New Class of Tissue-Targeting Agents Inhibits Fibrosis, Inflammation, and Cancer Growth

A 1,000x more potent idiopathic pulmonary fibrosis (IPF) treatment than currently available

These macrocycle-based compounds have been specifically developed by Georgia Tech researchers to inhibit fibrosis, inflammation, and cancer growth. It is anticipated that these agents can be used for sustained targeting of specific tissues at these types of disease sites and will minimize or avoid toxicity to non-targeted cells from systemic exposure.

Candidate compositions, which were developed for the treatment of idiopathic pulmonary fibrosis (IPF), have proven to be 1,000 times more potent than pirfenidone, the current standard treatment for IPF.

The compounds can be administered via parenteral, enteral, transdermal, or transmucosal routes or by using bio-erodible inserts. It is also possible to formulate dosages for each route of administration.

Summary Bullets

- **Potent**: Candidates among these agents are 1,000 times more potent than pirfenidone, the standard treatment of IPF.
- **Specific**: The compounds may potentially exhibit tissue-targeting properties for sustained levels at disease sites.
- **Minimal toxicity**: Enhanced tissue specificity inhibits inflammation and growth of targeted cancer cells while minimizing off-target effects and toxicity.

Solution Advantages

- **Potent**: Candidates among these agents are 1,000 times more potent than pirfenidone, the standard treatment of IPF.
- **Specific**: The compounds may potentially exhibit tissue-targeting properties for sustained levels at disease sites.
- **Minimal toxicity**: Enhanced tissue specificity inhibits inflammation and growth of targeted cancer cells while minimizing off-target effects and toxicity.
- **Novel**: This innovation includes newly developed molecular compositions critical for pharmaceutical companies.

- **Versatile delivery**: A number of delivery methods and timed releases can be used depending on the specific active agent.

Potential Commercial Applications

- Treatment of fibrotic disease such as IPF
- Inflammatory disease treatment
- Cancer treatment

Background and More Information

Idiopathic pulmonary fibrosis is a chronic and fatal disease that progressively diminishes lung function. It is the most common interstitial lung disease (ILD), affecting 50 out of every 100,000 people worldwide. In the United States, about 100,000 people are affected by IPF, and approximately 30,000 to 40,000 new cases are diagnosed annually.

The cause of IPF is ambiguous, and the prognosis is the worst among ILD, with a median survival rate of 2 to 5 years. IPF patients have only a 28 percent chance of surviving 5 years, which is much lower than the survival rate for many other cancers.

In addition to addressing the unmet medical need for potent drugs to treat IPF, these macrolide-derived agents inhibit intracellular markers of fibrosis and inflammation and are cytotoxic to selected cancer cell lines.

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Publications

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