



OFFICE OF TECHNOLOGY TRANSFER



McGill

TECHNOLOGY OPPORTUNITY

## Novel Treatment for ALS and Acute SCI

McGill University is seeking a company interested in commercializing fenretinide, a semi-synthetic retinoid for the treatment of acute spinal cord injury (SCI) and amyotrophic lateral sclerosis (ALS). Worldwide, there are over 20,000 new cases of SCI per year with a large portion of patients surviving more than 5 years requiring lifelong treatment that can exceed costs of \$1,000,000. ALS affects 120,000 people each year worldwide and of these only 20% survive 5 years. Common to these conditions, is the absence of cure or effective medication, although riluzole has recently been approved for treatment of ALS, reduced quality of life (QOL) and progressively diminishing autonomy.

### Applications

Treatment of acute spinal cord injury and amyotrophic lateral sclerosis.

### Advantages

- Fenretinide treatment reduces inflammation-induced excessive oxidative stress resulting in :
  - reduced tissue damage and paralysis and
  - improved locomotor recovery in acute SCI
  - delayed disease onset and
  - improved motor function and survival in ALS.

## Technology

It has been well established that after acute SCI there is increased oxidative stress that is associated with a strong inflammatory response of the tissues in close proximity to the damaged tissue. This primary insult triggers a cascade of pathological events, known as secondary injury, resulting in further tissue damage and functional impairments due to the death of neurons and glial cells and to the disruption of the axonal pathways. The inflammatory response contributes strongly to secondary damage after SCI by releasing cytokines, free radicals, eicosanoids and proteases, amongst other molecules. Using a spinal cord contusion injury mouse model we observed a significant reduction in tissue loss, improved neuron survival, enhancement of motor skills, a decrease in AA and an increase in DHA levels after fenretinide treatment as compared to vehicle-treated animals.

ALS is a neurodegenerative disorder that is also associated with elevated levels of reactive oxygen species and excessive inflammation leading to neural cell damage. We used two mouse models of ALS (SOD1<sup>G93A</sup> and SOD1<sup>G37R</sup> transgenic mice) to test the efficacy of fenretinide in ALS. Fenretinide treatment improved significantly motor performance and survival in SOD1<sup>G93A</sup> transgenic mice as compared to vehicle-treated animals along with an increase in DHA levels and a decrease in AA levels.

## 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.

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Reference code: ROI 08049  
Opportunity: Exclusive license or research collaboration



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