

## Curriculum Vitae for Nicolai Konow, Ph. D.

Brown University, Ecology & Evolutionary Biology, Box G-B204 Providence RI 02912 USA.

☎ +1 443 416 8632 ✉ nkonow@brown.edu 🌐 nicolaikonow 🌐 brown.edu/research/functional\_biology/

### Narrative

Since my Ph. D. on the biomechanics of biting in coral reef fishes, my focus has been on evolution of jaw and limb movement mechanics and animal mechanics aid the development of tools for restoring human movements.

### Positions (funding source)

11-on. Brown University, USA, with S. M. Swartz & T. J. Roberts. (AFOSR) *Bat flight muscle-tendon mechanics*

09-11. Brown University, USA, with T. J. Roberts. (NIH) *Series elastic mechanisms in limb muscle systems*

08-09. Johns Hopkins University, USA, with R. Z. German. (NIH) *Muscle mechanics of food processing*

06-08. Hofstra University, USA, with C. P. J. Sanford. (NSF) *Morphology and biomechanics of food processing*

### Education

08-09. Clinical Research Associate Diploma, Johns Hopkins Medical Institute (SOM) Dept. Phys Med & Rehab.

00-06. Ph. D. James Cook University, AU, Bellwood Lab. Thesis: Feeding ecomorphology of biting reef fish. 📄

97-99. MSc. University of Copenhagen, DK, Jespersen Lab. Thesis: Retinal specializations in deep-sea fishes.

92-97. BSc. University of Copenhagen, DK, Høeg Lab. Thesis: The evolutionary origin of tetrapod vertebrates.

### Federal and other competitive grantsmanship

2014: UQCIEF (AU). Mechanics of human foot arch deformation. *Collaborator*, PI: G. Lichtwark (UQ). \$25K

2011: NSF MRI-1126234. Acquisition of 3D PIV system. *Collaborator*, PI: CPJ Sanford (Hofstra). \$360K

2010: Nat. Geo. EC-043910. Fish that feed at break-neck speed. *Joint PI* w. S Husky (WKU). \$50K

2006: Nat. Geo. RP-815306. Grouper suction feeding. *Joint PI* w. S Husky (WKU) & A Rhyne (RWU). \$15K

2000: FNU 642000229. Danish Research Agency. Doctoral Dissertation Fellowship. *PI*. \$225K

### Peer-reviewed journal publications *\*undergraduate, ^graduate student collaborator*

29. ^Cheney J, Konow N, Swartz S (2015) Bat wing membrane mechanical behavior and the role of elastin in membrane anisotropy. *R. Soc. Interface*. RSIF-2014-01286 📄

28. Konow N, Roberts TJ. (2015) The series elastic shock absorber: tendon compliance modulates muscular energy dissipation during burst deceleration. *Proc. R. Soc. B* 282: 20142800 📄

27. ^Cheney J, Konow N, Middleton K, Breuer K, Swartz S. (2014) Membrane muscle function in the compliant wings of bats. *Biomim. Bioinsp.* BB-100028 📄 News coverage: [NSF](#), [NYTimes](#), [Science-Take \(video\)](#), [Popular Science](#), [Daily Mail](#), [PhysOrg](#)

26. ^Cheney J, \*Ton D, Konow N, Riskin DK, Breuer KS, Swartz SM. (2014). Hindlimb motion during steady flight of the lesser dog-faced fruit bat, *Cynopterus brachyotis* ***PloS One*** S-13-32415 📄

25. Roberts TJ, Konow N. (2013). How tendons buffer energy dissipation by muscle. *ESSR* 41, 186-193 📄

24. Konow N, \*Krijestorac B, Sanford CPJ, Boistel R, Herrel A, (2013). Prey processing in the Siamese fighting fish, *Betta splendens*. ***J. Comp. Physiol. A.*** 199 (7), 641-51 📄

