URC Abstract Proposal:
Exercise is Anxiogenic Before It Is Anxiolytic
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The purpose of this study was to investigate the relationship between the duration of voluntary exercise and anxiety-like behavior in rats. Previous research has suggested that 6, but not 3, weeks of running wheel exposure reduces anxiety-like behavior in rats. We sought to determine what happens to anxiety-like behavior each week during the course of 7 weeks of running wheel exposure. Male Wistar rats were used as subjects for this study. Half of the rats (n=16) were given access to a running wheel in their home cage for 7 weeks. The other half were housed in standard cages. Once per week, exercising and non-exercising rats were given an acoustic startle test. This test involves presentations of brief, startle-eliciting noise bursts and measurement of the whole body startle response. Exercising rats showed an increased startle response at weeks 2 and 5 of exercise, suggesting greater, not less, anxiety at these two time points. Rats were also tested after 1 or 7 weeks of exercise in the elevated plus maze (EPM), a second measure of rodent anxiety-like behavior. The EPM consists of four arms in a cross-shape elevated several feet above the floor. Two arms ("closed arms") have high walls and the other two arms ("open arms") have no walls. Non-anxious rats spend more time in the open arms (where they are vulnerable) than anxious rats. After 7 weeks of exercise, performance of exercising rats was consistent with less anxiety, as in previous studies. This is the first study to suggest that exercise can increase, as well as decrease, anxiety. This work has both practical implications (e.g., exercise program adherence) as well as implications for interpretation of neurobiological data related to exercise.