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## Plasmonic Ag-nanodumbbells as highly sensitive SERS sensors

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**P**rotein detection is of fundamental importance in the field of biosensing. In recent years surface enhanced Raman spectroscopy (SERS) has proven to be very effective technique due to its non-destructive, single molecule detection, high selectivity and fluorescence-quenching properties. The enormous signal enhancement associated with the use of gold or silver nanoparticle amplifying labels (AuNPs or AgNPs) and with the formation of nanoparticle-biomolecule assemblies provides the basis for high sensitive optical biodetection. The multiplexing potential of SERS nanotags relies on the narrow bandwidths of the vibrational Raman spectra of the reporter molecules, and allows the simultaneous recognition of closely related targets. A suitable environment of high SERS activity resides between closely spaced nanoparticles readily obtained in suspensions of NP dimers and small aggregates. This Communication reports a demonstration of SERS analog to the widely used ELISA test for protein detection and identification. Actually, proper control of agglomeration and ligand exchange of those NP-assemblies "hot-spots" enable SERS-based immunosensors with multiplexing capabilities and better detection thresholds than commercially available and widely used ELISA kits.

## Biography

Nekane Guarrotxena received her PhD degree (1994) from Complutense University of Madrid-Spain. She holds post-doctoral positions at the Ecole Nationale Superieure d'Arts ET Metiers at Paris-France (1994-1995) and the University of Sciencell at Montpellier-France (1995-1997). From 2008-2010, she was visiting professor in the Department of Chemistry, Biochemistry and Materials at the University of California, Santa Barbara-USA. She is currently Research Scientist at the Institute of Polymers Science and Technology, CSIC-Spain. Her research interest focuses on the synthesis and assembly of hybrid nanomaterials for sensing and detection based on SERS sensitivity, and therapy applications.

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