23. ^Gidmark N, Konow N, \*LoPresti E, Brainerd E. (2013). Bite force is limited by the force–length relationship of skeletal muscle in black carp, *Mylopharyngodon piceus* **Biol. Lett.** 9 (2), 20121181 📄 News coverage: Inside JEB, Discovery channel (Daily Planet) Canada, Science Daily, Science360
22. \*Matson A, Konow N, \*Miller S, Konow PP, Roberts TJ (2012) Tendon material properties vary and are interdependent among turkey hindlimb muscles. **J. Exp. Biol.** 215, 3552-3558 📄
21. ^Holman SW, Konow N, Lukasik S, German RZ (2012) Regional variation in geniohyoid muscle strain during suckling in the infant pig. **J. Exp. Zool. A.** 317, 359-370 📄
20. Konow N, Azizi E, Roberts TJ (2012) Muscle power attenuation by tendon during energy dissipation. **Proc. R. Soc. B.** 279, 1108-1113 📄 News coverage: Scientific American, Medill, Physorg, Science ORF, R&Dmag, ABC, ABC42, Brown Press Release
19. Ferry LA, Konow N, Gibb AC (2012) Are kissing gourami specialized for substrate-feeding? Prey capture kinematics of *Helostoma temminckii* and other anabantoid fishes. **J. Exp. Zool. A.** 317, 571-579 [cover] 📄
18. Konow N & Bellwood DR (2011). Functional disparity and ecological diversification in marine angelfishes, f. Pomacanthidae. **PLoS One.** 6, e24113 📄 News coverage: Discovery News
17. Konow N, Herrel A, Ross CF, Williams SH, German RZ, Sanford C, \*Gintof C. (2011). Jaw and hyoid muscle activity patterns driving chewing in jawed vertebrates. **Integr. Comp. Biol.** 51(2), 235-246 📄 News coverage: NSF news, Discovery News, PBS News-hour, and notably, Creation Evo Headlines
16. German RZ, Campbell-Malone R, Crompton, AW, Ding P, \*Wahl S, Konow N, Thexton AJ (2011). The concept of hyoid posture. **Dysphagia.** 26(2), 97-89 📄
15. ^Wentzel S, Konow N, German RZ. (2011) Hyoid muscle activity during head movements in mammals. **J. Exp. Zool. A.** 315A, 111-174 📄
14. Konow N, German RZ, Thexton A, Crompton A (2010) Regional differences in length-change and electromyographic heterogeneity in the sternohyoid muscle during infant mammalian swallowing. **J. Appl. Physiol.** 109, 439-448. 📄
13. \*Gintof C, Konow N, Ross CF, Sanford CPJ (2010). Rhythmicity in teleost chewing: a comparison with amniotes. **J. Exp. Biol.** 213, 1868-1875. 📄
12. Konow N, Ferry-Graham LA (2010). Ecomorphology of Butterflyfishes. Chapter 2 *In: Biology of Butterflyfishes* (Eds. MS Pratchett, M Berumen, BG Kapoor). **CRC Press.** 📄
11. Bellwood DR, Konow N, Herwerden L, Klanten SO (2010) Evolutionary History of Butterflyfishes (f. Chaetodontidae): the Rise of Coral Feeding Fishes. **J. Evol. Biol.** 23, 237-446. 📄
10. Ferry-Graham LA, Konow N. (2010). Is an intramandibular joint in *Girella* a mechanism for increased force production? **J. Morph.** 271, 271-279. 📄
09. \*Camp AL, Konow N, Sanford CPJ (2009). Functional morphospace of the tongue-bite apparatus in *Chitala ornata* (Notopteridae) and *Salvelinus fontinalis* (Salmonidae). **J. Anat.** 214, 717-728. 📄
08. Konow N, Sanford, CPJ (2008). Is a convergently derived muscle-activity pattern driving novel raking behaviours in teleost fishes? **J. Exp. Biol.** 211:989-999. 📄
07. Konow N, Sanford CPJ. (2008). Biomechanics of a convergently derived prey-processing mechanism in fishes: evidence from morphology and raking kinematics. **J. Exp. Biol.** 211, 3378-3391. 📄
06. Konow N, Wainwright PC, Bellwood DR, Kerr AM (2008). Evolution of novel jaw joints promote trophic diversity in coral reef fishes. **Biol. J. Linn. Soc.** 93: 545-555. 📄
05. Konow N, \*Camp AL, Sanford CPJ (2008). Congruent modulation-patterns in muscle activity and kinematics govern a convergently derived teleosts prey-processing behaviour. **Integr. Comp. Biol.** 48(2):246-260. 📄
04. Konow N, Gerry S (2008). Symposium introduction: Electromyography interpretation and limitations in functional analyses of musculoskeletal function. **Integr. Comp. Biol.** 48(2):241-245. 📄

