Lipid Nanocapsules Loaded with Rhenium-188 Reduce Tumor Progression in a Rat Hepatocellular Carcinoma Model

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### Résumé en anglais

**Background**

Due to their nanometric scale (50 nm) along with their biomimetic properties, lipid nanocapsules loaded with Rhenium-188 (LNC188Re-SSS) constitute a promising radiopharmaceutical carrier for hepatocellular carcinoma treatment as its size may improve tumor penetration in comparison with microspheres devices. This study was conducted to confirm the feasibility and to assess the efficacy of internal radiation with LNC188Re-SSS in a chemically induced hepatocellular carcinoma rat model.

**Methodology/Principal Findings**

Animals were treated with an injection of LNC188Re-SSS (80 MBq or 120 MBq). The treated animals (80 MBq, n = 12; 120 MBq, n = 11) were compared with sham (n = 12), blank LNC (n = 7) and 188Re-perrhenate (n = 4) animals. The evaluation criteria included rat survival, tumor volume assessment, and vascular endothelial growth factor quantification.

Following treatment with LNC188Re-SSS (80 MBq) therapeutic efficiency was demonstrated by an increase in the median survival from 54 to 107% compared with control groups with up to 7 long-term survivors in the LNC188Re-SSS group. Decreased vascular endothelial growth factor expression in the treated rats could indicate alterations in the angiogenesis process.

**Conclusions/Significance**

Overall, these results demonstrate that internal radiation with LNC188Re-SSS is a promising new strategy for hepatocellular carcinoma treatment.

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