

CURRICULUM VITAE  
Justin D. Crane, Ph.D.

### Contact Information

**Address:** Northeastern University  
211C Mugar Life Sciences Building  
360 Huntington Avenue  
Boston, MA 02115  
**Phone:** (617) 373-6581  
**E-mail:** j.crane@northeastern.edu

### Positions Held

8/2015–Present Assistant Professor, Department of Biology, Northeastern University  
1/2013–8/2015 Post-doctoral Fellow, Division of Endocrinology and Medicine, McMaster University

### Education

2008–2012 Ph.D., Cell Biology and Bioenergetics of Aging, McMaster University  
2006–2008 M.S., Exercise Physiology, Ball State University  
2002–2006 B.S., Biochemistry, Rutgers University

### Awards and Honors

2002–2006 Entrance scholarship, Rutgers University  
2009–2012 Dalley Doctoral Scholarship, McMaster University

### Supervisory Experience

#### Graduate

9/2016–Present: Wesley Wong, PhD student

#### Undergraduate

Nicholas Wolnick, research volunteer, Fall 2017  
Amy Costello, research volunteer, Summer 2 2017  
Courtney Chambers, Directed study, Summer 2, 2017; Fall 2017  
Graham Thomas, research volunteer, Summer 2017  
Yikai Kuo, Directed study, Spring 2017  
Danielle Voke, Directed study, Fall 2016  
Melody Rivera, Directed study, Fall 2016  
Julian Yabut, graduate student, 3/2014–8/2015  
Samuel Yellin, summer research student, 6/2014–8/2014  
Anton Rogachov, undergraduate Honors thesis student, 9/2013–4/2014  
Jason Park, co-op undergraduate thesis student, 5/2013–12/2013  
Kelvin Wong, undergraduate Honors thesis student, 9/2011–5/2011  
Jennifer Li, undergraduate Honors thesis student, 9/2010–5/2011

### Teaching Experience

Mammalian Systems Physiology (BIOL3603; FALL2017), Northeastern University  
Inquiries in Cell and Molecular Biology (BIOL2299; SPR2016, SPR2017 semesters), Northeastern University  
Anatomy and Physiology lab instructor (1A03/1Y03 & 1AA3/1YY3, 5 semesters), McMaster University  
Physical Activity and Epidemiology TA (1C03, 1 semester), McMaster University

### Patents

Therapeutic method of inducing mitochondrial biogenesis to treat skin and muscle pathologies  
M Tarnopolsky, J Crane - US Patent App. 14/992,969, 2016

CURRICULUM VITAE  
Justin D. Crane, Ph.D.

**Peer Review**

*Aging Cell, FASEB Journal, Scientific Reports, The Journals of Gerontology*

**Editorial Board Membership**

8/2016–Present: *Scientific Reports*, Endocrinology Section

**Grant Review Experience**

Canadian Diabetes Association Grant Committee Member, 11/2015

**Invited Presentations**

11/18/2016- Keynote Speaker, Minnesota Dermatological Society Winter Meeting, Minneapolis, MN.

“Reversing the effects of aging of the skin: The role of mitochondria and exercise and how this may lead to specific anti-aging therapies”.