03. Konow N, Fitzpatrick R, \*Barnett A (2006). Adult emperor angelfish (*Pomacanthus imperator*) clean giant sunfishes (*Mola mola*) at Nusa Lembongan, Indonesia. **Coral Reefs** 25: 208. 📄
02. Konow N, Bellwood DR (2005) Prey-capture in *Pomacanthus semicirculatus* (Teleostei, Pomacanthidae): functional implications of intramandibular joints in marine angelfishes. **J Exp. Biol.** 208:1421-1433. 📄  
News coverage: BBC Wildlife, 'Totally Wild' Aus. Channel Ten, Inside JEB
01. Bellwood DR, van Herwerden L, Konow N (2004). Evolution and biogeography of marine angelfishes (Pisces: Pomacanthidae) **Mol. Phylogen. Evol.** 33: 140-155. 📄

### Manuscripts submitted and in preparation

Konow N, Roberts T, Cheney J, von Busse R, Swartz S. (Revised). Spring or string: does tendon stretch influence elbow extensor function in bat wings during flight? *Proc. B.* RSPB-2014-2009

Swartz SM, Konow N (in review). Advances in the study of bat flight; the wing and the wind. *Can. J. Zool.* 2015-0117

Konow N, von Busse R, Cheney J, Breuer K, Roberts J, Swartz S. (in prep) How do bats modulate muscle recruitment intensity with respect to flight speed?

Gidmark N, Konow N, Tarrant J, Brainerd E. (in prep) Musculoskeletal mechanics of pharyngeal jaw food processing in cyprinid fishes.

Konow N, Gidmark N, Astley H, Camp A, Falkingham P, Stover K, Brainerd EL. (Commentary in prep): general principles of muscle-tendon-skeletal function in feeding biomechanics.

Konow N, Roberts TJ. (in prep) Instantly prepared for impact; preparatory limb muscle force development is tuned to anticipated impact intensity.

Konow N, Price S, Abom R, Bellwood D, Wainwright PC. (in prep) Contrasting ecomorphological diversification rates in reef butterflyfishes and bannerfishes (Chaetodontidae).

Ferry LA, Konow N, Gibb AC. (in prep) Does intramandibular flexion aid extreme gape expansion in the kissing gourami, *Helostoma temminckii*?

Wallace I, Konow N. (in prep) Differences in muscle force production during locomotion do not affect muscle attachment site morphology and trabecular bone formation.

Frédérich B, Santini F, Lecchini, Konow N, Alfaro ME. (in prep) The impact of dwarfism on diversification in marine Angelfishes (f. Pomacanthidae).

Ravi S, Konow N, Combes S, Biewener A. (in prep) Pectoralis motor patterns and flight control strategies of hummingbirds flying in highly directional vortices and fully mixed turbulence.

### Invited seminars

2015 University of British Columbia. Department of Zoology. *Muscles as motors, springs, struts and buffers.*

Loyola University of Chicago. Department of Biology. *Muscle motors and tendon springs in movement systems – from evolutionary morphology to questions in human health.*

U. Maine at Farmington, Department of Biology. *Muscle motors, bony levers, tendon springs and evolutionary patterns in feeding mechanics.*

California Polytechnic University San Louis Obispo. Biological sciences department. *Physiology and mechanics of feeding muscles: from evolutionary patterns to problems in human health.*

Rowan University, School of Biology and Mathematics: *Feeding system physiology and mechanics: from evolutionary patterns to problems in human health.*

2014 University of Nevada at Las Vegas, School of Life Sciences seminar series: *Springs, motors and brakes; muscle-tendon mechanics in animal movement.*

