

# Roslyn Dakin

## Curriculum Vitae

Smithsonian Conservation Biology Institute  
Migratory Bird Center

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## Appointments

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2017-2019 Postdoctoral Fellow, Smithsonian Conservation Biology Institute, Migratory Bird Center  
*Social behaviour in wire-tailed manakins*  
Mentor: Brandt Ryder

2013-2017 Postdoctoral Fellow, Department of Zoology, UBC (maternity leave 2016-17)  
*Visual control of complex behaviour in flight*  
Mentor: Doug Altshuler

2014-16 NSERC Postdoctoral Fellowship, UBC  
2011-13 Teaching Fellow, Queen's University

## Education

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2006-13 PhD & MSc Biology, Queen's University  
*Linking courtship behaviour, colour perception and mate choice decisions*  
Advisor: Bob Montgomerie

2002-06 BSc Honours, Queen's University

## Research Interests

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- Sensory and decision-making algorithms of behavior
- Influence of movement on ecological, social, and communication systems
- Mechanisms of social behavior and reproductive performance
- Function and evolution of multivariate phenotypes

## Publications

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† undergraduate co-author

1. **R Dakin\***, PS Segre\*, AD Straw and DL Altshuler. Morphology, muscle capacity, skill, and maneuvering ability in hummingbirds. **Science** 359: 653-657. doi:10.1126/science.aao7104  
*Featured in a Perspective article in the same issue.*
2. PS Segre\*, **R Dakin\***, TG Read, AD Straw, and DL Altshuler. (2016) Mechanical constraints on flight at high elevation decrease maneuvering performance of hummingbirds. **Current Biology** 26: 3368-3374. doi:10.1016/j.cub.2016.10.028  
*\* Co-first author.*
3. EE LeDue, K Mann, E Koch†, B Chu, **R Dakin**, and MD Gordon. (2016) Starvation-induced depotentiation of bitter taste in *Drosophila*. **Current Biology** 26: 2854-2861. doi:10.1016/j.cub.2016.08.028

4. **R Dakin**, TK Fellows, and DL Altshuler. (2016) Visual guidance of forward flight in hummingbirds reveals control based on image features instead of pattern velocity. **PNAS** 113: 8849-8854. doi:10.1073/pnas.1603221113
5. **R Dakin**, JQ Ouyang, ÁZ Lendvai, MF Haussmann, IT Moore, and F Bonier. (2016) Weather matters: begging calls are temperature- and size-dependent signals of offspring state. **Behaviour** 153: 871-896. doi:10.1163/1568539X-00003370.
6. **R Dakin**, O McCrossan†, JF Hare, R Montgomerie, and SA Kane. (2016) Biomechanics of the peacock's display: how feather structure and resonance influence multimodal signaling. **PLoS One** 11(4): e0152759. doi:10.1371/journal.pone.0152759

*In the top 1% most downloaded articles for PLoS One.*

7. **R Dakin**, ÁZ Lendvai, JQ Ouyang, IT Moore, and F Bonier. (2016) Female-like plumage colour is associated with increased partner parental care. **Animal Behaviour** 111: 111-118. doi:10.1016/j.anbehav.2015.10.006
8. PS Segre, **R Dakin**, A Straw, VB Zordan, MH Dickinson, and DL Altshuler. (2015) Burst muscle performance predicts the speed, acceleration, and turning performance of hummingbirds. **eLife** doi:10.7554/eLife.11159
9. DL Altshuler, JW Bahlman, **R Dakin**, AH Gaede, B Goller, D Lentink, PS Segre, and DA Skandalis. (2015) The integrative biology of bird flight: functional relationships among aerodynamics, morphology, kinematics, muscles and sensors. **Canadian Journal of Zoology** 93: 961-975. doi:10.1139/cjz-2015-0103
10. JQ Ouyang, ÁZ Lendvai, **R Dakin**, A Domalik†, V Fasanello†, B Vassallo†, MF Haussmann, IT Moore, and F Bonier. (2015) Weathering the storm: parental effort and experimental manipulation of stress hormones predict brood survival. **BMC Evolutionary Biology** 15: 219. doi:10.1186/s12862-015-0497-8
11. ÁZ Lendvai, Ç Akçay, JQ Ouyang, **R Dakin**, A Domalik†, PS St John†, M Stanback, IT Moore, and F Bonier. (2015) Analysis of the optimal duration of behavioral observations based on an automated continuous monitoring system in tree swallows: is one hour good enough? **PLoS One** 10(11): e0141194. doi:10.1371/journal.pone.0141194
12. **R Dakin** and R Montgomerie. (2014) Condition-dependent mate assessment and choice by peahens: implications for sexual selection. **Behavioral Ecology** 25: 1097-1104. doi: 10.1093/beheco/aru087
13. **R Dakin** and R Montgomerie. (2014) Deceptive copulation calls attract female visitors on leks. **American Naturalist** 183: 558-564. doi: 10.1086/675393
14. **R Dakin** and R Montgomerie. (2013) Eye for an eyespot: how iridescent ocelli influence peacock mating success. **Behavioral Ecology** 24: 1048-1057. doi: 10.1093/beheco/art045

