

Differentiating AgNPs and AuNPs in a Single Cell Culture

Nanomaterials are being widely studied as drug delivery vehicles and bio-markers and are increasingly the subject of clinical trials. In some studies, distinguishing between two different materials within a single sample may be required.

The CytoViva Hyperspectral Microscope System can provide this ability to identify and map multiple nanoparticles in a single sample. In this example, AuNPs and AgNPs are identified and mapped within a single cell culture. To accomplish this, the nanoparticles are first imaged independently and spectral libraries are created for each particle type (see Figures 1 and 2).

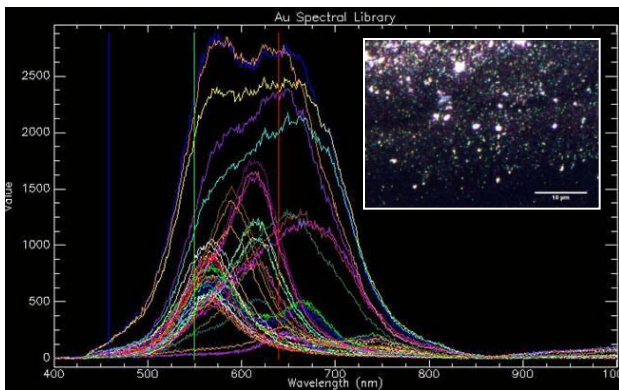


Figure 1. Hyperspectral Image and Spectral Library of AuNPs

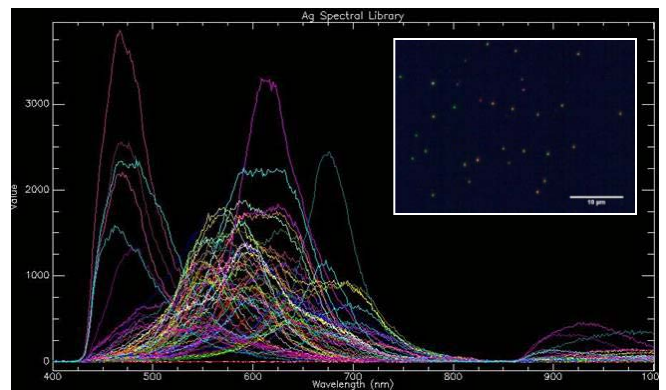


Figure 2. Hyperspectral Image and Spectral Library of AgNPs

When both particle types are included in a single sample, a hyperspectral scanned image of the sample is created. Then, using hyperspectral image analysis software, the presence and location of the different particle types are mapped based on their respective spectral libraries. Below (Figure 3) is a hyperspectral image of a cell culture containing both AuNPs and AgNPs. Figure 4 illustrates the ability to map pixels matching AuNP spectra (green) and pixels matching AgNP spectra (red).

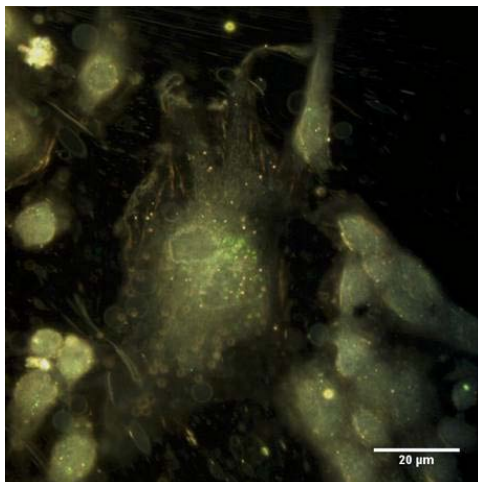


Figure 3. Hyperspectral Image of Cell Culture with AuNPs and AgNPs

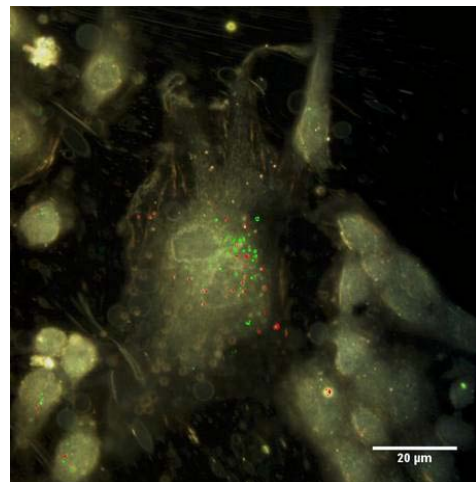


Figure 4. Mapping of AuNPs and AgNPs in Cell Culture