Targeted Treatment for Acute and Chronic Kidney Disease Using Low Molecular Weight Proteins

Brief Description of Technology
Low molecular weight proteins conjugated to therapeutic agents are delivered to the proximal tubule for localized treatment of acute and progressive renal disease.

Technology Overview
Chronic kidney disease (CKD) is characterized by progressive loss of kidney function, while acute kidney injury (AKI) is sudden loss of kidney function. While most patients will recover from AKI, there is an increased risk for CKD, which affects more than 20 million American adults. The primary site for many forms of acute and progressive kidney disease is the proximal tubule; however, no current therapies specifically target this location. Dr. Zager and Dr. Strong are investigating low molecular weight proteins (LMWPs) for this application. LMWPs have been shown to be filtered and endocytosed to the proximal tubule thus allowing for site specific delivery of therapeutics. LMWPs can serve as independent cytoprotective proteins and can also be conjugated to therapeutic agents to deliver targeted treatment.

Applications
- Treatment for renal diseases

Advantages
- Therapeutics can target primary disease site

Market Overview
The overall prevalence of CKD in the US is approximately 14% with the main causes being high blood pressure and diabetes. The US market in kidney treatment could reach $45.6 billion by 2021 with a 5-year CAGR (2016-2021) of 3%, with acute kidney injury treatment increasing the fastest at 5.1% and CKD treatments growing by 2.8% during this time period. In the US, Medicare spending for CKD patients over 65 exceeded $50 billion in 2013 and represented 20% of all Medicare spending in this age group.

Investigator Overview
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