

## Ultrasensitive Surface Plasmon Biosensing

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### BRIEF DESCRIPTION

In the areas of diagnostic and discovery applications surface bioaffinity sensing using either SPR sensors or LSPR sensors is currently being used for the detection of proteins, antibodies and nucleic acids. By combining the advantages of both SPR and LSPR, researchers at UCI have developed Nanoparticle-Enhanced Diffractions Grating biosensors (NEDG) that are able to detect unmodified DNA at a concentration of 10fM.

### FULL DESCRIPTION

Researchers in UCI's Chemistry Department have developed a novel detection method that utilizes a combination of gold nanoparticles and surface plasmon coupled gold gratings to create an ultra sensitive surface bioaffinity sensor. By combining the optical properties of gold nanoparticles that are adsorbed onto the grating surface in the presence of a biomolecule target and the optical properties of planar surface Plasmon polaritons generated on micron-scale gold gratings they have achieved enhanced sensitivity that is over 100 times more sensitive than current techniques.

DNA detection limits of 10fM have been demonstrated using the NEDG methodology. Typically, the analysis of such low DNA concentrations using standard methods requires the use of enzymatic amplification (ie PCR). However this process has limitations in that the amplification is nonlinear making it difficult to accurately assess the original target concentration.

With UCI's NEDG method, ultrasensitive measurements of genomic materials can now be made without the need for further amplification.

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### OTHER INFORMATION

#### CATEGORIZED AS

- » **Biotechnology**
- » Bioinformatics
- » Genomics
- » **Medical**
- » Imaging
- » Other
- » Research Tools
- » **Nanotechnology**
- » NanoBio

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