TECHNICAL ABSTRACT

Background: Trauma to the head or eye causes oxidative stress and neuronal cell loss. Supplementation with VitC, VitE, or ketone bodies, as are produced in a high-fat, low-carbohydrate (i.e., ketogenic) diet, is effective at blocking oxidative stress and neuronal deficits in multiple models of neurodegenerative diseases. We have data that indicate VitC is protective in our eye blast model. Therefore, there is good rationale for testing the efficacy of these compounds for the treatment of vision loss due to eye blast.

Objective/Hypothesis: We hypothesize that blocking blast-induced oxidative stress will preserve vision.

Specific Aims: Specific Aim 1: To test the hypothesis that blast-induced oxidative stress, cell death and vision loss after eye blast can be prevented by treatment with VitC and VitE. Specific Aim 2: To test the hypothesis that blast-induced oxidative stress, cell death, and vision loss after closed globe blast injury, which can be prevented by consuming a ketogenic diet.

Study Design: Aim 1: Mice that, like humans, are unable to synthesize VitC will be maintained on a high or low