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CIC biomaGUNE
CENTER FOR COOPERATIVE RESEARCH IN BIOMATERIALS

SEMINAR

Thursday, 7th June, 12.00 pm, Seminar Room

Host: Prof. Luis M. Liz-Marzán

Polymer-based nanoparticle libraries for targeted anti-inflammatory strategies

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The goal of the project is to develop polymer-based, nanoparticulate carrier materials for pharmaceutically active ingredients for targeted therapy of diseases and syndromes, whose morbidity is characterized by an inflammatory reaction. With the aid of systematic particle libraries, structure-property relationships of polymers or nanoparticles and their biological effects are to be determined. New functional polymers are being developed to produce the nanoparticles (*e.g.,* polyester amides, polyketals, functionalized polysaccharides, cationic polymers), tailor-made for the anti-inflammatory agent to be included. Thereby, both known and new drugs will be investigated, and various release mechanisms will be tailored. In order to increase the circulating time in the body and minimize unwanted interactions with proteins, the nanoparticles will be functionalized with "stealth" polymers (*e.g.,* polyethylene oxide, poly(2-oxazoline)). Cell specificity is achieved by active or passive targeting, whereby the coupling of antibodies, peptides or other molecules with specific recognition structures plays a major role. Suitable dyes are included in the carrier materials or covalently attached to enable diagnostic approaches. The nanoparticles are further investigated in detail with respect to their physicochemical properties as well as their biological / pharmaceutical suitability – also taking into account physiological conditions – in *in vitro* and *in vivo* models. For this purpose, already established techniques are used, but also new methods are being developed to identify long-term suitable formulations for nanomedicines. Close cooperation within the multi- and interdisciplinary consortium with researchers from Chemistry, Materials Science, Biology, Pharmacy and Medicine offers unique prerequisites for transferring the findings from basic research into applications.