

# Dr Natalie Clare Holt

natalie.c.holt@gmail.com

857-204-6183

## EDUCATION

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- 2010 PhD, University of Leeds  
The effects of mechanical performance on muscle and whole animal locomotor energetics
- 2005 BSc (1<sup>st</sup> class), University of Bristol  
Equine Science

## PROFESSIONAL APPOINTMENTS

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- 2013-present Post-doctoral research fellow, UC Irvine
- 2011-2013 Post-doctoral research fellow, Harvard University
- 2011 Post-doctoral research fellow, University of Leeds
- 2005-2006 Lecturer, University of the West of England

## PUBLICATIONS

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- Holt NC, Roberts TJ, Askew GN** (2014) The energetic benefits of tendon springs in running: is the reduction of muscle work important. *J. Exp. Biol.* **217**: 4365-4371
- Holt NC, Azizi E** (2014) What drives activation dependent shifts in the force-length curve? *Biol. Lett.* **10**: 20140651
- Holt NC, Wakeling JM, Biewener AA** (2014) The effect of fast and slow motor unit activation on whole-muscle mechanical performance: the size principle may not pose a mechanical paradox. *Proc. R. Soc. B* **281**: 20140002
- Holt NC, Askew GA** (2012) Locomotion on a slope in leaf-cutter ants: metabolic energy use, behavioural adaptations and the implications for route selection. *J. Exp. Biol.* **215**: 2545-2550
- Holt NC, Askew GA** (2012) The effects of asymmetric length trajectories on the efficiency of mouse soleus muscles. *J. Exp. Biol.* **215**: 324-330
- Faria J, Dyer J, Clément R, Couzin I, Holt NC, Ward A, Waters D, Krause J** (2010) A novel method for investigating the collective behaviour of fish: introducing “Robofish”. *Behav. ecol. sociobiol.* **64** (8): 1211-1218

**Miller G, Neilan M, Chia R, Gheryani N, Holt NC, Charbit A, Wells S, Tucci V, Lalanne Z, Denny P, Fisher EMC, Cheeseman M, Askew GN, Dear TN** (2010) ENU Mutagenesis Reveals a Novel Phenotype of Reduced Limb Strength in Mice Lacking Fibrillin 2. *PLoS ONE*. **5(2):e9137**

**Holt NC, Danos N, Roberts TJ, Azizi E** Stuck in gear: age-related loss of variable gearing in skeletal muscle. *Submitted to Proc. Roy. Soc. B*

**Holt NC, Azizi E** The effect of activation level on muscle function during locomotion: are optimal lengths and velocities always used? *In prep.*

## GRANTS AND FELLOWSHIPS

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2013 Contributing author on NIH grant awarded to A Biewener and J Wakeling

2013 Company of Biologists travel grant

2011 Contributing author on BBSRC grant awarded to G Askew and R Bomphrey

2010 Society of Experimental Biology travel grant

## INVITED TALKS

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2015 University of Washington, WA  
Beyond cross-bridges: the effect of structural properties on vertebrate muscle performance

2014 CSU San Bernadino, CA  
The effect of activation level on skeletal muscle performance

2013 Royal Veterinary College, London  
Evaluating and refining Hill-type muscle models: the effect of selective motor unit recruitment on muscle mechanical output

## CONFERENCE PRESENTATIONS (selected)

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**Holt NC, Azizi E** (2015) The effect of activation level on in vivo muscle lengths and velocities *Society for Experimental Biology annual conference*

**Holt NC, Danos N, Roberts T, Azizi E** (2015) Unable to shift gears: the loss of variable gearing in aged muscle *Society for Integrative and Comparative Biology annual conference*

**Holt NC, Wakeling JW, Biewener AA, Aziz E** (2014) Skeletal muscle performance under sub-maximally activated conditions. *American Physiological Society meeting*

**Holt NC, Abbott E, Azizi E** (2014) Muscle activation level, compliance and the force-length relationship *Society for Integrative and Comparative Biology annual conference*

**Holt NC, Wakeling JM, Biewener AA** (2013) The effect of selective motor unit recruitment on whole muscle mechanical performance. *Society for Experimental Biology annual conference*

**Holt NC, Miara M, Wakeling JM, Biewener AA** (2013) The effect of muscle fibre recruitment on whole muscle force-velocity properties *in situ*. *Society for Integrative and Comparative Biology annual conference*

**Holt NC, Roberts TJ, Askew GA** (2012) Economical muscle function during running: do tendon springs save energy? *Society for Experimental Biology annual conference*

**Holt NC, Askew GA** (2010) The energetic costs of *in vivo* contraction cycles. *Society for Experimental Biology annual conference*

**Holt NC, Askew GA** (2008) The effect of length trajectory on the efficiency of mouse skeletal muscle. *Society for Experimental Biology Annual Conference*

## TEACHING EXPERIENCE

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**CSU San Bernadino, CA** (guest lecturer)  
Muscles recruitment and fiber type (05/2015)

**CSU San Bernadino, CA** (guest lecturer)  
Muscles and tendons in locomotion (04/2015)

**Harvard University** (teaching fellow)  
Human anatomy and physiology (2011-2012)

**University of Leeds** (teaching assistant)  
Animal physiology (2007-2009)  
Introductory statistics (2006-2008)

**Hartpury College** (lecturer)  
Exercise physiology (2005-2006)  
Anatomy and physiology (2005-2006)  
Introduction to veterinary science (2005-2006)  
Genetics (2005)

## PROFESSIONAL MEMEBERSHIP

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2007-present Society for experimental biology member

2011-present Society for integrative and comparative biology

## REFEREES

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Manny Azizi  
University of California, Irvine  
5236 McGaugh Hall  
Irvine, CA 92697  
eazizi@uci.edu

Andrew Biewener  
Concord Field Station  
100 Old Causeway Rd  
Bedford, MA 01703  
abiewener@oeb.harvard.edu

Graham Askew  
University of Leeds (IMSB)  
Clarendon Way  
Leeds, LS2 9JT  
G.N.Askew@leeds.ac.uk