**Publications**

1. Kanji S, **Crane JD**, Driedger M, Ong F, Haq T, Timmons B, Steinberg GR and Morrison KM. The relationship of brown adipose tissue activity to body composition and physical activity in children. In submission at *Physiological Reports* January 2017.
2. Haq T, **Crane JD**, Kanji S, Gunn E, Tarnopolsky MA, Gerstein H, Steinberg GR and Morrison KM. Optimizing the methodology for measuring supraclavicular skin temperature using infrared thermography; implications for measuring brown adipose tissue activity in humans. *Scientific Reports*, 2017 Sep 20;7(1):11934.
3. Mottillo EP, Desjardins EM, Fritzen AM, Zou VZ, **Crane JD**, Yabut JM, Kiens B, Erion DM, Lanba A, Talukdar S, Granneman JG and Steinberg GR. FGF21 does not require adipocyte AMP-activated protein kinase (AMPK) or the phosphorylation of acetyl-CoA carboxylase (ACC) to mediate improvements in whole-body glucose homeostasis. *Molecular Metabolism*. 2017 Apr 5;6(6):471-481.
4. Smith BK, Ford RJ, Desjardins EM, Green AE, Houde VP, Day EA, Marcinko K, **Crane JD**, Mottillo EP, Kemp BE, Tarnopolsky MA and Steinberg GR. Salsalate (salicylate) uncouples mitochondria, improves glucose homeostasis, and reduces liver lipids independent of AMPK  $\beta$ 1. *Diabetes*. 2016 Nov;65(11):3352-3361.
5. **Crane JD**, Yellin SA, Ong FJ, Singh NP, Konyer N, Noseworthy MD, Schmidt LA, Saigal S and Morrison KM. ELBW survivors in early adulthood have higher hepatic, pancreatic and subcutaneous fat. *Scientific Reports*. 2016 Aug 17;6:31560.
6. Mottillo EP, Desjardins EM, **Crane JD**, Smith BK, Green AE, Ducommun S, Henriksen TI, Rebalka IA, Razi A, Sakamoto K, Scheele C, Kemp BE, Hawke TJ, Ortega J, Granneman JG, Steinberg GR. Lack of adipocyte AMPK exacerbates insulin resistance and hepatic steatosis through brown and beige adipose tissue function. *Cell Metabolism*. 2016 Jul 12;24(1):118-129.
7. Bujak AL, **Crane JD**, Lally JS, Ford RJ, Kang S, Rebalka IA, Green AE, Kemp BE, Hawke TJ, Schertzer JD, Steinberg GR. AMPK activation of muscle autophagy prevents fasting-induced hypoglycemia and myopathy during aging. *Cell Metabolism*. 2015 Jun 2;21(6):883-90.
8. Lally JS, Ford RJ, Johar J, **Crane JD**, Kemp BE, Steinberg GR. Skeletal muscle AMPK is essential for the maintenance of FNDC5 expression. *Physiological Reports*. 2015 May;3(5). pii: e12343.

## CURRICULUM VITAE

Justin D. Crane, Ph.D.

9. Ford RJ, Fullerton MD, Pinkosky SL, Day EA, Scott JW, Oakhill JA, **Crane JD**, Blumer R, Marcinko K, Bujak AL, Kemp BE, Gerstein HC, Steinberg GR. Synergistic effects of clinical doses of metformin and salicylate on AMPK activity, liver de novo fatty acid synthesis and insulin sensitivity in mice and humans. *Biochem Journal*. 2015 May 15;468(1):125-32.
10. **Crane JD**, MacNeil LG, Lally JS, Ford RJ, Bujak AL, Kemp BE, Raha S, Steinberg GR, Tarnopolsky MA. Exercise-stimulated interleukin-15 is controlled by AMPK and regulates skin metabolism and aging. *Aging Cell*. 2015 Apr 22.
11. Ogborn DI, McKay BR, **Crane JD**, Safdar A, Akhtar M, Parise G, Tarnopolsky MA. Effects of age and unaccustomed resistance exercise on mitochondrial transcript and protein abundance in skeletal muscle of men. *Am J Physiol Regul Integr Comp Physiol*. 2015 Apr 15;308(8):R734-41.
12. **Crane JD**, Palanivel R, Mottillo EP, Bujak AL, Wang H, Ford RJ, Collins A, Blumer RM, Fullerton MD, Kim JJ, Ghia J, Hamza SM, Morrison KM, Dyck JR, Schertzer JD, Khan WI, Steinberg GR. Inhibiting peripheral serotonin synthesis reduces obesity and metabolic dysfunction by promoting brown adipose tissue thermogenesis. *Nature Medicine*. 2015 Feb;21(2):166-72.
13. Kolesar JE, Safdar A, Abadi A, MacNeil LG, **Crane JD**, Tarnopolsky MA, Kaufman B. Defects in mitochondrial DNA replication and oxidative damage in muscle of mtDNA mutator mice. *Free Radical Biology & Medicine*. 2014 Oct;75:241-51
14. Ogborn DI, McKay B, **Crane JD**, Parise G, Tarnopolsky MA. The unfolded protein response is triggered following a single, unaccustomed resistance-exercise bout. *Am J Physiol Regul Integr Comp Physiol*. 2014 Sep 15;307(6):R664-9
15. **Crane JD**, Mottillo EP, Farncombe TH, Morrison KM, Steinberg GR. A standardized infrared imaging technique that specifically detects UCP1-mediated thermogenesis *in vivo*. *Molecular Metabolism*. 2014 Apr 21;3(4):490-4.
16. Henriksbo BH, Lau TC, Cavallari JF, Denou E, Chi W, Lally JS, **Crane JD**, Duggan BM, Foley KP, Fullerton MD, Tarnopolsky MA, Steinberg GR, Schertzer JD. Fluvastatin causes NLRP3 inflammasome-mediated adipose insulin resistance. *Diabetes*. 2014 Nov;63(11):3742-7.
17. **Crane JD**, Abadi A, Hettinga BP, Ogborn DI, Macneil LG, Steinberg GR, Tarnopolsky MA. Elevated Mitochondrial Oxidative Stress Impairs Metabolic Adaptations to Exercise in Skeletal Muscle. *PLoS One*. 2013 Dec 6;8(12):e81879.
18. Suer MK, **Crane JD**, Trappe TA, Jemiolo B, Trappe SW, Harber MP. Amino Acid Infusion Alters the Expression of Growth Related Genes in Multiple Skeletal Muscles. *Aviat Space Environ Med*. 2013 Jul;84(7):669-74.
19. Abadi A, **Crane JD**, Ogborn D, Hettinga B, Akhtar A, Stokl A, Macneil LG, Safdar A, Tarnopolsky MA. Supplementation with A-Lipoic Acid, CoQ10, and Vitamin E Augments Running Performance and Mitochondrial Function in Female Mice. *PLoS One*. 2013;8(4):e60722.
20. **Crane JD**, MacNeil LG, Tarnopolsky MA. Long-term aerobic exercise is associated with greater muscle strength throughout the lifespan. *Journal of Gerontology A Biol Sci Med Sci*. 2013 Jun;68(6):631-8

