**Challenge**

Hepatocellular carcinoma (HCC) represents the most frequent type of primary liver cancer and one of the most common malignant tumors worldwide, accounting for > 700,000 deaths per year (third leading cause of cancer worldwide). Risk factors are the infection with hepatotropic viruses (hepatitis B, C), food contamination with aflatoxin, frequent alcohol intake and nonalcholic fatty liver disease. Currently, the only curative treatments for HCC are surgical resection or liver transplantation, but the majority of patients do not qualify for these treatment options due to advanced tumor stages at the time of diagnosis. Also, due to the high rate of tumor recurrence, surgical resection only allows for a five-year survival after surgery of 15-39%. Systemic treatment with the approved multi-kinase inhibitor Sorafenib prolongs survival of HCC patients for 2.9 month accompanied with high treatment costs. Therefore an increase in the therapeutic efficacy of Sorafenib is highly desirable.

**Technology**

The invention discloses p38 alpha (Mapk14) inhibitors as synergistic effectors, which multiply the efficacy of Sorafenib, when applied in combination. Functional validation experiments showed that Sorafenib treatment in combination with RNAi mediated Mapk14 inhibition leads to a significant increase of survival of HCC bearing mice. The genetic data allow the conclusion that the combined treatment with Sorafenib and different Mapk14 inhibiting compounds leads to a decreased proliferation rate and an increase in apoptosis in murine and human hepatomas compared to treatment with Sorafenib alone. Thus, the combination of Sorafenib with MapK14 inhibitors is able to improve the therapeutic effect of Sorafenib significantly.

**Commercial Opportunity**

Technology is offered for co-development or in-licensing.

**Developmental Status**

Data from compassionate use in humans available, phase I clinical trial in preparation, planned start beginning 2018.

**Patent Situation**

Priority filed in July 2011 in Europe and US. International publication WO 2013 007708. Patents granted in US and Europe,

**Further Reading**