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SYNTHESIS OF FLUORESCENT BAPAD DENDRIMERIC STRUCTURES FOR BIOMEDICAL APPLICATIONS

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In this work, we present the synthesis and characterization of BAPAD¹ fluorescent Dendrimeric-Antigens (DeAn), to study the dendritic cell maturation as a test to detect drug allergy reactions.

Recently our research group developed a new kind of dendrimer, called BAPAD¹, that we have used in this work to obtain the dendrimeric moiety of the target molecule. To this avail we synthesized a generation two BAPAD dendrimer using cystamine as core. Then, the free amine groups on the surface of the dendrimer were functionalized with an amoxiciloyl group (AXO), the allergenic determinant to the beta-lactam antibiotic amoxicillin. By the reduction of the disulfur bond we obtained two dendrons with a thiol group in the focal point, useful to attach a fluorescent probe.

We synthesize as fluorescent moiety a naphthalimide derivative with a maleimide group upon which the thiol group of the dendron is added by a click reaction.² In this way we obtained the target molecule to be used in the basophil activation test. The fluorescent DeAn (F-DeAn) has been fully characterized by NMR and MS techniques, and their fluorescent properties well established in aqueous biological media. The fluorescent dendron without the haptenic moieties at the periphery has been also obtained and fully characterized as a control assay. Both molecules have been also characterized using molecular dynamics simulation calculations.

We show also here how these dendrimeric structures interact with dendritic cells and are internalized by them.

¹ Patent Number: PCT/ES2012/000136, **2012**, Perez-Inestrosa, E.; Ruiz, A. J.; Najera, F.; Vida, Y.; Collado, M.; Mesa, P.

² Hall, D. J.; Van Den Berghe, H. M.; Dove, A. P. *Polym. Int.* **2011**, *60*, 1149-1157.