



# WINN FELINE FOUNDATION

For the Health and Well-being of All Cats

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MT 12-003

Longitudinal evaluation of effects of mesenchymal stem cells in feline chronic allergic asthma:  
Phase II

Asthma is a common inflammatory lower airway disease affecting cats. Feline asthma is characterized by inflammation and constriction of the airways causing difficulty breathing. Long term, these result in remodeling of the airways causing permanent declines in lung function. With declines in lung function, patients are less responsive to standard therapy. Currently, there is no approved therapy that is consistently able to slow or reverse this remodeling. Mesenchymal stem cells have been shown in rodent models to slow or prevent airway remodeling.

The overall study objectives were to document long term decreases in airway inflammation, airflow limitation, and remodeling in cases of feline chronic allergic asthma using mesenchymal stem cells. This grant funded a portion of the study, that looking at the long term effects of adipose-derived mesenchymal stem cells (MSCs) on airway remodeling using CT scans in a chronic experimental model of feline asthma. The investigators hypothesized that longitudinal evaluation of asthmatic cats administered intravenous allogeneic MSCs would demonstrate decreased airway remodeling compared with cats receiving placebo.

Changes in airway remodeling were assessed at months 8 and 12 after initiation of stem cell infusions using thoracic computed tomographic (CT) scans. Specifically, they evaluated the thickness of the walls of the lower airways (bronchial wall thickening) and the overall density of the tissues (lung attenuation). With asthma an increase in the thickness of the lower airways and density of the tissues is seen due to infiltration of inflammatory cells and chronic scarring.

Interestingly, there was significant improvement in airway remodeling noted at month 8 in the cats receiving stem cell compared with placebo therapy. The MSC-treated cats had significantly less thickening of the walls of their lower airways. In addition, the density of the tissues in MSC-treated cats was significantly less than that observed in placebo-treated cats. This effect was not observed at month 12. Thus, the effect of MSC therapy is likely not sustained long term and repeated infusions over time may be needed. Overall, this study provides exciting evidence to indicate that MSC infusion may be beneficial in blunting the changes in airway remodeling that is noted in chronic asthma.

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