




# Sustained release system of paclitaxel based on composite nanofibers for inhibiting renal clear cell carcinoma

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## ABSTRACT

The recurrence and metastasis of renal cell carcinoma are severe challenges in clinical treatment. At present, it is urgent to find a strategy to solve this problem and improve the therapeutic effect. In this study, we designed a programmed release system of anticancer drugs by preparing a nanofiber system with two kinds of diameters and biomaterials (polylactic acid-glycolic acid (PLGA) and silk protein) as drug carriers (paclitaxel), which inspired the occurrence and pathological microenvironment of renal cell carcinoma. The controlled degradation of PLGA nanofibers as a drug carrier achieved the short-term release of paclitaxel, which could rapidly inhibit the spread and metastasis of renal cancer, while the silk protein nanofibers as a drug carrier with slow degradation could provide the long time and continuous release of paclitaxel to prevent the proliferation of renal cancer cells and inhibit recurrence. The synergistic effect of the sustained release system of paclitaxel successfully achieved inhibition of the recurrence and metastasis of renal cell carcinoma and improve the therapeutic effect of renal cell carcinoma. The paclitaxel release profile showed that the PLGA nanofiber drug system provided controlled release of paclitaxel in the first 14 days, while the silk protein nanofiber system provided a relatively stable and long-duration release of

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