Preparation of Dendrimeric antigen-silica particle composites

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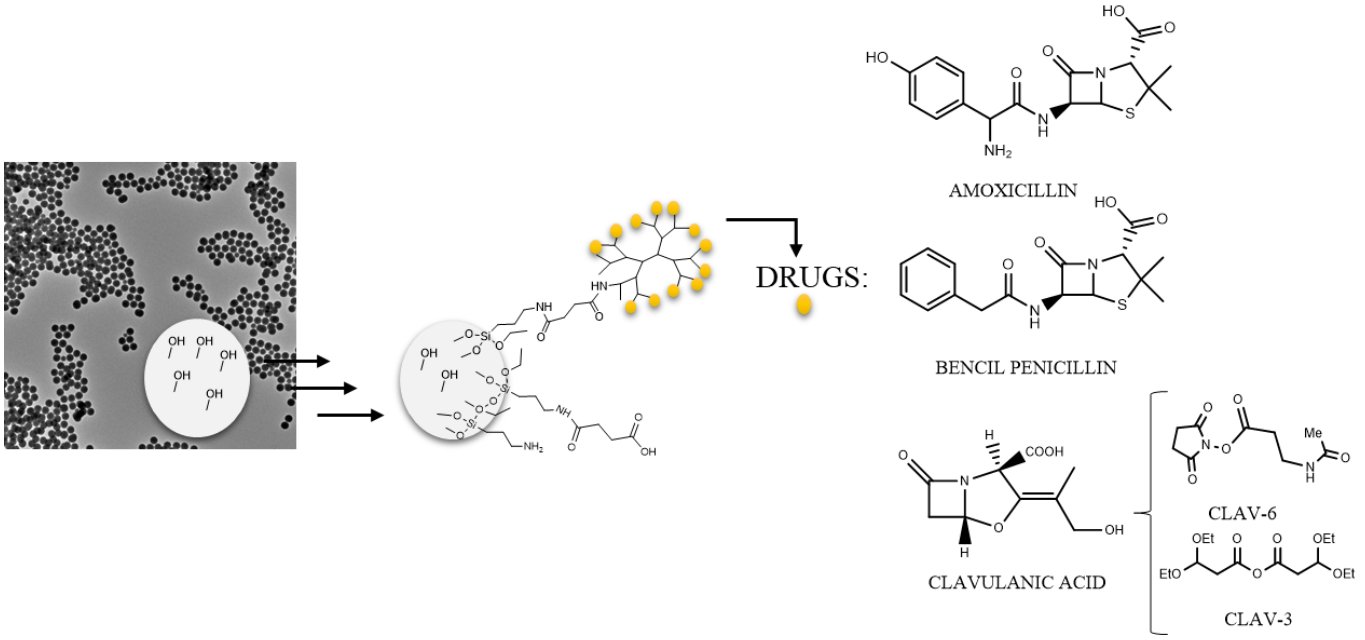
The desing and synthesis of new materials for biomedical applications is a high-priority research topic in a great number of biomedical areas. Moreover, advances in the fabrication of these materials are of growing interest in antibody-based diagnostic techniques. These materiasl consist in a solid support anchored with the desired bioactive molecules. Such solid supports need to be robust enough and posses surrounding reactive groups that enables the chemical bonding of the active components. Furthermore, these materials need to meet certain conditions to ensure biocompatibility and non-toxicity. In this sense, silica nanoparticles have been widely used.



Our research involves the study of hybrid materials that combine the high functionality of silica nanoparticles with well defined size and controlled peripheral multivalence components like dendrimers. Dendrimer antigens, which are synthetic antigens where the role of the carrier protein is performed by a dendrimer, were supported on silica particles.

These organic-inorganic hybrid materials were carefully characterized and the preparation methodology was confirmed to be highly reproducible. Such hybrid materials were used for the *in vitro* diagnosis of patien allergic to amoxicillin.[1] Herein, we present the preparation of novel nano-materials containing new antigenics determinants of antibiotics. Amoxicillin, bencyl penicillin, clavulanic acid and its derivates were used to prepares diferent dendrimeric antigens supported on silca particles. These particles will be used to specifically and selectively detect and quantify IgE in sera from allergic patients. These new materials are a promising candidate to improve the practice of *in vitro* clinical diagnosis.

References

(1) Vida, Y.; Montañez, M. I.; Collado, D.; Najera, F.; Ariza, A.; Blanca, M.; Torres, M. J.; Mayorga, C.; Perez-Inestrosa, E. Dendrimeric Antigen-Silica Particle Composites: An Innovative Approach for IgE Quantification. *J. Mater. Chem. B* **2013**, *1* (24), 3044–3050. https://doi.org/10.1039/c3tb20548g.