

SEAN HACKETT

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Summary of Qualifications:

- Investigates questions in systems biology and biochemistry from an experimentally-driven, computational perspective
- Analyzes genomic datasets using statistically rigorous methods and integrates resulting data in principled ways
- Bridges the gap between genetic and physiological variation
- Has a deep understanding of biology and biochemistry

Skills: *Research:* statistics, machine learning, systems biology, bioinformatics, genetics, metabolomics, proteomics
Computational: R (dplyr, ggplot2, shiny), Python, Git, UNIX, LaTeX, SQL

EDUCATION	Princeton University Ph.D., Quantitative and Computational Biology <ul style="list-style-type: none">• Thesis: <i>Quantitative Analysis of Metabolism and Protein Abundance Using Integrative 'Omics</i>• DOE Office of Science Graduate Fellowship (SCGF), Biological and Environmental Research: 09/2012 - 09/2015	Princeton, New Jersey November 2015
	Cornell University B.S., Biological Sciences <ul style="list-style-type: none">• Thesis: <i>Candidate gene analysis of German shepherd dogs to identify genes contributing to arrhythmogenesis</i>• Concentration in Genetics and Development• <i>Magna Cum Laude</i> with Distinction in Research	Ithaca, New York June 2006
RESEARCH		
DATA SCIENTIST	Calico Labs <ul style="list-style-type: none">• Developing methods for large-scale analysis of mass spectrometry data	San Francisco, CA Jan 2017 - Present
POSTDOCTORAL ASSOCIATE	Princeton University, Lewis-Sigler Institute <ul style="list-style-type: none">• Supervisor: John Storey, Professor of Genomics; Director of Center for Statistics and Machine Learning• Applied methods from topic modeling to identify latent variables affecting high-dimensional sport data.• Mapped QTLs of yeast competitive growth phenotypes.	Princeton, NJ Dec 2015 - Jan 2017
GRADUATE FELLOW	Princeton University, Quantitative and Computational Biology <ul style="list-style-type: none">• Adviser: Josh Rabinowitz, Professor of Chemistry and Genomics• Developed a scalable algorithm for combining metabolomics, proteomics and fluxes to provide novel insight into how metabolism is controlled. This allowed me to identify 3 novel instances of metabolic regulation and to dissect how metabolite and enzyme concentrations jointly drive metabolic flux. (DOE grant DE-SC0012461 was subsequently awarded to continue this research.)• Identified a pattern of metabolite changes in primary human pancreatic tumors, which led to the discovery that intact extracellular proteins are a major source of nutrients in cancer.	Princeton, NJ Sep 2010 - Dec 2015
RESEARCH SPECIALIST	Cornell University, Molecular Biology and Genetics <ul style="list-style-type: none">• Supervisor: Andy Clark, Professor of Population Genetics• Developed high-throughput experimental methods for quantifying natural variation in <i>Drosophila</i> metabolism (e.g. flight, gas-exchange and enzyme activities) and computational methods for feature extraction.	Ithaca, NY June 2006 - Sep 2010

SELECTED PUBLICATIONS

- Sean R. Hackett and John D. Storey. *Mixed Membership Martial Arts: Data-Driven Analysis of Winning Martial Arts Styles*. MIT Sloane Sports Conference, 2017.
- Sean R. Hackett, Vito R.T. Zanotelli, Wenxin Xu, Jonathan Goya, Junyoung O. Park, David H. Perlman, Patrick A. Gibney, David Botstein, John D. Storey, and Joshua D. Rabinowitz. *Systems-level analysis of mechanisms regulating yeast metabolic flux*. *Science*, 345, 2016.
- JK Grenier, JR Arguello, M Cardoso Moreira, S Gottipati, J Mohammed, SR Hackett, R Boughton, AJ Greenberg & AG Clark. *Global Diversity Lines - A five-continent reference panel of sequenced Drosophila melanogaster strains*. *G3*, 5(4), 2015.
- J Kamphorst, M Nofal, C Commisso, SR Hackett, W Lu, E Grabocka, G Miller, JA Drebin, MG Vander Heiden, D Bar-Sagi, CB Thompson, JD Rabinowitz. *Human pancreatic cancer tumors are nutrient poor and the tumor cells actively scavenge extracellular protein*. *Cancer Research*, 75, 2015.
- Robin Mathew, Sinan Khor, Sean R. Hackett, Joshua D. Rabinowitz, David H. Perlman & Eileen White. *Functional role of autophagy-mediated proteome remodeling in cell survival signaling and innate immunity*. *Molecular Cell*, 55(6), 2014.
- Jeffrey S. Bruenig, Sean R. Hackett, Joshua D. Rabinowitz & Leonid Kruglyak. *Genetic basis of metabolome variation in yeast*. *PLoS Genetics*, 2013.
- C Commisso., SM Davidson, RG Soydaner-Azeloglu, SJ Parker, JJ Kamphorst, SR Hackett, E Grabocka, M Nofal, JA Drebin, CB Thompson, JD Rabinowitz, CM Metallo, MG Vander Heiden & D Bar-Sagi. *Macropinocytosis of protein is an amino acid supply route in Ras-transformed cells*. *Nature*, 497, 2013.
- AJ Greenberg, SR Hackett, LG Harshman & AG Clark. *Environmental and genetic perturbations reveal different networks of metabolic regulation*. *Molecular Systems Biology*, 7:563, 2011.
- AJ Greenberg, SR Hackett, LG Harshman & AG Clark. *A hierarchical bayesian model for a novel sparse partial diallel crossing design*. *Genetics*, 185(1):361-373, June 2010.

TALKS

- 2017 MIT Sloane Sports Analytics Conference. Research Paper Competition finalist. *Mixed Membership Martial Arts: Data-Driven Analysis of Winning Martial Arts Styles*
- 2016 Genomic Sciences Program Annual PI Meeting. *Systems-Level Analysis of Mechanisms Controlling Yeast Metabolic Flux*
- 2014 Agilent Emerging Omics Research Tour: 'Omics and Integrated Biology. *Exploring Metabolic Regulation Via Integrative 'Omics*.
- 2014 Yeast Genetics Meeting. Plenary Talk: Environmental Sensing Networks. *An Integrated 'Omics Approach to Large-Scale Quantitative Analysis of Cellular Metabolic Regulation*
- 2013 International Conference on Systems Biology. Parallel Session: Complex Genetic Traits *Genetic Basis of Metabolome Variation in Yeast*

TEACHING EXPERIENCE

INSTRUCTOR	Introductory Data Analysis with R Course (3 sessions at Calico).	Fall 2017
TEACHING ASSISTANT	RStudio Master R Developer Workshop (advanced R workshop taught by Hadley Wickham)	September 2016
INSTRUCTOR	Statistical Programming with R workshop (Princeton).	March 2015
	Statistical Programming with R workshop (Princeton).	October 2014
TEACHING ASSISTANT	An integrated, mathematically and computationally sophisticated introduction to biochemistry, molecular biology, genetics, genomics and evolution (undergraduate course taught by David Botstein, Eric Weichaus & Peter Andolfatto)	Fall 2012
	Advanced Statistics for Biology (graduate course taught by John Storey)	Spring 2012