Nuevas Estrategias para el Análisis De Residuos en Alimentos Utilizando Anticuerpos y Micro(Nano)Sistemas

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Recent advances on nanobiotechnology are having a great impact in science as result of the confluence of physical sciences, molecular engineering, biology, biotechnology and medicine. In the analytical chemistry field, the combination of the latest micro(nano)technological and biotechnological advances have given rise to a wide variety of novel diagnostic and bioanalytical approaches. As an example, biosensors are able to provide specific quantitative signals as result of subtle changes of physical properties, such as the dielectric field or the refractive index, produced when biomolecular recognition events take place at the surface of appropriate designed transducer devices. Since their conception biosensors have created great expectations regarding their potential impact in the environmental, food safety and clinical fields, due to their capabilities as analytical tools. Nowadays, the knowledge of novel physical properties inherent to the nanoscale of certain materials and of nanoparticles have opened the door to develop functional hybrid biomaterials with improved features and capabilities for residue analysis.

Research in nanobiotechnology has allowed developing approaches to construct functional multiplexed (bio) hybrid biomaterials through novel approaches such as DNA-directed immobilization(DDI)strategies[1]. On the other hand, *antibodies* as biorecognition elements have fascinating features in addition to the possibility to respond selectively to biological or bioactive substances. Thus, they can be produced in principle against all kind of substances and their features can be tailored according to the requirements of each application. Combined with appropriate transducer materials or nanoparticles as tag systems, it is possible to enhance and expand detectability of novel devices. Thus, based on the well-know plasmon resonance effect generated at the surface of a metal (usually Ag or Au) novel SPR biosensors (surface plasmon resonance) with improved features are being developed[2] . A step forward is the use of nanoparticles with plasmon resonant properties that can be tuned as function of the size, shape and material properties of the particle. Recently, we have demonstrated the potential of this approach to detect small concentrations of anabolic androgenic steroids[3] thanks to the effect produced in the resonance peak (frequency band of the scattered light) as a result of the specific antibody-steroid biomolecular interaction. All these biosensors approaches can integrated lab-on-a chip (LoC) easy to use devices that can improve speed and efficiency of the residue analysis in the food safety field, as it will be shown with some examples.

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