POTENTIAL USE OF INSULIN SENSITIZING AGENTS IN THE TREATMENT OF POLYCYSTIC KIDNEY DISEASE
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Industry Sector(s): Healthcare
Product Category: Medical Laboratories & Research

Opportunity Overview

The autosomal dominant form of PKD (ADPKD) is the most common renal genetic disease in humans with an estimated incidence of approximately 1 in 800. Cyst aspiration and renal transplantation are the only currently approved treatments for PKD. There are no pharmaceutical agents that are approved to mitigate the progressive cyst growth in PKD. Several agents are in clinical trials but each of these has associated side effects that may compromise life-long therapy. There is an unmet need for safe therapeutic agents that will be effective in preventing or reversing cyst expansion. We therefore propose proof-of-concept clinical trials in ADPKD patients to prove the efficacy of these agents in humans.

Markets & Applications

A variety of FDA approved PPARγ-agonists, insulin sensitizing drugs used in diabetes therapy, may be effective in the long-term treatment of PKD. There are relatively few side effects reported for this class of drugs when used at low concentrations, with fluid retention being the major potential side effect.

Competitive Advantage/Value Propositions

Pre-clinical testing was completed for two PPARγ-agonists, pioglitazone and rosiglitazone, to determine if these were effective in slowing cyst growth, and to assess if this was observed for doses lower than those used in the treatment of diabetes.
Results indicate that both drugs were effective as inhibitors of cyst growth. Furthermore, in one of the studies a very low dose of rosiglitazone (0.04 mg/kg BW) is effective in slowing cyst growth and all of the preclinical data suggest that pioglitazone will show the same result. With the very low doses, patients would be unlikely to exhibit fluid retention that is the major side-effect of this class of drugs.

Bonnie Blazer-Yost, Ph. D.
Dr. Blazer-Yost received her B.A. in chemistry from Lebanon Valley College, a small liberal arts college in central Pennsylvania. After working for several years in the Division of Metabolic Diseases at Children’s Hospital of Philadelphia, she entered the Ph.D. program at the University of Pennsylvania. After finishing her Ph.D., she did a two year post-doctoral fellowship at Cambridge University in England. Dr. Blazer-Yost joined the faculty of the Biology Department at Indiana University – Purdue University Indianapolis as an assistant professor in 1993 with joint appointments in the Departments of Anatomy and Physiology in the Indiana University School of Medicine. She rose through the ranks becoming a Full Professor in 2007. Dr. Blazer-Yost’s research interest from the time of her Ph.D. research to the present has been focused on understanding how the kidney regulates salt and water balance in the body. Her original work helped elucidate the intracellular signaling pathways involved in hormonal regulation of salt balance with an emphasis on the factors that cause an increase in blood pressure. Currently the research in her laboratory is focused on developing pharmaceutical agents that could be used to treat polycystic kidney disease (PKD). PKD, the most common genetic disease of the kidney, results in renal failure by age 55 in approximately 50% of the people who have the disease. Despite a high prevalence in the population (greater than 1 in 1000), there are currently no FDA approved drugs to treat PKD. The Blazer-Yost laboratory is testing the possibility of re-purposing an FDA approved anti-diabetic drug that has shown great promise in pre-clinical studies. The positive preclinical studies in rodent models of PKD as well as the relatively benign side effect profile of the potential drug make it an ideal candidate for proof-of-principle human trials.

Development Plans/Needs

1. Identifying potential partners for commercial development.
2. Next stage clinical testing.