*2<sup>nd</sup> most downloaded PDF of 2013 in Behavioral Ecology. Highlighted as the Editor's Choice.*

15. **R Dakin**. (2011) The crest of the peafowl: a sexually dimorphic plumage ornament signals condition in both males and females. **Journal of Avian Biology** 42: 405-414. doi: 10.1111/j.1600-048X.2011.05444.x
16. **R Dakin** and R Montgomerie. (2011) Peahens prefer peacocks displaying more eyespots, but rarely. **Animal Behaviour** 82: 21-28. doi: 10.1016/j.anbehav.2011.03.016

*Highlighted as a Featured Article in the July 2011 issue of Animal Behaviour.*

17. **R Dakin** and R Montgomerie. (2009) Peacocks orient their courtship displays towards the sun. **Behavioral Ecology and Sociobiology** 63: 825-834. doi: 10.1007/s00265-009-0717-6

*Featured in Principles of Animal Communication (2011) by Bradbury & Vehrencamp.*

## Manuscripts in Progress

18. SA Kane, D van Beveren<sup>†</sup> and **R Dakin**. A potential mechanosensory role for feathers during social displays. **In revision for the Journal of Experimental Biology** (reviews received November 9, 2017). Preprint available: <https://www.biorxiv.org/content/early/2017/10/02/197525>
19. DL Altshuler, PS Segre, and **R Dakin**. Maneuverability in hummingbirds. **Invited review for the Journal of Experimental Biology**. Manuscript in preparation.
20. TK Fellows, **R Dakin**, B Goller, L Tyrell, E Fernández-Juricic, and DL Altshuler. The spatial and temporal acuity of the hummingbird visual system is lower than predicted by scaling. Analyses complete and manuscript in preparation.

## Reproducible Data and Analyses

1. figshare. (2017) Statistical supplement to: *Evolution reveals the biomechanical organization of maneuvering flight in hummingbirds*. doi: <https://doi.org/10.6084/m9.figshare.5307136.v3>
2. figshare. (2017) Statistical supplement to: *Biomechanics of the peafowl's crest: a potential mechanosensory role for feathers during social displays*. doi: <https://doi.org/10.6084/m9.figshare.5451379>
3. figshare. (2016) Statistical supplement to: *Visual guidance of forward flight in hummingbirds reveals control based on image features instead of pattern velocity*. doi: <https://doi.org/10.6084/m9.figshare.3382759.v4>
4. figshare. (2016) Statistical supplement to: *Mechanical constraints on flight at high elevation decrease maneuvering performance of hummingbirds*. doi: <https://doi.org/10.6084/m9.figshare.3466361.v4>
5. Dryad. (2015) Data from: *Burst muscle performance predicts the speed, acceleration, and turning performance of Anna's hummingbirds*. doi: <http://dx.doi.org/10.5061/dryad.14762>
6. Dryad. (2013) Data from: *Deceptive copulation calls attract female visitors to peacock leks*. doi: <http://dx.doi.org/10.5061/dryad.vt562>

## Other Published Work (non-refereed)

1. **R Dakin**. (2012) Grades, the currency on campus. **University Affairs** magazine, December.
2. **R Dakin**. (2012) Accreditation of environmental degree programs raises concerns. **University Affairs** magazine, November.
3. **R Dakin**. (2012) Getting up close to nature. **Kingston Whig Standard** newspaper, February 4.

## Selected Recent Conference Presentations

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\* presenting author                      † undergraduate co-author

**R Dakin\***, PS Segre, AD Straw, and DL Altshuler. (2018) Hummingbird evolution reveals the biomechanical organization of maneuverability. SICB, San Francisco. Oral presentation.

SA Kane, D Van Beveren<sup>†\*</sup>, and **R Dakin**. (2018) Biomechanics of the peafowl's crest: a potential mechanosensory role for feathers during social displays. SICB, San Francisco. Poster presentation.

