

# **Nanotechnology for Analysis and Bioanalysis**

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Nanotechnology provides unique materials and systems for the development of new analytical and bioanalytical sensing platforms. The topic will be introduced with the use of metallic nanoparticles (NPs) for the development of ultrasensitive surface plasmon resonance (SPR) sensors using imprinted Au NPs composites for the analysis of explosives, antibiotics, amino acids and more, and for the development of amperometric biosensors (based on enzymes, DNA, aptamers).

Also, the use of semiconductor quantum dots (QDs) for the development of sensing and biosensing platforms will be addressed. Examples will include the development of biosensors for analyzing different enzymes (telomerase, kinase, phosphatase), the design of DNA sensors and aptasensors, the assembly of ion sensors and the use of functionalized QDs for analyzing explosives.

Finally, the use of nucleic acid nanostructures for the analysis of nucleic acids, molecular targets, and ions, will be addressed by introducing molecular "DNA-machines" for amplified sensing, and by the self-assembly of supramolecular DNA structures for amplified sensing.