



Catherine Kotz, PhD.

- **Associate Professor for Research**, GRECC, Minneapolis VA Health Care System, Minneapolis, MN
- **Associate Professor**, Food Science and Nutrition, Minnesota Obesity Center, University of Minnesota, Minneapolis, MN
- **Graduate Faculty in Neuroscience**, University of Minnesota, Minneapolis, MN

Research Interests:

Our laboratory focuses on brain sites and substrates mediating energy balance, in obesity prone and obesity-resistant animal models. The goal of our laboratory is to understand brain mechanisms important in determining the propensity for obesity. These investigations involve study of neuropeptides that regulate feeding behavior and energy expenditure, including that related to physical activity. Our most recent focus is on the role of orexin, also known as hypocretin. Orexin is a recently identified neuropeptide predominantly located in the lateral hypothalamus that enhances feeding and physical activity, and which also modifies sleep/wake patterns. Our laboratory has shown that orexin elevates non-volitional low-level activity, which has an important impact on body weight control. We have also shown that this low level activity may be important in maintaining obesity resistance during aging. The techniques we use include stereotaxic surgery, immunohistochemistry, food intake measurements, physical activity chamber measurements, indirect calorimetry, body composition (EchoNMR) radioimmunoassay and molecular biology procedures, including RNA/DNA extraction, northern blots, slot blots, rtPCR, cDNA probe synthesis, random primer labeling, hybridization, densitometry and microarrays.

Recent Publications:

Kotz CM, Teske JA, Billington CJ. Neuroregulation of non-exercise activity thermogenesis (NEAT) and obesity resistance. *Am J Physiol Regul Integr Comp Physiol*. 2008 Mar;294(3):R699-710. Invited review.

Perry CA, Pravetoni M, Teske JA, Aguado C, Erickson DJ, Medrano JF, Luján R, **Kotz CM**, Wickman K. Predisposition to late-onset obesity in GIRK4 knockout mice. *Proc Natl Acad Sci U S A*. 2008;105:8148-53.

Teske JA, **Kotz CM**. Effect of acute and chronic caloric restriction and metabolic glucoprivation on spontaneous physical activity in obesity-prone and obesity-resistant rats. *Am J Physiol Regul Integr Comp Physiol*. 2009 Jul;297(1):R176-84. Epub 2009 May 6. PMID: 19420294

Teske JA, Billington CJ, **Kotz CM**. Hypocretin/Orexin and Energy Expenditure. *Acta Physiol (Oxf)*. 2010 Jan 12. [Epub ahead of print] PMID: 20070282.

Nixon JP, Zhang M, Wang C, Kuskowski MA, Novak CM, Levine JA, Billington CJ, **Kotz CM**. Evaluation of a Quantitative Magnetic Resonance Imaging System for Whole Body Composition Analysis in Rodents. *Obesity (Silver Spring)*. 2010 Jan 7. PMCID: PMC2919581; NIHMSID: NIHMS221979.

Kotz CM. Biological Regulation of Physical Activity Level. *Physical Activity and Obesity*, 2nd Edition. 2010. Chapter 16, pp 70-72. Invited Review. ISBN-13: 978-0-7360-7635-7.

Mavanji V, Teske JA, Billington CJ, **Kotz CM**. Elevated sleep quality and orexin receptor mRNA in obesity-resistant rats.. *Int J Obes (Lond)*. 2010 May 25. [Epub ahead of print].

Garland, T, Schutz, H, Chappell, MA, Kenney, B, Meek, TH, Copes, LE, Acosta, A, Drenowatz, C, Maciel, RC, Van Diik, G, **Kotz, CM**, Eisenmann, JC. The biological control of voluntary exercise, spontaneous physical activity, and daily energy expenditure in relation to obesity: human and rodent perspectives. *J Exp Biol*. 2011 Jan 15;214(Pt 2):206-29.

Teske JA, Billington CJ, Kuskowski MA, **Kotz CM**. Spontaneous physical activity protects against fat mass gain. *Int J Obes (Lond)*. 2011 May 24. [Epub ahead of print] PMID: 21610695.

(For a comprehensive list of [recent publications](#), refer to PubMed, a service provided by the National Library of Medicine.)

Education:

- **BS Biology** – University of Minnesota, St. Paul, MN 1984
- **MS Human Nutrition** – University of Minnesota, St. Paul, MN 1990
- **PhD Nutritional Biochemistry** – University of Minnesota, St. Paul, MN 1993
- **Minneapolis VA Medical Center** – Neuroscience of Feeding, Minneapolis, MN 1993-96

Contact Information:

Voice: Office: 612-467-3312

Email: kotzx004@umn.edu