

Spray delivery system using mussel-inspired sticky protein nanoparticles for focal cancer treatment

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Chemotherapy has been widely used to remove residual cancer cells and prevent recurrence after removal of primary tumor. However, there still remains clinical obstacles such as insufficient accumulation and systemic toxicity. Therefore, local drug delivery system has received great attention to achieve improved accumulation to the site of action and avoid side effects. Here, we propose novel spraying system using mussel adhesive protein (MAP)-based sticky nanoparticles (NPs) to provide local delivery of anticancer drugs. We confirmed that the MAP NPs were successfully sprayed onto target sites and exhibited great retention via adhesive property. The doxorubicin (DOX)-loaded MAP NPs (MAP@DOX NPs) showed pH-responsive drug release mediated by Fe³⁺-DOPA complexes. We exploited the sprayed MAP@DOX NPs to inhibit further growth of tumor *in vivo*, indicating the potential applicability for local drug delivery. We anticipate that the MAP-based sprayable sticky NPs provide a promising approach for focal cancer therapy that requires improved locoregional drug delivery.