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DENDRIMERS-MODIFIED SOLID SUPPORTS: TOWARDS NANOSTRUCTURED MATERIALS FOR CLINICAL DIAGNOSTIC

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Nanociencia y Nanotecnología

The design and synthesis of new materials for biomedical applications is a high-priority research topic in a number of biomedical areas. The rapid development of nanotechnology over the past few decades has created wide prospects for using nano- and micro-scale materials in such areas, where careful control of interactions between particles and biosystems is essential for effective use of these materials in biomedicine. Worth special note in this respect is the use of nanoparticles in diagnostic assays, where chemists are playing an increasingly role in designing and producing new materials for manufacturing sensors affording increased sensitivity and selectivity relative to conventional diagnostic systems. The three-dimensional architecture of dendrimeric systems confers them some intrinsic features such as structural homogeneity, integrity, controlled composition and high-density multidentate homogeneous ends ready for (bio)conjugation. These properties make dendrimeric systems unique and stable enough for a variety of applications. This has boosted the use of dendrimers for biosensing purposes in recent years.

We describe here recent progress in the preparation of new materials for biosensor applications. Specifically, we report on the use of zeolites and silica particles as a solid support for RadioAllergoSorbent Test (RAST) with a view to its use as a complementary diagnostic method for identifying allergic responses to drugs. To this end, we prepared nanoconjugated Dendrimeric Antigens (DeAn) peripherally decorated with the suspected amoxicillin hapten. Zeolites and Silica particles were modified with these novel synthetic Dendrimeric Antigens to obtain DeAn@Zeolite or SiO₂NP which constitutes an effective, innovative nano system for biosensing.