HepG2: Orthotopic Liver Tumor Model

REACTION BIOLOGY

IN VIVO TESTING SERVICES

➢ Orthotopic tumor models

Implantation of tumor cells into the organ of origin ("orthotopically") allows organotypical interaction between tumor cells and surrounding stroma. It has been shown that this interaction affects growth, differentiation, and drug sensitivity of tumor cells. Moreover, tumor cells can spread to metastatic sites in other organs, with specificities comparable to the human condition.

➢ HepG2 cells

A human liver tumor cell line (ATCC-No: HB-8065) established from a hepatocellular carcinoma of a 15-year-old, white, male youth. The cell line exhibits epithelial-like morphology.

In order to detect the orthotopically implanted cells, a luciferase expressing cell pool was generated via transduction of a luciferase-antibiotic construct and subsequent antibiotic selection.

➢ In vivo bioluminescence measurement

After inoculation, the growth of the cells will be monitored via in vivo bioluminescence imaging (BLI). Using BLI, the animals are randomized into treatment groups according to apparent tumor sizes. Moreover, once treatment is initiated, effects on the total in vivo bioluminescence signal, and thus primary tumor and potential metastatic loci may be monitored.

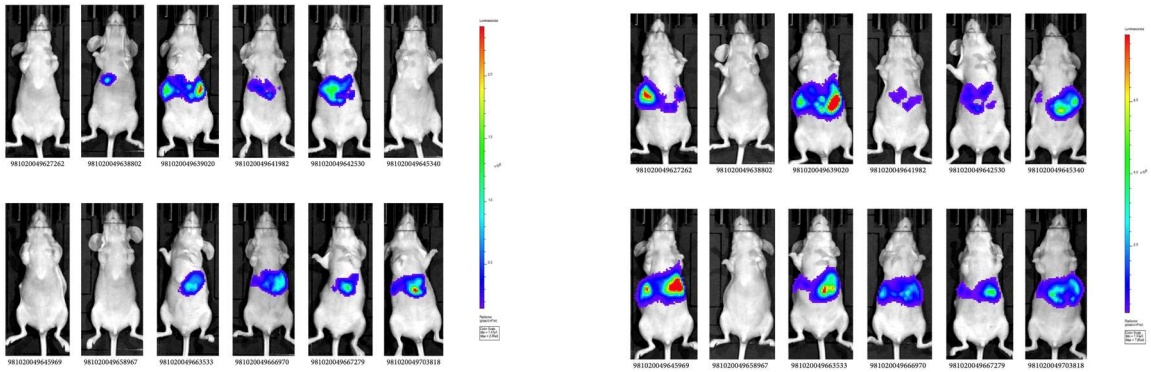

Figure 1: In vivo bioluminescence.
Mice with HepG2 tumors are shown 1 days (left image) and 14 days (right images) after inoculation.

➢ Tumor growth

Luciferase-expressing HepG2 cells were injected in the spleen of immune compromised mice followed by splenectomy. Cells migrate via the vena lienalis into the liver initiating orthotopic tumor growth.

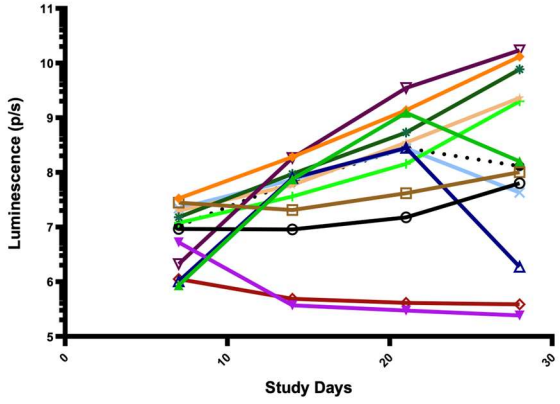

Figure 2: Tumor growth.
Growth of orthotopic HepG2 tumors was monitored in 12 mice via bioluminescence imaging using a IVIS Lumina III system.

Note: Graphs depicted are derived from study examples. Each study is a biological system of its own and subject to intrinsic variation.