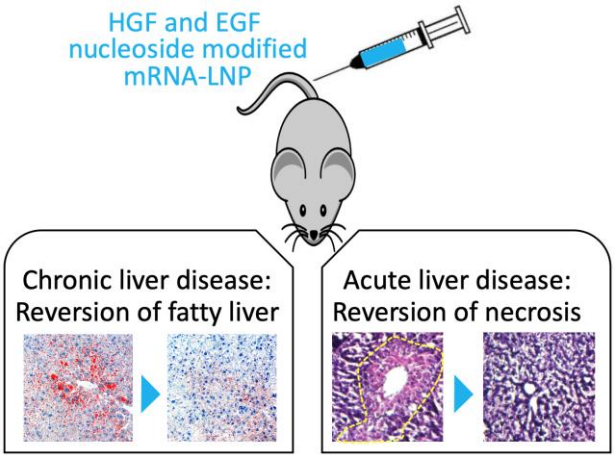
mRNA Therapeutics for Acute and Chronic Liver Diseases

Boston University | Boston, Massachusetts

Abstract

End stage liver disease is the 12th most common cause of death in the United States. Liver transplantation is currently the only cure for end-stage liver diseases, but the shortage of liver donors presents a critical challenge. Although the liver has a robust ability to regenerate by proliferation of mature hepatocytes, in the case of acute massive hepatocyte death or chronic liver injury, proliferation of mature cells becomes exhausted. There is therefore an urgent unmet need for novel therapies to accelerate recovery after an acute damage and prevent continuous hepatocyte necrosis and apoptosis, build-up of steatosis and fibrosis associated with chronic injury.



Boston University researchers have developed a targeted liver regeneration technology comprising of nucleoside-modified mRNA encoding HGF and EGF mitogens, encapsulated in lipid nanoparticles. This invention leverages recent advances in liver regenerative medicine and has the potential to yield a safe and durable treatment for acute and chronic liver diseases.

Boston University researchers are seeking Sponsored Research or an R&D Collaboration to advance this technology.

Benefits

- Modular applications depending on disease stage and severity
- Potent, non-integrative method for transient expression of mitogens into hepatocytes
- Rapid and effective resolution of hepatocyte necrosis and steatosis
- Efficient liver targeting using lipid nanoparticles

Market Applications

- Therapy for acute liver conditions, including acetaminophen overdose
- Treatment of alcoholic liver disease, NAFLD, NASH, cirrhosis, and other chronic liver conditions

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Keywords

mRNA-LNPs

Liver disease

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Publications

Liver repair via transient actovation of regenerative pathways in hepatocytes using lipid nanoparticle-complexed nucleoside-modified mRNA. Rizvi F et al, 2020 (in preparation)