



The Passion

The Bachelor of Science degree in Human Physiology from Gonzaga requires students to develop significant content knowledge, analytical thinking skills, knowledge of scientific principles and research, and an ability to communicate their knowledge to others. Gonzaga's Department of Human Physiology seeks to develop critical thinkers and scientists who are capable of graduate study in disciplines and professions grounded in the study of human anatomy and physiology.

The Program

Human physiology is the science of the mechanical, physical, and biochemical functions of humans, their organ systems, organs, and the cells of which they are composed. The basic principle that provides the foundation for the study of human physiology is the maintenance of homeostasis through the operation of complex control systems encompassing all levels of the hierarchy of human structure and function (i.e., cells, tissues, organs, organ systems, and the organism). Therefore, each course in our curriculum emphasizes an integrated study of humans across this hierarchy of structure and function. Consequently, a reductionist approach of separating the curriculum into specific courses such as "molecular physiology," "cell physiology," "histology," or "organ physiology," has been purposely avoided. Topics covered across the revised degree 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 B.S. in Human Physiology, along with selected electives from other departments across the University, provides students with preparation for graduate or professional study in a variety of fields, including health professions (physical therapy, occupational therapy, physician's assistant, cardiac rehabilitation, public health, dentistry, chiropractic, medicine, etc.), research and teaching, or careers in health and fitness.

The program is unique within the University because it emphasizes the scientific basis and mechanisms of human function, adaptation, development and aging, health and disease, and performance.

The Potential

Most Gonzaga students that have graduated from our program pursue graduate study and/or professional training. For example, seniors graduating from our department have been accepted to the following list of institutions for continued study:

Alternative Medicine

Western Washington University

Biomedical Sciences

Creighton University

Biomechanics

University of Alberta - Calgary
University of Oregon
University of Western Australia

Cardiac Rehabilitation

University of Oregon

Chiropractic Medicine

Life Chiropractic College West
Palmer College of Chiropractic

Dentistry

Oregon Health & Science University

Exercise Science/Physiology

Baylor University
Central Washington University
Marywood University
Montana State University
Northeastern University
University of Oregon
University of California, Davis
University of Vermont

Medicine

Creighton University

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Tulane University
University of Southern California
Medical College of Wisconsin
Wake Forest University

Nuclear Medicine

Swedish Hospital (Seattle)

Nursing

Linfield College
Seattle University
University of Utah

Occupational Therapy

Colorado State University
Eastern Washington University
Idaho State University
University of Puget Sound

Physical Therapy

Chapman University
Columbia University
Creighton University
Duke University
Eastern Washington University
Emory University
Northwestern University
Pacific University
Regis University
Samuel Merritt College
The College of St. Catherine
University of Montana
University of Pittsburgh
University of Puget Sound
University of Southern California
University of Washington
Wheeling Jesuit University
Washington University in St. Louis

Physician's Assistant

Midwestern University (Phoenix)
University of New Mexico
Emory University

Public Health

George Washington University
Oregon State University
University of Washington

Our graduates have also been employed in a variety of fields and organizations, including:

Coeur d'Alene Physical Therapy (Coeur d'Alene, ID)
In Motion Physical Therapy (Spokane, WA)
Performance Physical Therapy (Spokane, WA)

Holy Family Hospital Rehabilitation Services (Spokane, WA)
U.S. Army Institute of Environmental Medicine (Natick, MA)
Mayo Clinic Hospital (Phoenix, AZ)

Student Research Projects

As a part of independent studies and/or requirements for upper-division courses, our majors complete research projects, some of which are accepted for publication and/or presentation at regional and national scientific meetings. The following are examples of student-faculty research from the past few years:

M.P. Bejar, E.M. Johnson, A.M. Kluever, K.M. Payne, C.K. Robinson, A.J. Smith, W.L. Wenger, and D.M. McCann. "The effect of shod and barefoot conditions on running economy in trained females." ACSM Regional Meeting - poster presentation.

Geithner, C.A. and McKenney, D.R. "Strategies for aging well." *Strength and Conditioning Journal*, invited article.

Geithner, C.A., Albert, J.F., and McKenney, D.R. "Work-life imbalance, stress, and individual and organizational intervention strategies." *2008 Annual Review of High Performance Coaching and Consulting*.

Bracko, M.R., Haia, C.L.K., Fernandez, D.H., and Geithner, C.A. (2008). "Relationships between blood lactate clearance and measures of aerobic capacity in elite women's ice hockey players." ACSM Annual Meeting - poster presentation.

Fernandez, D.H., Geithner, C.A., Haia, C.L.K., and Bracko, M.R. (2008). "Prediction of skating performance using anthropometry and off-ice fitness tests in elite women's ice hockey." ACSM-Northwest Annual Meeting and ACSM Annual Meeting, Winter Sports Science Interest Group Thematic Poster Session - poster presentations.

Geithner, C.A., Fernandez, D.H., Haia, C.L.K., and Bracko, M.R. (2008). "Profiling of nationally ranked female ice hockey players by multidimensional performance and fitness characteristics." ACSM Annual Meeting - poster presentation.

