

# KINESIOLOGY: EXERCISE PHYSIOLOGY, MS

This is a named option in the Kinesiology, MS. (<https://guide.wisc.edu/graduate/kinesiology/kinesiology-ms/>) For more information, please see our program website (<https://kinesiology.education.wisc.edu/academics/grad-program/>).

Exercise Physiology is the study of the biological responses and adaptations to acute and chronic exercise. Research and graduate training at UW-Madison focuses on elucidating: 1) the physiological, biochemical, and molecular mechanisms underlying these processes; and 2) the influence of exercise on health and disease.

Dr. Diffie studies the regulation of contraction in skeletal and cardiac muscle and how this regulation is altered by perturbations such as exercise training, injury, or disease. Typical experiments involve measurement of contractile properties single skeletal muscle fibers and single cardiac myocytes and correlation of altered mechanical properties to changes in cell protein composition detected by biochemical and molecular biological techniques. Interaction with faculty and students from other departments (including Nutritional Sciences, Biochemistry, the School of Medicine, and the Institute on Aging) is encouraged by ongoing collaborative research efforts. The research of William Schrage's laboratory is focused on how blood flow is regulated in muscle and brain circulations. Specifically, Dr. Schrage is interested in how acute exercise or environmental stress like hypoxia influences blood flow and how this is impacted by obesity and metabolic syndrome. He measures blood flow using state-of-the-art technology including ultrasound and MRI. A key approach is to use pharmacologic tools to understand how blood flow is controlled, and how obesity changes which mechanisms change the ability to regulate blood flow under stress. Dr. Barnes focuses on how aging and exercise alter blood flow and blood pressure regulation. Her current projects focus on age-associated changes in cerebral blood flow, the sympathetic nervous system activity influences cerebral blood flow, and how these relate to the risk of cardiovascular disease and dementia.

The Exercise Physiology named option of the MS program is designed to provide the fundamental framework for understanding and conducting research in Exercise Physiology. In addition to coursework in Physiology, Statistics, and Research Methods, students pursue advanced study in Exercise Physiology. Many MS students have the opportunity to teach during their training. Graduates of the MS program often pursue further graduate training, usually in a PhD, MD or DO program. Other MS graduates immediately pursue a career in research, educational, or clinical settings.