

Observing AgNP Bacterial Cell Interactions

Silver nanoparticles (AgNPs) are now being utilized as antimicrobial agents in a wide range of applications including water filtration, food packaging and consumer products due to their proven antimicrobial efficacy across a wide range of pathogens. However, there is much to be understood regarding the interaction between AgNPs and many of these pathogens and how this antimicrobial effect can be further optimized.

Significant insight can be discerned from simply observing the real time interaction between AgNPs and pathogens. One of the fastest growing methods for this observation process is CytoViva's Enhanced Darkfield Hyperspectral Microscope.

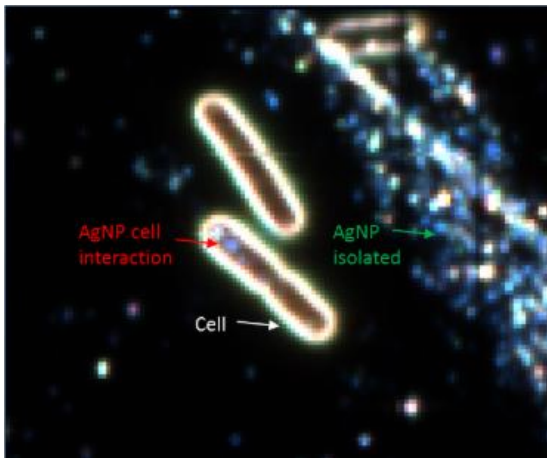


Figure 1: Enhanced Darkfield Hyperspectral Image of AgNP Bacterial Interaction

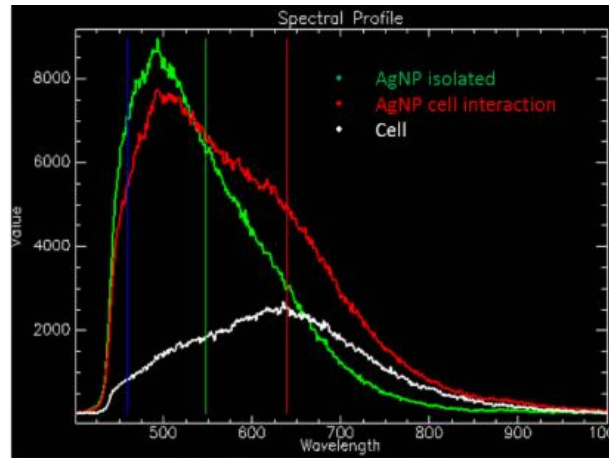


Figure 2: Spectral Response of AgNP, Bacteria and AgNP Bacterial Interaction

With the CytoViva system, rapid observation of AgNP and bacterial cell interactions can be conducted in seconds with no special sample preparation. Additionally, hyperspectral images of these sample elements enable spectral confirmation of the nanoparticles and their colocalization on, or in, the pathogenic target.

In the example images above, citrate stabilized AgNPs were incubated with gram positive rod shaped bacillus bacteria. In Figure 1, AgNPs can be observed interacting directly with the bacteria, as well as, isolated away from the bacteria. Figure 2 illustrates the spectral response of the isolated AgNPs, the bacterial cell and the AgNP bacterial cell interaction. Note that the AgNP bacterial cell interaction spectral response combines spectral features of both elements.

If your research requires a better understanding of how nanomaterials interact with pathogenic specimens or other biological or materials based matrixes, CytoViva's Enhanced Darkfield Hyperspectral Microscope can serve to quickly advance your work. In addition, the high contrast images produced by the system, combined with spectral confirmation of the sample elements, will demonstrate your results for publication in a highly definitive manner.

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.