

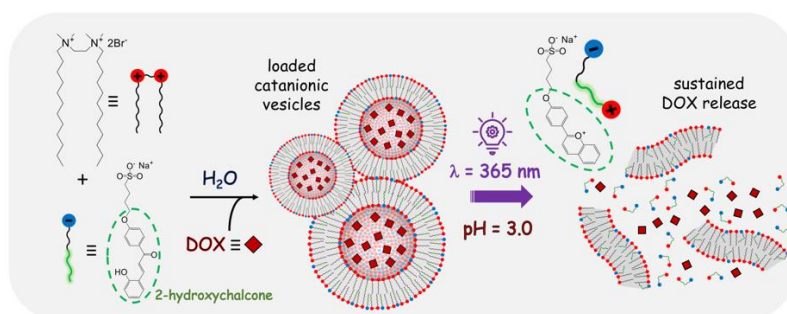
Stimuli-responsive nanocarriers for drug/gene delivery: from molecular design to proof-of-concept

Eduardo F. Marques

Centro de Investigação em Química da Universidade do Porto

Institute of Molecular Sciences

Faculty of Sciences, University of Porto



Surfactant nanostructures - such as vesicles, micelles, nanotubes, nanogels and microemulsions - present numerous advantages for the encapsulation and release of drugs and nucleic acids, such as greater safety and efficacy of the drug, greater bioavailability and greater stability against chemical degradation and enzymatic [1]. Concomitantly, spatially and temporally localized drug delivery is a promising strategy to circumvent adverse effects of traditional therapy such as drug toxicity and prolonged treatments, and stimuli-responsive nanostructures can play a key role to achieve those goals. In this seminar we will address recent work on colloidal nanocarriers based on conventional surfactants and novel surfactants (e.g., lysine [3], serine[4,5] and threonine[6] derivatives), with a focus on catanionic vesicles. The biomolecules transported include drugs (doxorubicin)[5], proteins (lysozyme)[3] and nucleic acids (siRNA)[4]. Most of the surfactants used present functional groups and aggregation behavior sensitive to stimuli, namely pH, temperature and light irradiation (photosurfactants based on the flavylum chemical network [6]), which gives the nanoaggregates interesting properties for controlled delivery.

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