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CD44 conjugated liposomes for molecular imaging and herapeutic application in hepatocellular carcinoma

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Conventional therapies target rapidly proliferating non-tumorigenic cells, spare the relatively quiescent cancer stem cells (CSCs) and the CSCs will remain viable after therapy and re-establish the tumor. Thus developing therapeutic strategies to target cancer stem cells to prevent tumor recurrence will be vital for cancer therapy. Here, we developed a new strategy which targets on CSCs by anti-CD44 antibody mediated nanoparticles delivery system loaded with doxorubicin (DOX) or the suicide gene-herpes simplex virus truncated thymidine kinase (TTK), which was fused with renilla luciferase (RL) and RFP (RL-RFP-TTK). The *in situ* liver cancer model was established by injection of 1.0×10^5 HepG2 cells, which carry a reporter system encoding the genes of firefly luciferase and GFP into the liver of NOD/SCID mice. The mice were subsequently treated with ganciclovir (GCV). Then the growth status of tumor was monitored by the optical bioluminescence imaging of firefly luciferase and the specific targeting of the nanoparticles was tracked by imaging of renilla luciferase. Anti-CD44 antibody mediated nanoparticles loaded with Dox or TTK could specifically target the CSCs of HCC, and thereafter were endocytosed by the plasma membrane to transport Dox or the triple fusion (RL-RFP-TTK) into the cells, resulted in the apoptosis of the targeted cells. Taken together, our study demonstrated a novel therapeutic strategy by targeted CSCs of HCC, we also developed a useful multimodality imaging techniques to monitor HepG2 cells' fate *in vivo* and assessed the targeted efficacy of the nanoparticles.

Biography

Zongjin Li has completed his Ph.D from Peking Union Medical College and postdoctoral studies from Stanford University School of Medicine. He is the director of Department of Pathophysiology, and his research focus on molecular imaging and stem cell therapy. He has published more than 27 papers in reputed journals.