

Azulenyl Nitrones

Compounds for the Treatment of Ischemic Injury Associated with Stroke and other Neurological Trauma

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Inventor

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Field

Ischemic injury due to stroke
and other neurological
trauma

Technology

Free radical scavengers

Key Features

- High solubility
- Crosses blood-brain barrier
- Good oxidation potential under physiological conditions
- Facile synthesis

Key Benefits

- Potential to reverse ischemic damage
- Potential for broader poststroke usage than t-PA
- Low toxicity

Stage of Development

- Thoroughly characterized
- Toxicology studies

Status

Seeking development & licensing partner.

Patent Status

US 6,083,988 B1 (7/4/2000)
US 6,197,825 B1 (3/6/2001)
US 6,291,702 B1 (9/18/2001)

Potential Therapeutics for Reversing Ischemic Injury

Reactive oxygen species have been linked to the ischemic trauma that occurs in stroke, head injuries, and other neurological trauma. Therefore free radical scavengers that operated within physiological conditions have potential to reverse the damage caused by ischemia. Azulenyl nitrones are a novel class of free radical scavenger compounds (or spin trapping agents) that have favorable characteristics for the treatment of ischemic injury – high solubility, permeability across the blood brain barrier, and an oxidation potential lying within physiologic range. Initial preclinical data indicates azulenyl nitronone compounds could play a therapeutic role in combating ischemic injury associated with stroke and other neurological trauma.

Need for Improved Post-Stroke Therapeutics

Twenty-five to sixty percent of stroke victims experience mild to severe disability, and there exists a need for improved methods of treating the damage secondary to the ischemic event experienced by these patients. While intravenous thrombolytic treatments such as tissue plasminogen activator (t-PA) have shown promise, they generally require intervention within three hours of a stroke. The compounds of the present inventions have the potential to reverse ischemic damage long after this three-hour time window has passed.

Market

Stroke is the major therapeutic target for the azulenyl nitronone compounds of the present inventions. Approximately 700,000 strokes occur every year in the U.S. and 2 million worldwide. It is estimated that ischemic stroke accounts for 88% of all strokes. It is anticipated that the number of strokes will increase by approximately 50% over the next 20 years then decline after 2025 (American Heart and Stroke). While the market for anticoagulants used in stroke prevention is large (estimated at \$20 billion in 2004 according to IMS Global), the current market for post-stroke therapeutics is significantly smaller and served predominantly by t-PA. Although Genentech's sales of t-PA have continued to grow over the years, by 2006 annual sales had only reached \$243 million. The narrow time-window for the efficacious use of t-PA and other limitations on patient selection due to the risk of inducing hemorrhagic stroke have hampered the market potential for this therapeutic. Therefore, the need still exists for a post-stroke therapeutic that has efficacy past the three hour time point without limitations on patient selection due to safety issues. Since only 2-3% of all stroke victims are treated with t-PA, the market potential of a more broadly applicable drug is quite significant.

Opportunity

Florida International University is looking for a commercialization partner to facilitate further development of these compounds.