
Melanie M. Richter

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Education

Ph.D., Biology, 2015

University of Alaska Fairbanks, Department of Biology and Wildlife,
Fairbanks, Alaska

Dissertation title: "Factors controlling the phenology and limits of hibernation in
a sciurid"

Advisors: Drs. Loren Buck and Brian Barnes

BSc. Biology and Zoology, 2007

Colorado State University, Fort Collins, CO

Undergraduate Research Advisor: Dr. Gregory Florant

Positions Held

Post-doctoral Researcher: May 15, 2016 to present

Western Kentucky University

Advisor: Dr. Noah Ashley

Research Technician 1, February 2015 to present

University of Alaska Anchorage, Anchorage AK

Advisor: Dr. Eric Bortz Lab

Teaching Assistant

Fall 2011: BIOL 103: Biology for Non-majors (Univ. of Alaska Anchorage)

Spring 2008: BIOL 116: Fundamentals of Biology II (Univ. of Alaska
Fairbanks)

Fall 2007: BIOL 260: Principals of Genetics (Univ. of Alaska Fairbanks)

Undergraduate Researcher, September 2005 – August 2007

Colorado State University, Fort Collins, CO

Dr. Greg Florant

Research Interests

My interests revolve around the molecular, physiological, and behavioral adaptations that enable animals to survive in changing, seasonal environments. I am interested in using integrative approaches to determine how animals have adapted to their current environments and how a changing world might affect the species.

My past research has investigated the effects environmental conditions have on patterns of torpor-arousal cycles, body condition, and circulating satiety hormone levels of a small, montane hibernator, the golden-mantled ground squirrel. My current work has concentrated on the phenology of male arctic ground squirrels, using both free-living individuals in the field and captive animals in laboratory studies. I have also investigated the lower ambient temperature limits of hibernation in arctic ground squirrels and golden-mantled ground squirrels and the corresponding metabolic rates required to sustain torpor at those temperatures. In the future I intend to expand my skills to include more molecular approaches to determine how adaptations enable survival on a more mechanistic basis. In particular I would like to investigate the up- and down-regulation of genes and proteins associated with cold acclimation and thermogenesis.

Research Presentations

- 2013 SICB Annual Meeting, San Francisco, CA (Talk)
- 2012 International Hibernation Symposium, Vienna, Austria (Talk)
- 2010 Society for Integrative and Comparative Biology Annual Meeting, Seattle WA (Poster)
- 2008 Experimental Biology, San Diego, CA (Poster)
- 2007 Colorado State University Undergraduate Research and Creativity Symposium, Fort Collins, CO (Poster)
- 2006 Annual Department of Biology Student Symposium, Fort Collins, CO (Poster)
- 2006 Colorado State University Undergraduate Research and Creativity Symposium, Fort Collins, CO (Poster)
- 2006 Front Range Neuroscience Group Annual Meeting, Fort Collins, CO (Poster)
- 2006 American Physiology Society Comparative Physiology Conference, Virginia Beach, VA (Poster)

Awards

- University of Alaska Fairbanks Institute of Arctic Biology (IAB) Graduate Summer Research Award, 2013 (\$30,000)
- University of Alaska Environmental and Natural Resources Institute (ENRI) Student Research Award 2013 (\$3,300)
- Alaska IDeA Network of Biomedical Research (INBRE) Student Travel grant for the annual Society of Integrative and Comparative Biology meeting, 2013 (\$2,000)

- International Hibernation Society Graduate Travel Grant 2012 (\$1,600)
- Received an INBRE Graduate Fellowship Fall 2010-Summer 2011 (\$29,000 + tuition and health insurance)
- Best undergraduate poster at the 12th Annual Colorado State Univ. Department of Biology Student Symposium, November, 2006.
- Colorado State University Biology Department travel award for American Physiological Society's Comparative Physiology Conference in Virginia Beach, Virginia, 2006. (\$400)

Publications

Richter, M. M., C. T. Williams, T. N. Lee, Ø. Tøien, G. L. Florant, B. M. Barnes and C. L. Buck (2015). "Thermogenic Capacity at Subzero Temperatures: How Low Can a Hibernator Go?" *Physiological and Biochemical Zoology*. 88:1 (81-89).

Sheriff, M. J., M. M. Richter, C. L. Buck and B. M. Barnes (2013). "Changing seasonality and phenological responses of free-living male arctic ground squirrels: the importance of sex." *Philosophical Transactions of the Royal Society B: Biological Sciences*. 368:1624.

Williams, C.T., Barnes, B.M., Richter, M., Buck, C.L. (2012). "Hibernation and Circadian Rhythms of Body Temperature in Free-Living Arctic Ground Squirrels". *Physiological and Biochemical Zoology*. 85:4 (397-404)

Jinka, T.R., Barrickman, Z.A., Bogren, L.K., Lee, T.N., Olson, J.M., Richter, M.M., Salli, B.M., Stevenson, T.J., Tøien, Ø., Buck, C.L., Drew, K.L. (2012). "Potential mechanisms of metabolic suppression downstream of central A1AR activation during onset of torpor". In: Ruf T, Bieber C, Arnold W, Milesi E (Eds). *Living in a Seasonal World: Thermoregulatory and Metabolic Adaptations*. Springer, Heidelberg

Florant, G.L., Richter, M.M., and S.K. Fried (2012). "The effect of ambient temperature on body mass, torpor, food intake, and leptin levels: implications on the regulation of food intake in mammalian hibernators". In: Ruf T, Bieber C, Arnold W, Milesi E, (Eds). *Living in a Seasonal World: Thermoregulatory and Metabolic Adaptations*. Springer, Heidelberg.

Sheriff, M.J., Kenagy, G.J., Richter, M., Lee, T., Tøien, Ø., Kohl, F., Buck, C.L., Barnes, B.M. (2010). "Phenological variation in annual timing of hibernation and

breeding in nearby populations of Arctic ground squirrels". Proceedings of the Royal Society B: Biological Sciences. 278:1716 (2369-2375)

Healy, J.E., Richter, M.M., Suu, L., Fried, S.K., Florant, G.L. (2008). Changes in serum leptin concentrations with fat mass in golden-mantled ground squirrels (*Spermophilus lateralis*). Lovegrove, B.G. and McKechnie, A.E. (eds.) Hypometabolism in animals: torpor, hibernation and cryobiology. University of KwaZulu-Natal, Pietermaritzburg.

Publications in Prep

Lee, T.N., Richter, M.M., Williams, C.T., Tøien, Ø., Barnes, B.M., O'Brien, D.M., Buck, C.L. "Stable isotope analysis of CO₂ in breath indicates metabolic fuel shifts in torpid arctic ground squirrels" *submitted to Journal of Comparative Physiology – B*

Richter, M.M., Barnes, B.M., O'Reilly, K.M., Fenn, A.M., Buck, C.L. "The influence of androgens in hibernation phenology of free-living male arctic ground squirrels"

Richter, M.M., Gaglioti, B.V., Buck, C.L., Barnes, B.M. "Does the availability of a food cache affect timing of hibernation and spring reproductive status in male arctic ground squirrels (*Urocitellus parryi*)?"

Richter, M.M., Buck, C.L., Barnes, B.M., Sheriff, M.J. "Effects of a prolonged autumn on an arctic hibernator"