Haia, C.L.K., Bracko, M.R., Fernandez, D.H., and Geithner, C.A. (2008). "Relationships between blood lactate and measures of anaerobic capacity in elite women's ice hockey." ACSM-Northwest Annual Meeting and ACSM Annual Meeting - poster presentations.

Campbell, B., L. Mall, J. Martin, K. Sanchez, S. Workland (2008). "Dynamic muscular endurance tests: standard vs. modified push-ups." Annual Conference, American College of Sports Medicine, Northwest, Seattle, WA.

Smith, D.S., G.M. Lundberg, D.M. Lemieux, A.E. O'Neil, and D.J. McCann (2008). "Effects of music on short-term anaerobic performance." Annual Conference, American College of Sports Medicine, Northwest, Seattle, WA

Vincent, J.A., Geithner, C.A., Cooper, M.F., Siegel, S.R., Weixel, C.A., and Windlin, E.M. (2007). "Growth and obesity status in American Indian and non-American Indian children." ACSM Annual Meeting - oral presentation. *Medicine & Science in Sports & Exercise* 39: S57.

Vincent, J.A., Geithner, C.A., Cooper, M.F., Weixel, C.A., and Windlin, E.M. (2006). "Fatness, fat patterning, and blood pressure: Relationships, prediction, and tracking in children." ACSM Annual Meeting - poster presentation. *Medicine & Science in Sports & Exercise* 38: S433.

Sears, S.P., Greer, L.B., Dorn, J.L., Neil, J.M., Wamre, M.L., and Zink, A.J. (2006). "Kinematic differences between shod and barefoot runners at a recreational pace." NWACSM Annual Conference - oral presentation.

Vincent, J.A., Geithner, C.A., Cooper, M.F., Siegel, S.R., Weixel, C.A., and Windlin, E.M. (2006). "Fatness, fat patterning, and blood pressure: Relationships, prediction, and tracking in children." NWACSM Annual Conference - poster presentation. Undergraduate Student Poster Award.

Vincent, J.A., Geithner, C.A., Smith, T., and Windlin, E.M. (2006). "BMI class, sex, and race differences in body image and nutrition choices in children." 23rd Pediatric Work Physiology Meeting, Gwatt, Switzerland - Poster presentation.

Ovitt, A.M., Geithner, C.A., and Bracko, M.R. (2005). "Physical and performance differences among forwards, defensemen, and goalies in elite women's ice hockey." ACSM Annual Meeting - thematic poster session. *Medicine & Science in Sports & Exercise* 37: S469.

The People

Christina A. Geithner, Ph.D., University of Texas-Austin; Research interests: overweight, obesity, and chronic disease risk in children and adults; barriers to and predictors of physical activity; talent identification in sport. ACSM-certified Health/Fitness Specialist®, YogaFit® certified Yoga Instructor. (geithner@gonzaga.edu)

Publications in peer reviewed journals: *American Journal of Lifestyle Medicine* (2011), *ACSM's Health & Fitness Journal* (2007, 2010, 2011), *International Journal of Environmental, Cultural, Economic, and Social Sustainability* (2006), *Journal of Strength and Conditioning Research* (2009, 2006), *Italian Journal of Sports Sciences* (2005), *Anthropologiai Közlemények* (2004), *Medicine & Science in Sports & Exercise* (2004), *Portuguese Journal of*

Sport Sciences (2003), *Annual Review of High Performance Coaching and Consulting* (2009).

Higginson, Brian K., Ph. D., Oregon State University; Research interests: Physiological and biomechanical determinants of shooting performance in competitive shooters, kinetic and kinematic adaptations to lifting tasks, influence of external load carriage on gait patterns and locomotion energetics. (higginson@gonzaga.edu)

Publications in peer reviewed journals: *Current Sports Medicine Reports* (2009, 2008), *Journal of Experimental Biology* (2007), *Journal of Applied Physiology* (2005), *European Journal of Applied Physiology* (2001, 2004), *Sport Biomechanics* (2004), *Journal of Exercise Physiology* (2003).

McCann, Daniel J., Ph. D., University of California-Davis; Research interests: metabolism, exercise physiology, dimensional analysis, environmental physiology. (mccann@gonzaga.edu)

Publications in peer reviewed journals: *Current Sports Medicine Reports* (2008), *International Journal of Sports Medicine* (2004), *Medicine & Science in Sports & Exercise* (2003, 2002, 1997, 1995), *Sports Medicine & Rehabilitation* (2001).

Thorp, David, Ph.D., University of Western Ontario. Research interests: The role of exercise training in intracellular signaling and improvement of myocardial tolerance to ischemia. (thorp@gonzaga.edu)

Publications in peer reviewed journals: *Cell Chaperones* (2008), *American Journal of Physiology: Heart and Circulatory Physiology* (2006, 2007), *American Journal of Physiology: Integrative and Comparative Physiology* (2007), *Journal of Molecular Cardiology* (2004), *Experimental Physiology* (2001).