Animal Model for Acute Liver Failure

ID 1977

Background
End-stage liver disease is the tenth most frequent cause of death in the US, causing approximately 25,000 deaths annually. Although only about 2,000 cases of acute liver failure occur each year in the US, the mortality rate remains high. Unlike with the kidneys, lungs, and heart, there are currently no effective support devices that exist for patients with acute or fulminant liver failure. A standardized hepatic failure model that closely correlates to the clinical situation is necessary to demonstrate the efficacy of a liver assist device. Though there have been several animal and pharmacological models, there has yet to be a model that efficiently predicts the clinical efficacy of liver assist devices.

Technology Description
Investigators at the University of Pittsburgh have developed a method to induce a controllable form of acute liver failure in monkeys. The monkeys are treated using liver-directed radiation therapy, followed by mild hepatoxic injury to induce acute liver failure symptoms that are strikingly similar to those in humans.

Advantages
• Reduces the cost of developing liver therapies.
• Improves the efficiency of predicting the effects of liver treatments

Stage of Development
• In vivo data
• Available for non-exclusive license as a research tool
• The University also would welcome opportunities for sponsored-research collaborations to further support this research endeavor.

Applications
• Acts as a model to facilitate the development of therapies for patients with liver failure

Inventor
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Dr. Ira Fox is the Director of the Center for Innovative Pediatric Regenerative Therapies, a joint program of the University of Pittsburgh School of Medicine's Department of Surgery, the McGowan Institute, and Children's Hospital of Pittsburgh of UPMC.

Prior to this, Dr. Fox served as Senior Associate Dean for Research and Development at the University of Nebraska College of Medicine as well as the Charles W. McLaughlin Professor of Surgery (and Pathology and Microbiology) at the University of Nebraska Medical Center.

Research Interests

- Bench-to-bedside study of experimental therapies for liver disease, including liver assist devices, liver cell transplantation, and liver stem cells.
- Biologic and Immunologic barriers to successful transplantation of primary and xenogenic hepatocytes.
- Conditionally-immortalized rodent and human hepatocytes.
- Differentiation of mouse and human embryonic stem (ES cells) and inducible pluripotent stem (iPS cells) cells into liver cells.

Publications

1. Dhawan A, Strom SC, Sokal E, Fox IJ.  


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