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Targeting therapy of hepatocarcinoma by a peptide directed doxorubicin/miRNA liposome

Yingchun Hou
Shaanxi Normal University, China

Hepatocellular carcinoma (HCC) is a severe malignant disease to threaten human life safety, and current chemical therapeutic methods are usually developed with low efficacy and high side effects because they have no enough specific targeting to cancer cells and cannot inhibit the multiple drug resistance (MDR) of chemical therapeutics. HCSP4, a 12aa peptide was screened out in our lab using the bio-panning method from a phage displayed peptide library, and it binds to HCC cells with high specificity and sensitivity. In our study, to develop a HCC targeting chemical therapeutic delivery system with high HCC therapeutic efficacy, low side effects and satisfactory resistance for MDR, HCSP4 and miR101 were used to construct the HCC targeting DOX (doxorubicin) delivery liposome system, HCSP4-Lipo-miR101-DOX. The results in vitro showed that HCSP4-Lipo-miR101-DOX presented the much enhanced cytotoxicity to HepG2 cells and HepG2/ADR cells (DOX resistant HCC cells). To explore the mechanism by that HCSP4-Lipo-miR101-DOX presents the reversal of MDR of DOX, the expression of the genes were of the potential to be the targets of miR101 was detected with western blot. The result indicated that the expression of some genes associated with membrane transportation and cancer growth was significantly inhibited, such as ABCC5, COX-2, P-gp, VEGF, STX1A, and EZH2. The results above suggested that the HCSP4 conjugated DOX delivery system, HCSP4-Lipo -miR101-DOX is of the great promising potential to be developed as an important efficient drug system for the therapy of HCC with low recurrence, its mechanism against MDR is discussed in the study. This approach is also an important strategy can be referenced for other cancer therapeutics study.

Biography

Yingchun Hou has completed his MD and PhD degrees in 1997 at The Fourth Military Medical University, China. He has his experience as Postdoctoral Scholar, Postdoctoral Research Associate and Senior Scientist in USA NIH and other institutions from 1998 to 2006. From January 2006 to date, he holds the position of Professor and PI in Shaanxi Normal University, China. His researches focus on the molecular and cellular biology of cancer, published papers more than 100, and got 10 of Chinese patents approved. He concluded and created the theory of spatiotemporal cell biology and its core frame, triple W and signal basin in the world firstly. He is the Associate Chairman for the Shaanxi Society for Genome and Health, the Member of the American Society for Biochemistry and Molecular Biology, and the Member of American Society for Microbiology. His current research projects include the functions of tumor associated genes and signal regulation and the target to cancer cells and the targeting therapy for cancers.

ychhou@snnu.edu.cn

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