- U. Mass. Lowell, Biology Colloquium: *Evolutionary patterns in feeding muscle mechanics.*
- 2013 University of Washington, Friday Harbor Labs: *Springs motors and brakes in animal movements.*  
 University of Massachusetts at Dartmouth, Biology Department Seminar: *Playing with power: tendon elasticity helps muscle shape animal movement.*  
 University of Massachusetts at Lowell, Biology Colloquium: *Playing with power: tendon elasticity helps muscle shape animal movement.*  
 California State University at San Bernadino, Biology Department: *Integrated function of multi-muscle systems and evolution of animal movement*
- 2012 University of Antwerpen, Laboratory of Functional Morphology seminar series: *Evolutionary links between morphological innovations and the trophic ecology of biting in fishes.*  
 University of Gent, Vertebrate Evolutionary Morphology seminar series: *Structural innovation, functional disparity and evolution of reef fish biting.*  
 University of Liege, Functional and evolutionary morphology seminar series: *Morphological innovation and functional disparity of biting in reef fishes.*  
 Universite Libre de Bruxelles, Evolutionary Biology & Ecology: *Evolution of biting in marine fishes: links between structural novelty, functional diversity and ecosystem resilience.*  
 Kennesaw State University, Department of biology and physics. *Muscle function in animal movement.*
- 2010 University of Chicago, Org. Biol. & Anat. seminar, *Innovation and disparity principles in functional biology*  
 Brown University, EEB Dept. Brown Bag seminar, *Muscular control of animal movement.*  
 University of Queensland, School of Biomedical Science, *Innovation and disparity in comparative anatomy*
- 2009 University of Western Kentucky. Dept. Biology seminar: *Structural innovations and functional disparity*  
 Ohio University, Biol. & Biomed. Sci. seminar: *Innovation and disparity concepts in functional biology*  
 Brown University, EEB Dept. Brown Bag seminar: *Innovations and disparity in comparative biology*  
 Roger Williams University, Biology seminar series: *Innovations and disparity concepts in biology*

### **Invited symposium contributions**

- 2014 Konow N, Roberts TJ. *Muscle Tendon Unit Mechanics during Energy Absorbing Activities.* Contribution to symposium on elastic mechanisms. World Congress of Biomechanics, Boston MA, July 6-11.  
 Roberts, Konow N et al. *Exploring springs inside muscles: Does extracellular matrix provide an important elastic mechanism?* Contribution to symposium on elastic mechanisms. WCB, Boston MA, July 6-11.
- 2010 Konow N, et al. *Shifts in muscle activity patterns during evolution of gnathostome feeding* SICB.
- 2008 Konow N & Sanford CPJ. *Pros and cons of electromyography in an integrative experimental context.* Late Breaking symposium: EMG interpretation and limitations in functional analyses of musculoskeletal function. SICB, San Antonio TX.  
 Konow N & Gerry S. *Symposium Introduction; interpretation and limitations of EMG in functional analyses of musculoskeletal function.* Late Breaking symposium: SICB, San Antonio TX.

**Selected conference abstracts** (over the last five years, out of a total of 71).

2014. Konow N, et al. *X-ray Based Reconstruction of Proximal Wing Muscle Tendon Unit Mechanics in Bat Flight*. World Congress of Biomechanics, Boston MA, July 6-11.

Cheney JA, et al. *Bat wing skin mechanical behavior*. Soc. Integr. Comp. Biol. (SICB) Austin TX.

Ferry LA, et al. *Determining the mechanism of intramandibular bending in *Helostoma temmincki**. SICB.

Gidmark NJ, et al. *Determinants of muscle shape change in eccentric and concentric contractions*. SICB.

Konow N, et al. *Mechanics of proximal limb muscle tendon units in a small flying mammal*. SICB.

2013. Swartz S, et al. *Integrating aerodynamics and energetics to understand how bats change flight dynamics with speed*. International Congress of Vertebrate Morphologists. Barcelona.

Konow N, et al. *Can bat wing muscle tendon units operate as force controllers?* ICVM.

Roberts TJ, et al. *Mechanisms governing muscle bulging during locomotor activities*, ICVM.

Gidmark NJ, et al. *Role of muscle force vs. work in trophic specialization of minnows*. ICVM.

Konow N, et al. *Can bat wing muscles stretch their tendon to enable force control of joint movement?* Society for Experimental Biology, Valencia.

Gidmark NJ, et al. *Mechanisms governing muscle shape changes during locomotor activities*. SEB.

Cheney JA, et al. *Electromyography of bat wing membrane muscles*. SICB, San Francisco.

Gidmark NJ, et al. *Role of muscle force vs. work in trophic specialization of minnows*. SICB.

Konow N et al. *The muscle recruitment intensity relationship with flight speed in bats*. SICB.

2012. Roberts TJ, Konow N. *Determinants of passive force production in muscle during locomotion*. SEB.

Konow N, Roberts TJ. *Series elastic compliance protects actuators during high-powered deceleration* Dynamic Walking Conference.

Gidmark NJ, et al. *Bite force limitation by the length-tension relationship of skeletal muscle in three cyprinid fish species*. SICB, Charleston.

