

## **MultiStem in Acute Stroke to Enhance Recovery Study (MASTERS): A Phase I, Dose Escalation, Placebo Controlled Clinical Trial Using MultiStem® for Treatment of Patients Suffering an Acute Ischemic Stroke**

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Stroke is the third leading cause of death and the leading cause of disability in the U.S. In 2008, approximately 780,000 Americans suffered a stroke with total associated costs estimated at \$65B. The mean lifetime cost following ischemic stroke of a single patient in the U.S. is projected as ~\$150,000 including inpatient treatment, rehabilitation and follow-up care necessary for lasting defects. Current therapy for stroke is severely limited; other than one protein therapy, tissue plasminogen activator (tPA), no approved specific treatment is available. Only ~5% of Americans suffering ischemic stroke who would benefit actually receive tPA due to delayed recognition of the symptoms coupled with the limited window for receiving treatment. This means ~610,000 Americans suffered an ischemic stroke in 2008 that could have benefited from an effective alternative cellular therapy. The number of affected individuals, the costs necessary to facilitate care and rehabilitation, and lack of current therapies reiterate that stroke represents a current significant unmet medical need.

Athersys has developed MultiStem, a proprietary adult adherent stem cell clinical product, under strict specifications and release criteria approved by the FDA. Athersys has established the efficacy of MultiStem in multiple pre-clinical animal disease models including ischemic stroke, Hypoxic-Ischemic (HI) Injury, acute myocardial infarct (AMI), and Graft vs. Host Disease (GVHD). Subsequently, Athersys has undertaken safety profiling of MultiStem in multiple pre-clinical animal studies including, GLP tumorigenicity studies in NOD-SCID and nude mice, GLP safety studies in stroke injured rats, and long term safety (>1 year) studies in stroke injured and HI injured rats. As a result, the FDA has approved the manufacturing and basic safety profile of MultiStem for use in humans in the treatment of ischemic stroke, AMI and GVHD, and Athersys has successfully initiated patient enrollment and treatment using MultiStem in AMI and GVHD patients.

Our Phase I clinical stroke design is a randomized, double-blind, placebo controlled, multicenter, dose escalation study. The primary objective is to determine the maximum tolerated dose of MultiStem from administration of a single intravenous dose. Secondary endpoints include determining the long term safety of the cells, gathering preliminary data on functional outcomes including exploratory MRI to correlate outcome with imaging in MultiStem treated patients. This study represents an initial step in developing a new class of therapy for treatment of ischemic stroke.