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Encoded SERS plasmonic NPs in nanomedicine

Single-molecule sensitivity of SERS has brought to prominence the special role played by so called SERS hotspots. Given that nanometer-scale junctions between nanoparticles produce significant electric field enhancement, the use of SERS-active dimers provides a suitable platform for developing effective sensing, imaging and therapy methodologies. Moreover, the relevant implementation of SERS active species design has opened new pathways and strategies for the SERS application in the clinical and medical field. Herein, I will present how encoded SERS metal NPs result promising multifunctional nanomaterials for biomedical applications. Particularly, SERS tag-synthesis, assembly and optical features will be stated and several examples of their use in detection, imaging, drug loading and therapy will be provided in order to show the remarkable and potential applicability in nanomedicine on the basis of their unique physicochemical features, sensitivity, selectivity and multiplexing capabilities.

Biography

Nekane Guarrotxena was a PhD in chemistry from the University of Complutense, Madrid-Spain (1994). She held post-doctoral research positions at ENSAM, Paris-France (1994-1995) and University of Montpellier-France (1995-1997). She was the Vice-Director of ICTP-CSIC (2001-2005) and visiting-professor at UCSB and at UCI, California-USA (2008-2011). She is currently Research Scientist at the ICTP-CSIC-Spain. She has published more than 60 peer-reviewed publications, 4 books (also co-editor), more than 24 book chapters and 1 patent; and serves as an Editorial Board member of several journals, organizing committee member of scientific-technological events and External Expertise Consultant on I+D+i for National and International Agencies. Her studies focuse on the synthesis and assembly of hybrid-nanomaterials, nanoplasmonics, smart nanomaterials and their nanobiotechnology applications (bioimaging, drug delivery, therapy and biosensing).

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