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Use of the Woodchuck (Marmota Monax) to Investigate Theranostics for Hepatocellular Carcinoma

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Eastern woodchucks (groundhogs) infected with the Woodchuck Hepatitis Virus are a well-established animal model for interventional human hepatic neoplasm therapies such as embolization. The size of the woodchuck overcomes the geometric constraints on imaging and treatment delivery techniques associated with a murine model, and the viral-induced woodchuck tumors more closely resemble the immune features and complex microenvironment of human hepatocellular carcinoma (HCC). Researchers at the Western College of Veterinary Medicine have explored two potential targets for the radiopharmaceutical treatment of hepatocellular carcinoma in the woodchuck model: prostate-specific membrane antigen (PSMA) and somatostatin receptors (SSTRs). Gene expression in liver tumors and normal organs at risk was studied, and 68Ga and 64Cu-labeled small molecules were used to assess PET imaging uptake. Toxicity after [177Lu] PSMA-617 was assessed. On gross, imaging and microscopic levels, the liver tumors resembled human HCC, and no toxicity after a single dose of [177Lu] PSMA-617 was observed. Clinical progression, gene expression and positron emission tomography uptake were similar to that reported for human patients, confirming the potential of this animal model to investigate targeted radiotherapy for HCC.

Keyword-1

Theranostic

Keyword-2

Positron emission tomography

Keyword-3

Veterinary

Author: MAYER, Monique (University of Saskatchewan)

Presenter: MAYER, Monique (University of Saskatchewan)

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