

Simultaneous Observation of Nanoparticles and Fluorescent Labeled Cells

The ability to observe nanoparticles internalized by live cells is critical for nanodrug delivery and related research initiatives. It is also often necessary to understand how these nanoparticles are co-localized with specific subcellular components. A common method to accomplish this task is to utilize standard fluorescence imaging techniques to observe fluorescently labeled nanoparticles and labeled cellular features. However, fluorescent labeling of nanoparticles can sometimes be difficult to achieve. There can also be significant limitations in specificity when observing labeled nanoparticles in cells using traditional fluorescence imaging techniques. However, by using CytoViva's patented enhance darkfield illumination system and dual mode fluorescence capability, it is possible to observe unlabeled nanoparticles along with fluorescently labeled and non-labeled cellular structures, simultaneously and in real time.

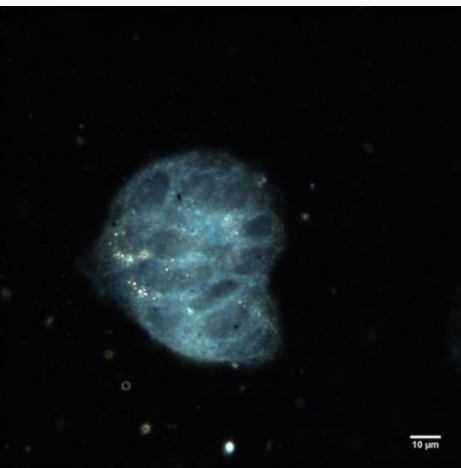


Figure 1: Enhanced Darkfield

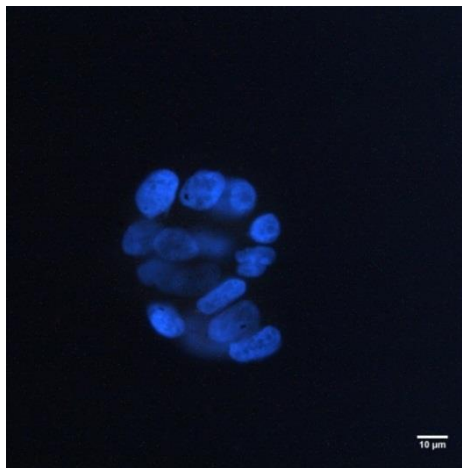


Figure 2: Full Fluorescence

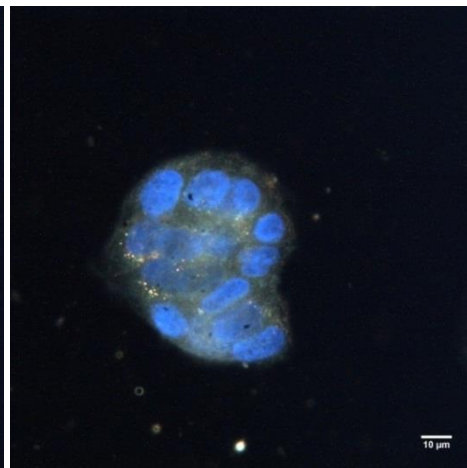


Figure 3: Dual Mode Fluorescence

CytoViva's Dual Mode Fluorescence module (DMF) connects via liquid light guide to a fluorescent optimized light source and then to the CytoViva optimized darkfield illumination system, providing a transmitted-light fluorescent capability. The DMF contains a filter wheel holding standard excitation fluorescent filters, which can be moved through the collimated light to proportionally provide fluorescent excitation light along with full spectrum light onto the field of view. A three channel emission filter above the microscope objective enables both the full spectrum illumination and emission from fluorescence to be observed simultaneously. **Figure 1** is a CytoViva enhanced darkfield image illustrating cells with internalized AuNPs. **Figure 2** is a full fluorescent image illustrating DAPI stained nuclei of cells. **Figure 3** is a CytoViva DMF image illustrating in real time, AuNPs, fluorescent labeled nuclei and unstained cell components.