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Abstract

Cachexia is a state of excessive loss of weight, specifically characterized by loss of lean body weight including muscle mass, bone density, and fat. In cardiac cachexia, patients experience this excessive weight loss secondary to congestive heart failure due to a complex interplay of decreased appetite resulting in decreased caloric intake, excessive inflammation throughout the body, and chronic activation of their sympathetic nervous system ("fight or flight" response) in order to compensate for poor heart function. Cardiac cachexia has been shown in both humans and dogs to negatively affect quality of life by decreasing immune function, decreasing physical strength, and causing an overall poorer quality of life. In canine patients specifically, the presence of cardiac cachexia has also been a strong factor in the owner's decision to pursue euthanasia. Current treatment options for cardiac cachexia are limited to supportive care including nutritional support with calorie-rich diets and supplements, physical therapy to support remaining muscle mass, and management of underlying congestive heart failure. Unfortunately, these management strategies only result in minimal improvement and/or slowing of lean body mass wasting. Therefore, newer, specific treatment methods focused on targeting the disease process of cachexia itself are necessary to provide affected patients with an improved quality of life and potentially improve their lifespan secondary to adjustments in euthanasia decisions. Targeted gene therapy is one such potential treatment option that offers the specificity needed to directly interfere with the cachexia disease process. This treatment would involve the inhibition of specific proteins involved in propagating the disease and/or upregulating proteins that counteract the wasting that occurs with cachexia. In order for gene delivery to be effective, identification of the most affected proteins in this disease process is necessary to determine the best target for gene therapy in these patients. The investigators will collect blood samples from canine patients with cardiac cachexia. Concentration of circulating candidate proteins will be evaluated by western blot (student role) to determine which proteins have the greatest potential as gene therapy targets in future clinical trials. It is expected that initial results will help guide future targeted gene therapy treatments for patients in congestive heart failure with cardiac cachexia to improve the quality of life for these patients.