WRIGHT STATE UNIVERSITY | BIOMEDICAL SCIENCES PhD PROGRAM

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DISSERTATION DEFENSE

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PhD Candidate

"Biomarker-Performance Associations during Nutritional and Exercise Intervention in Air Force"

Friday, March 15th, 2019

12:30 p.m.

022 Oelman Hall

Advisor: Erica Johnson, PhD
WPAFB

Jurcsisn, Jennifer, Biomedical Sciences PhD Program
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This study evaluated the synergistic effects of an exercise intervention and nutritional supplement on biomarkers of stress and resilience, and the relationships of those markers with physical and cognitive performance. 130 healthy Active-Duty Air Force (AF) personnel were recruited to participate in a double-blind, placebo controlled 12-week exercise and nutritional intervention. Serum was collected at basal and stress conditions pre and post intervention to track the following biomarkers: cortisol, dehydroepiandrosterone-sulfate (DHEA-S), norepinephrine (NE), neuropeptide Y (NPY), and serotonin. The exercise intervention significantly decreased NPY levels and attenuated the cortisol response and peak stress cortisol levels. The nutritional intervention increased resting DHEA-S and decreased peak stress NE. The selected biomarkers were not universally correlated with performance measures. NPY, NE, and cortisol levels showed strong relationships with several dimensions of physical performance during stress, though resting NPY and NE levels did not. Few correlations were observed between biomarkers and cognitive performance. We conclude that these interventions had mixed and modest effects on biomarker levels of stress and resilience and that their relationships with performance is dependent on task type and stress condition. For future research, we recommend measuring additional biomarkers and tailoring interventions to the individual subject for greater efficacy.