Direct targeting of metastatic melanoma cells through anti-CSPG4-conjugated nanoparticles and natural loaded vesicles.

Target specific inhibition of survival and proliferative pathways in cancer cells is an important therapeutic strategy. On these bases, the development of a system able to convey therapeutic agents inside the tumor cells in a direct and specific way represents an important goal in biomedical research. The nanoparticles represent an important chance in this field: they can easily penetrate tissues and cells, restrict the biological effect of the drug on a specific cell type and modify the pharmacokinetic properties, thus allowing a prolonged drug release over time. In our work, we synthetized chitosan nanoparticles entrapping miR126 (CS-126s), a microRNA able to induce tumor regression in metastatic melanoma and to increase the effects of targeted therapies. Because our main focus was to obtain a selective delivery of miR126, we synthetized CS-126 conjugated to a single-chain-antibody able of specific binding to “melanoma-associated chondroitin sulfate proteoglycan” (CSPG4). This study aims to find an effective way to deliver drugs directly into cancer cells to increase their therapeutic potential reducing toxic effects.