SA Kane\*, **R Dakin**, Y Lu<sup>†</sup>, and R Fang<sup>†</sup>. (2018) Courtship display dynamics and iridescent structural color in peacocks and related ocellated pheasant species. SICB, San Francisco. Oral presentation.

**R Dakin\***, TK Fellows, and DL Altshuler. (2016) Hummingbirds visually control forward flight using image features instead of image pattern velocity. SICB, Portland. Oral presentation.

**R Dakin\***, O McCrossan<sup>\*†</sup>, JF Hare, R Mongomerie, SA Kane\*. (2016) The biomechanics of an audiovisual courtship display: how peacocks shake their feathers to produce a coordinated signal. SICB, Portland. Poster.

PS Segre\*, **R Dakin**, VB Zordan, MH Dickinson, AD Straw, and DL Altshuler. (2016) Burst muscle performance predicts the speed, acceleration, and turning performance of hummingbirds. SICB, Portland. Oral presentation.

**R Dakin\***, TK Fellows, and DL Altshuler. (2015) Effect of optic flow on flying birds is inhibited by feature size. Behaviour 2015, Cairns. *Selected for the symposium "Vision using two eyes"*.

**R Dakin\***. (2013) How iridescent ocelli influence peacock mating success. AOU Joint Ornithological Society Meeting, Chicago. *Invited contribution to the symposium "Physiological and functional advances in avian coloration"*.

**R Dakin\***. (2013) Linking courtship behavior, color perception and mate choice decisions. Animal Behavior Society, Boulder. *Finalist in the Warder Clyde Allee Award competition symposium*.

## **Scholarships and Fellowships**

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Smithsonian Institution Fellowship Award (2017-2019)	\$96,000
NSERC Postdoctoral Fellowship (2014-16)	\$90,000
R.S. McLaughlin Fellowship, Queen's University (2011-12)	\$10,000
Ontario Graduate Scholarship, Science and Technology (2010-11)	\$15,000
NSERC Scholarship, Doctoral (2008-10)	\$42,000
Dean's Doctoral Field Travel Grant, Queen's University (2009)	\$3,000
NSERC Scholarship, Master's (2006-08)	\$34,800
Sport Canada Scholarship, Canadian National Sailing Team (2003-04)	\$10,500

## **Awards**

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Broadening Participation Award, Society for Integrative and Comparative Biology (2018)  
Dorothy Skinner Award for research excellence, Society for Integrative and Comparative Biology (2016)  
Dean of Science Excellence in Service Award, UBC Faculty of Science (2015)  
UBC Postdoc Conference Travel Award (2015)  
American Ornithologists' Union Student Travel Award (2013)  
Canadian Foundation for Innovation Emerging Science Journalist Award (2011)  
Fred Cooke Award, Society for Canadian Ornithologists (2008)  
Conference Travel Grant, Iridescence: More than Meets the Eye (2008)  
Ontario Sailing Leadership Award (2007)  
Medal in Biology, Queen's University (2006)  
Helen Arlis Denyes Scholarship in Biology, Queen's University (2005)  
James H. Rattray Scholarship in Science, Queen's University (2004)  
Wallace Near Prize in Biology, Queen's University (2004)

## **Teaching**

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As a graduate student, I was awarded a fellowship to teach 3<sup>rd</sup> year Animal Behaviour, a lecture and laboratory course with >100 undergraduate students, as well as the online course Ecology and the Environment in 2012 and again in 2013. All courses below were at Queen's University in Canada.

### **Courses Taught**

Ecology and the Environment BIOL111 (Summer 2012, 2013)

*Nominated for the Christopher Knapper Teaching Award*

Animal Behaviour BIOL321 (Fall 2011) <http://www.roslyndakin.com/biol321>

### **Teaching Assistantships**

Evolutionary Genetics BIOL206 (Spring 2012)

History and Philosophy of Biology BIOL433 (Spring 2011)

Evolution and Human Affairs BIOL350 (Fall 2011)  
The Biology of Sex BIOL210 (2007-12)  
Data Management and Analysis BIOL243 (Fall 2006)  
Differential and Integral Calculus MATH121 (2003-04 help session instructor)

### **Guest Lectures**

Data Management and Statistics for Biologists BIOL243 (I taught the 1<sup>st</sup> week; Fall 2013)  
Comparative Cognition PSYC 355 (Spring 2013)  
Nanoscience and Nanotechnology PHYS483 (Winter 2008; Spring 2012)  
The Biology of Sex BIOL210 (2008-10)  
Population and Evolutionary Ecology BIOL302 (Fall 2006)

### **Education Courses Completed**

Teaching and Learning in Higher Education SGS901, with Andy Leger (Spring 2013)

