Potential Novel Therapeutic Targets Fibrosis

Millions of people suffer from fibrotic disease. Fibrosis occurs when the body’s production of scar tissue is uncontrolled, leading to excessive tissue deposits that can result in organ failure. These conditions are largely resistant to treatment, and current therapies have many adverse side effects, taking a significant toll on patients, their families, and health-care spending.

The Solution

University of Michigan’s Daniel A. Lawrence, Ph.D., is developing a drug to inhibit the growth of a fibrotic matrix and significantly improve treatment options in a number of clinically important settings, including fibrotic diseases of the lung, kidney, and heart. He is specifically targeting Plasminogen Activator Inhibitor-1 (PAI-1), a protein that acts as the principal inhibitor of proteins involved in the breakdown of blood clots and in the resolution of the fibrotic matrix.

Developing effective small molecule PAI-1 inhibitors as a therapeutic agent presents a challenge because of the complexity of the PAI-1 mechanism and its relative instability. To address these issues, Dr. Lawrence developed a unique screening platform that has identified lead compounds that inhibit PAI-1 in complex environments like blood and tissues.
Potential new therapeutic inhibits protein to improve treatment of fibrotic diseases.

**Significant Need**
Fibrosis is a major global disease burden, affecting people around the world and costing billions of dollars. It is associated with many disease processes, including diseases such as Idiopathic Pulmonary Fibrosis (IPF), a serious lung disease characterized by scar tissue formation in the lung caused by fibrosis. IPF restricts the transfer of oxygen from inhaled air into the bloodstream, and there is no effective therapeutic treatment except lung transplant.

**Compelling Science**
There is a strong correlation of high PAI-1 expression with fibrotic disease in humans. A new drug that inhibits PAI-1 and has been demonstrated to prevent the growth of a fibrotic matrix in animal models could be an effective approach to treating a wide variety of diseases where fibrosis is a significant component.

**Competitive Advantage**
A unique screening platform identifies lead compounds that inhibit PAI-1, something that has proven unsuccessful in the past due to the relative instability of PAI-1 and the complexity of its inhibitory mechanism.

**MTRAC Project Key Milestones**
- Complete PK analysis and thrombotic stroke efficacy studies
- Identify collaborator with pharmaceutical development experience
- Complete pulmonary fibrosis studies
- Demonstrate oral efficacy
- Negotiate to license technology from U-M to MedigenixBio, Inc.
- Complete toxicology studies
- Publish preclinical studies

**Product Launch Strategy**
MTRAC funding has enabled us to continue our studies and test compounds that inhibit PAI-1 in fibrotic disease models. Our goal is to generate the data we need in order to advance this project to the point where we can obtain a license for this technology from the University of Michigan and move the project to our start-up company, MedigenixBio, Inc.

**Overall Commercialization**
- **Commercialization Strategy**
  - Obtain license from U-M and launch MedigenixBio, Inc.
- **Intellectual Property**
  - Several issued and pending patent applications.
- **Regulatory Pathway**
  - IND submission and clinical trial planned.
- **Engage Investors**
  - Plan to license to MedigenixBio, Inc. Possible SBIR/STTR funding from NIH, as well as venture funding.

**Daniel A. Lawrence, Ph.D.**

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