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Targeted gene therapy and *in vivo* bioluminescent imaging for monitoring postsurgical recurrence and metastasis in mouse models of liver cancer

Q. He*, C.L. Yao*, L. Li, Z. Xin, Z.K. Jing and L.X. Li

Department of Hepatic, Biliary, Pancreatic, and Splenic Surgery,
Beijing Chaoyang Hospital of Capital Medical University, Beijing, China

*These authors contributed equally to this study.
Corresponding author: L.X. Li
E-mail: xqhdoc@163.com

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ABSTRACT. We investigated the effects of combined targeted gene therapy on recurrence and metastasis after liver cancer resection in nude mice. Twenty BALB/C mice were randomly divided into control and treatment groups with 10 mice in each group and a male/female ratio of 1:1. Luciferase gene-labeled human primary hepatic carcinoma cell line MHCC97-H was then used to prepare a carcinoma model. An optical *in vivo* imaging technique (OIIT) was used 10 days later to detect the distribution of tumor cells, followed by partial liver resection and gene therapy. In the treatment group, 100 μL phosphate-buffered saline (PBS) containing 1 x 10^{12} rAAV/AFP/IL-24 gene viral vectors was injected into liver sections and peritumoral posterior peritoneal tissues; in the control group, the same amount of PBS containing 1 x 10^{12} empty viral vectors was injected at the same sites. OIIT was then used to detect the *in vivo* tumor metastasis 21 days later. Luciferase

gene-labeled human primary hepatic carcinoma cell line MHCC97-H successfully infected 20 nude mice, and OIIT showed that the two groups exhibited metastasis after local tumor resection, but there were more tumor cells in the control group ($P < 0.05$). rAAV/AFP/IL-24 gene therapy can inhibit recurrence after liver cancer resection.

Key words: Hepatocellular carcinoma; Recurrence and metastasis; Combined gene therapy