Development of drug-loaded magneto-sensitive liposomes investigated by fluorescence techniques

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Magneto-sensitive liposomes can be obtained by encapsulation of magnetic nanoparticles into liposomes or by the coverage of magnetic nanoparticles with a lipid bilayer. The so-called magnetoliposomes make possible to explore the synergistic effect between chemotherapy and magnetic hyperthermia in cancer therapeutics. Both aqueous magnetoliposomes (magnetic nanoparticles entrapped in liposomes) and solid magnetoliposomes (clusters of nanoparticles covered by a lipid bilayer), containing biocompatible magnetic nanoparticles, have been developed [1-3], exhibiting a superparamagnetic behavior and diameters below 150 nm.

These nanosystems were successfully tested as nanocarriers for fluorescent potential antitumor drugs. Drug-loaded magnetoliposomes have shown the ability to interact by fusion with models of biomembranes [1-3] and to release the antitumor drugs in *in vitro* assays using human tumour cell lines [2]. Fluorescence-based methodologies, including Förster Resonance Energy Transfer (FRET), emission quenching and fluorescence anisotropy, have been used as valuable tools for this investigation.

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