

A multifunctional nanocomplex for enhanced cell uptake, endosomal escape and improved cancer therapeutic effect - DTU Orbit (09/11/2017)

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Aim: To evaluate the chemotherapeutic potential of a novel multifunctional nanocomposite encapsulating both porous silicon (PSi) and gold (Au) nanoparticles in a polymeric nanocomplex. **Materials & methods:** The nanocomposite was physicochemically characterized and evaluated in vitro for biocompatibility, cellular internalization, endosomolytic properties, cytoplasmic drug delivery and chemotherapeutic efficacy. **Results:** The nanocomposites were successfully produced and exhibited adequate physicochemical properties and superior in vitro cyto- and hemocompatibilities. The encapsulation of PSi nanoparticles in the nanocomplexes significantly enhanced their cellular internalization and enabled their endosomal escape, resulting in the efficient cytoplasmic delivery of these nanosystems. Sorafenibloaded nanocomposites showed a potent in vitro antiproliferative effect on MDA-MB-231 breast cancer cells. **Conclusion:** The multifunctional nanocomposite herein presented exhibits great potential as a chemotherapeutic nanoplatform.

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