

Label Free Nanoparticle Imaging in Cells

CytoViva's enhanced darkfield hyperspectral microscopy enables optical observation and spectral characterization of nanoparticle samples as they interact with cells or tissue. No fluorescent labeling or other alteration of the sample is required with the CytoViva system.

Confocal fluorescence imaging and electron microscopy require either the addition of fluorescent labels or other sample alteration for observation of nanomaterials in cells and tissue. These alterations can significantly increase the complexity of the experiment and can create complicated artifacts or limit specificity. In addition, neither technique can provide for discreet sample chemistry analysis such as the detection of a drug load added to a nanoparticle.

CytoViva's enhanced darkfield hyperspectral microscopy was specifically designed to overcome these issues. With CytoViva, nanoparticle and cell-tissue sample interactions can be observed with no fluorescent labels or other sample modification. Spectral libraries can be created to spectrally characterize and locate these nanomaterials in a complex environment. Even discreet chemistry, such as a drug load or targeting protein added to the nanomaterials, can often be spectrally characterized in the sample.

In this experiment, label free gold nanoparticles (AuNPs) were incubated in an unstained cell. Figure 1 is a hyperspectral image of a cell that has been incubated with AuNPs taken with the CytoViva Hyperspectral Imaging System. With the integrated analysis features, a reference spectral library for AuNPs was created (Figure 2). The spectral library was then compared to the data found in Figure 1 to locate the AuNPs in the cell. Figure 3 is an image that illustrates spectral mapping by using to color red to denote the location of the AuNPs in the cell.

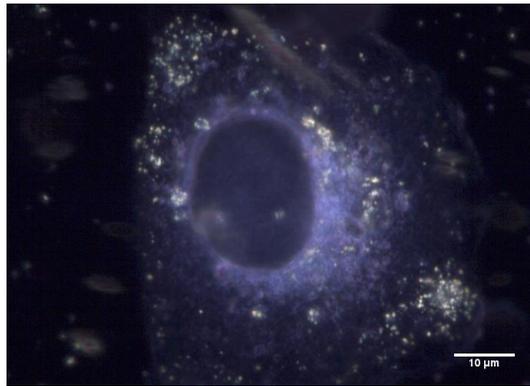


Figure 1. AuNPs Incubated in a Cell

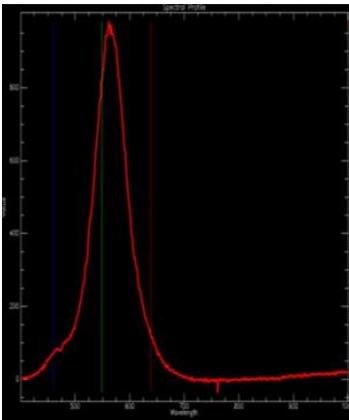


Figure 2. AuNP Spectral Library

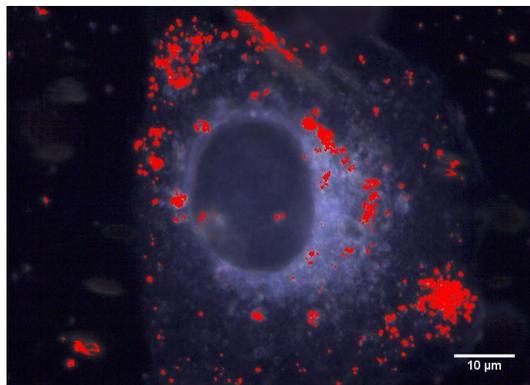


Figure 3. Red Confirms the Presence of AuNPs in Cell

To learn more about CytoViva's Enhanced Darkfield Hyperspectral Microscopy, contact us at info@cytoviva.com or 1-888-737-3130. We would be pleased to learn more about your current research and can schedule test imaging of your samples if appropriate.

More Information

To read the published paper please visit:

<http://www.biomedcentral.com/content/pdf/1743-8977-10-50.pdf>

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