Preparation, photophysical properties and cell image of Naphthalimide-based fluorescent nanostructures for biomedical applications: BAPAD dendrimeric antigens and silica nanoparticles.

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We present here the synthesis and characterization of BAPAD [1] fluorescent Dendrimeric-Antigens (DeAn), to be applied in basophil activation as a test to detect drug allergy reactions.

A second generation BAPAD dendrimer using cystamine as core that can be reduced to obtain two dendrons with a thiol group in the focal point, useful to attach a fluorescent probe, have been synthesized. 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. The fluorescent DeAn (F-DeAn) has been fully characterized by NMR and MS techniques, and their fluorescent properties well established in aqueous biological media. F-DeAn 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 here how these dendrimeric structures interacts with dendritic cells and are internalized by them.

In a second approximation, Naphthalimide-fluorescent silica nanoparticles have been prepared and characterized, to be used also in basophil activation test.

References