consult with Nik for your image processing needs.

Examples of image processing work done:
- Porosity metrics
- Cell/Grain Size
- Dendrite Arm Spacing
- Graphite Spacing
- Application specific image montages
- Various post processing algorithms for HRIF
- Colorization

Other

- Beam Deceleration
- Stereo Imaging
- Topography
- And more!

Image: Diamond on a steel substrate

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