## CURRICULUM VITAE

Justin D. Crane, Ph.D.

21. Ogborn DI, Smith KT, **Crane JD**, Safdar A, Hettinga BP, Tuppler R, Tarnopolsky MA. Effects of creatine and exercise on skeletal muscle of FRG1-transgenic mice. *Canadian Journal of Neurological Sciences*. 2012 Mar;39(2):225-31.
22. **Crane JD**, Ogborn DI, Cupido C, Melov S, Hubbard A, Bourgeois JM, Tarnopolsky MA. Massage therapy attenuates inflammatory signaling after exercise-induced muscle damage. *Science Translational Medicine*. 2012 Feb 1;4(119):119ra13.
23. O'Neill HM, Maarbjerg SJ, **Crane JD**, Jeppesen J, Jørgensen SB, Schertzer JD, Shyroka O, Kiens B, van Denderen BJ, Tarnopolsky MA, Kemp BE, Richter EA, Steinberg GR. AMP-activated protein kinase (AMPK)  $\beta 1\beta 2$  muscle null mice reveal an essential role for AMPK in maintaining mitochondrial content and glucose uptake during exercise. *Proceedings of the National Academy of Sciences U S A*. 2011 Sep 20;108(38):16092-7.
24. Harber MP, Dickinson JM, **Crane JD**, Trappe SW, Trappe TA. Influence of tracer selection on protein synthesis rates at rest and post-exercise in multiple human muscles. *Metabolism*. 2011 May;60(5):689-97.
25. **Crane JD**, Devries MC, Safdar A, Hamadeh MJ, Tarnopolsky MA. The effect of aging on human skeletal muscle mitochondrial and intramyocellular lipid ultrastructure. *Journal of Gerontology A Biol Sci Med Sci*. 2010 Feb;65(2):119-28.
26. Harber MP, **Crane JD**, Dickinson JM, Jemiolo B, Raue U, Trappe TA, Trappe SW. Protein synthesis and the expression of growth-related genes are altered by running in human vastus lateralis and soleus muscles. *Am J Physiol Regul Integr Comp Physiol*. 2009 Mar;296(3):R708-14.
27. Harber MP, **Crane JD**, Douglass MD, Weindel KD, Trappe TA, Trappe SW, Fink WF. Resistance exercise reduces muscular substrates in women. *International Journal of Sports Medicine*. 2008 Sep;29(9):719-25.