Human Physiology

The mission of the Department of Human Physiology at Gonzaga is to foster undergraduate education, scientific research, and dissemination of information in the physiological and biomedical sciences. We value the aspirations, individuality, and success of our students, faculty, and staff who work and learn here. We value academic freedom, creative expression, the pursuit of excellence, and the discernment that stems from logic and reason. We value our shared responsibility to steward resources sustainably and responsibly. We aspire to be a preeminent and innovative undergraduate program in the physiological sciences. We seek to enrich the lives of others through teaching, mentoring, scholarship, experiential learning, creative inquiry, and scientific discovery.

THE PROGRAM

Human physiology is the science of the mechanical, physical, and biochemical functions of humans, and serves as the foundation of modern medicine. As a discipline, it connects science, medicine, performance, and health to create a framework for understanding how the human body adapts to stress, physical activity, and disease.

The Bachelor of Science in Human Physiology degree is for students who plan to pursue advanced degrees in the health professions and biomedical sciences. The basic, foundational principle for the study of human physiology is the maintenance of homeostasis through the operation of complex control systems. These systems encompass all levels of the hierarchy of human structure and function (i.e. cells, tissues, organs, organs systems, and the organism). Each course in the curriculum emphasizes an integrated study of humans across this hierarchy of structure and function. Consequently, a reductionist approach that separates the curriculum into specific courses such as "molecular physiology," "cell physiology," "histology," or "organ physiology," has been purposely avoided. Topics covered across the curriculum include:

- General Physiological Concepts - body organization, homeostasis, control systems, biochemistry, cell structure, cell function, histology, metabolism, membranes, and cellular communication
- Systems Physiology - neurophysiology, muscular physiology, cardiovascular physiology, respiratory physiology, renal physiology, fluid and acid-base physiology, digestive physiology, endocrinology, immunology, and reproductive physiology
- Integrative Physiology - exercise physiology, environmental physiology, physiology of aging, biomechanics, and nutrition

The Human Physiology major, along with selected electives from other departments across the University, provides students with preparation for graduate or professional study in a variety of fields. Human Physiology majors express interest in pursuing various careers, such as:

- physiologist
- physician
- physician's assistant
- physical therapist
- occupational therapist
- research scientist
- sports medicine
- pharmacist
- public health
- dentist
- chiropractor
- nursing

The program uniquely emphasizes the scientific basis and mechanisms of human function, adaptation, aging, health and disease, and performance.
STUDENT RESEARCH PROJECTS
As a part of independent studies and/or requirements for upper-division courses, students complete novel research studies, some of which are accepted for publication and/or presentation at regional and national scientific meetings. The following are examples of student/faculty research that have been accepted for presentation or publication:


**GRADUATE SCHOOLS**

**Biomedical Sciences**
- Creighton University

**Biomechanics**
- University of Alberta-Calgary
- University of Oregon
- University of Western Australia
- Cardiac Rehabilitation

**Chiropractic Medicine**
- Life Chiropractic College West
- Palmer College of Chiropractic

**Dental School**
- Oregon Health & Science University
- University of British Columbia

**Exercise Physiology**
- Baylor University
- Boise State University
- Central Washington University
- Long Beach State University
- Montana State University
- Northern Colorado University
- Oregon State University
- San Diego State University
- San Jose State University
- Springfield College
- University of Denver
- University of Oregon
- University of Utah
- Western Washington University

**Medical School**
- Creighton University
- Georgetown University
- Loma Linda University
- Medical College of Wisconsin
- Northwest Osteopathic Medical School
- Oregon Health & Science University
- Tulane University
- University of Colorado
- University of Nevada
- University of Southern California
- University of Vermont
- University of Washington
- Virginia Commonwealth University
- Wake Forest University

**Molecular Physiology**
- University of Vermont

**Neurophysiology**
- University of California, Davis

**Occupational Therapy**
- Belmont University
- Colorado State University
- Creighton University
- Eastern Washington University
- George Washington University
- Idaho State University
- Midwestern University (Phoenix, AZ)
- Nova Southeastern University
- Oregon State University
- Tufts University
- Tulane University
- University of Puget Sound
- University of Southern California
- University of Washington

**Optometry**
- Ferris State University
- Midwestern University
- Pacific University
- University of Michigan
- University of Southern California
- Western University of Health Sciences

**Physical Therapy**
- Chapman University
- Columbia University
- Creighton University
- Duke University
- Eastern Washington University
- Emory University
- George Washington University
- Northwestern University
- Old Dominion University
- Pacific University
- Regis University
- Sacred Heart University
- Samuel Merritt University
- St. Catherine University
- University of Illinois
- University of Maryland
- University of Minnesota
- University of Montana
- University of New England
- University of Pittsburgh
- University of Puget Sound
- University of St. Augustine
- University of Southern California
- University of Utah
- University of Washington
- Washington University in St. Louis

**Physician's Assistant**
- Midwestern University (Phoenix, AZ)
- University of New Mexico

**Public Health**
- George Washington University
- Oregon State University
- University of Washington
THE PEOPLE
Faculty in the Department of Human Physiology are scientists, teachers, and scholars whose academic and professional expertise is invaluable to Human Physiology students.

FACULTY CONTACTS, RESEARCH INTERESTS, & PUBLICATIONS

Brian K. Higginson | Dept. Chair
Ph.D., Oregon State University
Professor
Research Interests: biomechanics, ergonomics, and energetics of load carriage; kinematic and muscle adaptation during prolonged exercise (cross-country skiing and cycling); and physiological and biomechanical determinants of shooting performance in competitive shooters
higginson@gonzaga.edu

Manuscripts in peer-reviewed journals:

Patrick L. Crosswhite
Ph.D., University of Oklahoma
Assistant Professor
Research Interests: understanding the role of chromatin remodelers and how they impact blood pressure
crosswhite@gonzaga.edu

Manuscripts in peer-reviewed journals:

Daniel J. McCann
Ph.D., University of California, Davis
Professor
Research Interests: metabolism, exercise physiology, dimensional analysis, and environmental physiology
mccann@gonzaga.edu

Manuscripts in peer-reviewed journals:

Ryan S. McCulloch
Ph.D., University of North Carolina Chapel Hill; NC State University
Assistant Professor
Research Interests: biomechanics, orthopedics, prosthetics
mcculloch@gonzaga.edu

Manuscripts in peer-reviewed journals:

James McKenzie
Ph.D., Indiana University, Bloomington
Lecturer
Research Interests: exercise physiology, thermoregulation, environmental stress
mckenziej@gonzaga.edu

Manuscripts in peer-reviewed journals:

David Thorp
Ph.D., University of Western Ontario
Professor
Research Interests: the role of exercise in intracellular signaling and improvement of myocardial tolerance to ischemia, the human dive reflex, exercise and cognitive function
thorp@gonzaga.edu

Manuscripts in peer-reviewed journals:

Stephen B. Conant
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Senior Lab and Technical Specialist
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ACSM - Northwest Chapter Past President, ACSM National Health and Science Policy Committee, ACSM-certified Health/Fitness Specialist®, National Strength & Conditioning Association-Certified Strength & Conditioning Specialist.

Manuscripts in peer-reviewed journals: