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Mesoporous nanoparticles-incorporated temperature-sensitive hydrogel for controlled drug/gene delivery in brain tumor

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Malignant brain tumor is a serious disease. Patients treated using surgical resection, radiotherapy and chemotherapy survive, on average, for 6-24 months post-treatment. To date, surgery still is the primary treatment for brain tumor, following with chemotherapy is necessary to prevent the tumor recurrence. However, many potentially effective diagnostic or therapeutic agents are prohibited to deliver into brain by blood-brain barrier (BBB), resulting in the failure of chemotherapy. To overcome the problems, we develop a mesoporous nanoparticles-incorporated temperature-sensitive hydrogel to slowly release drugs and gene in the brain tumor. Our preliminary data showed that hydrogel could be transferred to gel from solution phase while the temperature was raised higher to 32 then sustainably released the drugs over three weeks. This delivery system is expected to overcome the BBB, significantly reduce the side-effects and effectively prohibit the growth of residual tumor cells.

Keywords: mesoporous nanoparticles, temperature-sensitive hydrogel, brain tumors, drug delivery and gene delivery.

Biography

Feng-Wei Lin is currently M.S. student in Institute of Medic Science and Technology at National Sun Yat-sen University, Taiwan. He received his B.S. degree in Materials Science and Engineering from Dayeh University, in 2014. His current research interests include the design and fabrication of nanoparticles and temperature-sensitive hydrogel for drug/gene delivery in cancer therapy.

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