### **Advising and Mentoring**

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Paolo Segre, PhD UBC (2013-15)	current: postdoc at Stanford University
Tyee Fellows, MSc UBC (2013-15)	medical school at U of T
Chun Chi Lau, BScH UBC (2014-15)	medical school at Oxford
Hannah Visty, BSc UBC (2014-15)	MSc at UBC, Forest and Conservation Sciences
Jordan Roth, BSc UBC (2014-15)	BSc at UBC, Computer Science and Statistics
Michelle Loranger, BScH Queen's (2012-13)	MSc at Carleton, Biology
Alison Porter, BScH Queen's (2011-12)	MSc at UBC, Zoology

### **Service**

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R Study Group (workshops on statistical software), UBC (2014-16)  
R Club (workshops on statistical software), Queen's University (2012-13)  
Hiring Committee, Integrative Cell Biologist, Queen's University (2012)  
Hiring Committee, Instructor for Introductory Biology, Queen's University (2011)  
Appointments, Review, Tenure & Promotion Committee (elected representative, Queen's) (2010-12)  
Biology Graduate Students' Committee, Queen's University (2010-12)  
Organizing Committee, Society of Canadian Ornithologists conference (2007)

**Reviewer** for American Naturalist, Animal Behaviour, Behavioral Ecology, Behavioral Ecology and Sociobiology, Biological Journal of the Linnean Society, Biology Letters, Biotropica, BMC Evolutionary Biology, Ethology, Functional Ecology, Journal of Ornithology, National Geographic Society grants, Peerage of Science, PLoS One, The Auk, the Society for Integrative and Comparative Biology, and the Werner & Hildegard Hesse Ornithological Research Awards at UBC

### **Outreach**

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Ladies Learning Code workshop mentor, "HTML and CSS for beginners" (2017)  
National Learn to Code Day mentor, "Using Data to Solve Problems: Intro to AI and Machine Learning" (2017)  
Sedona Hummingbird Festival, invited speaker (2017)  
Peacock Day Los Angeles, keynote at an outreach event with over 4,400 attendees, 170 at talk (2017)  
Reddit PLoS Science Wednesday, invited host for science Ask Me Anything series (2016)  
Science Fair Judge, Greater Vancouver Regional Science Fair (2016)  
"Peacocks are Way Cool because..." public event at the Beaty Biodiversity Museum (2015)  
Los Angeles Arboretum, invited speaker (2010, 2015)  
Canadian Association for Girls in Science, mentor and field trip organizer (2013)

CFRC 101.9, training coordinator for a radio program by and for seniors (2012-13)  
Science Fair Judge, Frontenac, Lennox and Addington Regional Science Fair (2011-13)  
SEEDS at Queen's University, taught animal behaviour to 7-8<sup>th</sup> grade students (2012)  
"Hen's Quest: A Peacockumentary" shortlisted for US Animal Behavior Society film awards (2011)  
YouTube, created videos about my research with >100,000 views: [youtube.com/user/roslyndakin](https://www.youtube.com/user/roslyndakin)

## **Media Coverage**

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*Maneuvering ability in hummingbirds...* Science, Science News, Seeker, Daily Mail, BBC, CBC  
*Visual guidance of forward flight in hummingbirds...* Gizmodo, Christian Science Monitor, BBC Radio, City TV, Vancouver Sun, National Geographic feature story  
*Biomechanics of the peacock's display...* New York Times/Science Take, Quirks and Quarks, Science News, Christian Science Monitor, Gizmodo, Wall Street Journal, Nature Research Highlights, Scientific American, Discover, PBS Newshour  
*Deceptive copulation calls...* Quirks and Quarks, BBC Nature News, Science News, National Geographic, NPR  
*Eye for an eyespot: how iridescent ocelli influence peacock mating success...* The Nature of Things, Slate  
*Peahens prefer peacocks displaying more eyespots...* Nature News, Wired, Science News

## **References**

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Contact information for references available upon request

### **Dr. Doug Altshuler** (*post-doc mentor*)

Professor  
Department of Zoology  
University of British Columbia, Canada

### **Dr. Bob Montgomerie** (*PhD supervisor*)

Professor  
Department of Biology  
Queen's University, Canada

### **Dr. Suzanne Amador Kane** (*collaborator*)

Professor and Chair  
Physics and Astronomy Department  
Haverford College, USA

### **Dr. Brandt Ryder** (*mentor as of Sept. 2017*)

Research Ecologist  
Migratory Bird Center  
Smithsonian Conservation Biology Institute, USA