

Label Free, Hyperspectral Microscopy for Materials and Biological Research

Byron J. CHEATHAM - *CytoViva, Inc*

The ability to conduct nanoscale label-free imaging can greatly enhance research across a wide range of scientific disciplines. For materials science, label free optical microscopy can provide rapid feedback on samples and lessen the dependence on the electron microscope or other more time-consuming methods. In biology related research, it can reduce or eliminate the need for immuno-fluorescence.

To meet this need, a novel hyperspectral microscope technology has been developed by CytoViva, Inc, that supports research across a wide range of research disciplines. This technology includes research-grade optical microscopy optics that operate in transmitted and reflected light mode to support both translucent and opaque sample substrates. It also includes patented enhanced darkfield optics, which enable optical imaging at the nanoscale with proven performance imaging sample elements well below 100nm.

The integration of hyperspectral imaging onto the microscope allows for the capture of high-resolution spectral images, with each image pixel containing the VNIR (400nm-1,000nm) optical spectrum of that pixel's spatial area. The pixel level spectrum allows for the rapid characterization of discrete sample elements, while powerful image analysis software allows for these elements to be mapped in the image.

This talk will provide an overview of hyperspectral microscopy principles and illustrate how it is used across a wide range of materials and biological based research initiatives.