

NANO WORLD SUMMIT: CURRENT AND FUTURE PERSPECTIVES

June 06-07, 2018 | Philadelphia, USA

Nanoclays and nanoceramics in diagnostic microbiology

Claudio Rodríguez Martínez

National Center of Biological Products, Cuba

With the development of nanotechnology new materials based on the transformation, modification, or combination of natural clays and ceramics have been obtained for different applications in microbiology. Most of these applications are directed to inhibit the growth of bacteria and fungi combining them with silver and other inhibiting substances. Nevertheless, nanotechnology opens new possibilities to detect and identify microorganisms with high accuracy and in few minutes. Different technologies were developed based on the fabrication of nanocomposites with nanoceramics, monoclonal antibodies, DNA or RNA fragments, and biomarkers. Our group has developed a technological platform for the fast and accurate detection of bacteria and fungi by combining nanoclays and nanoceramics with enzyme specific fluorogenic and chromogenic substrates. We also included in the composition different nutrients and activators of the microbial metabolism that allow reduction of the lag phase of bacterial growth and the detection of specific enzymes activity at this early stage of growth. With these new nanocomposites we have been able to identify different microorganisms within few minutes. As an example, it was possible to detect *E. coli* directly in urine sample in just 10 minutes allowing the further timely and efficient antibiotic therapy.

cyi@qc.cuny.edu