



OFFICE OF TECHNOLOGY TRANSFER



McGill

TECHNOLOGY OPPORTUNITY

Inflammation and Lipid Imbalance in CF

McGill University is seeking a company interested in commercializing fenretinide, a semi-synthetic retinoid, for the treatment of Cystic Fibrosis (CF). CF is an autosomal recessive disease with an incidence of 1 in 3,500 live births in North America and Europe. The prevalence is in the order of 30,000 in North America and 20,000 in Europe, which qualifies CF as an orphan disease. The CF market is estimated at approximately \$1.25 billion due to the variety of treatments required by CF patients. Currently no cure and no effective treatments are available for CF. CF patients consistently exhibit imbalance of DHA and AA stemming from altered fatty acid metabolism; they also present altered bone metabolism resulting in early osteopenia and osteoporosis. DHA and AA play a key role in regulating cell function, membrane fluidity, trafficking, inflammation and mucin secretion. Fenretinide restores the lipid ratio of AA/DHA in CF-affected organs, helps with treatment of *Pseudomonas* infections and prevents osteoporosis in CF patients.

Applications

Prevention and treatment of *Pseudomonas* induced-lung infections and prevention of osteoporosis in Cystic Fibrosis patients.

Advantages

- Fenretinide offers a novel treatment approach normalizing lipid imbalance resulting in decreased inflammation, diminished bacterial burden and reduced osteoporosis.
- Fenretinide therapy decreases bacterial burden and progression of pulmonary infection which could reduce the antibiotics use and the number and duration of hospital stays.
- Fenretinide improves bone morphogenesis through better nutrient absorption thus reducing the risk of CF-associated juvenile osteoporosis and offers patients a higher quality of life.

Technology

Patients affected with CF display a severe lipid imbalance between omega-6 fatty acids (AA) and omega-3 fatty acids (DHA), which is believed to contribute to the severity of CF lung disease and CF-related pathologies. This invention is based on the discovery that fenretinide helps correct this documented imbalance and this results in reduction in the frequency and severity of pulmonary infections and delay in the occurrence of osteoporosis. The median survival age of patients diagnosed with CF is 37 years and they are mainly treated with mucolytics, pancreatic enzymes, antibiotics and vitamin supplements as no effective treatment has yet been found. Both CF patients and their families must face the long term effects of this disease that has major implications on quality of life. Fenretinide would be a novel approach and a unique therapeutic alternative for CF patients .

The Inventors



Dr. Danuta Radzioch is Professor in the Department of Human Genetics and Medicine and a Medical Scientist in the Faculty of Medicine, of McGill University. She received her PhD in Biochemistry and Molecular Biology from Jagiellonian University in Poland. Dr. Radzioch's research focuses on the regulation of lung inflammation in CF and asthma, the genetics of asthma and the molecular mechanisms of macrophage activation.



Dr. Stanley Kubow is Associate Professor in the School of Dietetics and Human Nutrition at the Macdonald Campus of McGill University. He obtained his PhD in Nutritional Biochemistry from the University of Guelph . Dr. Kubow's research interests are the isolation and generation of bioactive components from foods and the role of nutraceutical, functional food and antioxidant supplementation on oxidative stress and inflammation in diabetes, cystic fibrosis, hyperlipidemia, cancer, fetal development and AIDS.

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