Konow N, Roberts TJ. *Does extended training alter extensor muscle operating length?* SICB.

2011. Gidmark NJ, et al. *Bite force varies with pharyngeal jaw orientation and adductor muscle length in common carp: XROMM and 3D modeling approaches* SICB, Salt Lake City.

Konow N, Roberts TJ. *Energy absorption by muscle in steady and unsteady movement* SICB.

Matson A, et al. *Variations in tendon material properties among muscles* SICB.

Ferry LA, et al. *Kissing and scraping: the intramandibular joint in *Helostoma temmincki** SICB.

2010. Konow N, Azizi E, Roberts TJ. *Limb muscle function during high-powered energy absorption*. American Society of Biomechanics, Providence.

Konow N, Azizi E, Roberts TJ. *Limb muscle-tendon unit function in power-attenuation during rapid energy absorption*. Society of Experimental Biology, Prague.

Konow N, Azizi E, Roberts TJ. *Avian all-terrain: Tendons as power attenuators during rapid energy absorption*. SICB, Seattle.

German RZ, Crompton A, Konow N, Thexton A. *Sensory stimulus and reflex response in mammalian swallowing*. SICB, Seattle.

**Classroom experience**

Year, Uni.	Course name, number, enrolment	Level	Lab Hours	Lecture hours	Type: Lecture, lab, seminar, group, fieldwork, mentoring
2015 Brown	BIOL 1880, Comparative Vertebrate Anatomy and Physiology	Senior	4/wk	3/week	Dissection and experimental labs, 3 lecture and 2 laboratory midterms
07-08, Hofstra	Behavior, ecology and evolution (Bio 014), 40 enrolled pr. semester	Lower	2/wk	-	Experimental labs, 4 practical exams, independent research
08-09, Hofstra	Animal Form and Function (Bio 012), 50 enrolled pr. semester	Lower	-	5/sem	Lectures on cardiovascular, neural, feeding and locomotor systems
06-09, Hofstra	Human anatomy and physiology (Bio 103)	Lower	4/wk	-	Lab coordination, 4 practical exams
06-09, Hofstra	Anatomy and physiology (Bio 105)	Upper	4/wk	-	Lab coordination, 4 practical exams
06-09, Hofstra	Independent research project (Bio 90, 91, 190)	Upper	-	-	Research mentor for 12 BSc & 4MSc students
00-05 JCU	Biology of reef fishes (MB3160)	Upper	3/wk	2/sem	Workstation labs, lecture on fish feeding form & function
00-05 JCU	Marine Zoology (MB 2050)	Lower	3/wk	-	Workstation labs, conducting practical exams
99-00 KU	Zoological Morphology and Physiology 1	Lower	3/wk	3/sem	Laboratory coordinator and Lecturing assistant
98-99 KU	Zoological Morphology and Physiology 2	Upper	3/wk	3/sem	Laboratory coordinator and Lecturing assistant
97-98 KU	Zoological Morphology and Physiology 1	Lower	-	3/sem	Lectures on vertebrate eye morphology, feeding in fishes

**Undergraduate student research mentoring resulting in manuscripts for peer-review**

Student	Year	Institution	Deg.	Thesis title	Publication #
Ariel Camp	06-08	Hofstra	BSc.	Fish food processing biomechanics	5,9
Chris Gintof	07-08	Hofstra	BSc.	Rhythmicity in vertebrate chewing	13,17
Belma Krijestorac	08	Hofstra	BSc.	<i>Betta splendens</i> food processing	24
Rickard Aabom	04-05	JCU	BSc.	Biting reef fish cranial morphology	In review

**Select student research projects mentored (out of 40+)**

Student	Year	degree	Thesis title	Pub (#)	Advisor, institution
Mary Lou Hedberg	2014-15	MSc	Mechanical function in bats of digit extensors in bat flight		Prof. S. M. Swartz, Brown
David Boerma	2013-	PhD	Bat shoulder biomechanics		Prof. S. M. Swartz, Brown
Phil Lai	2013-2014	MSc.	Bat scapula-humeral interlocking mechanics		Prof. S. M. Swartz, Brown
Jorn Cheney	2010-2014	PhD	Wing membrane muscle function in bats	26, 27,	Prof. S. M. Swartz, Brown
Samuel Miller, Andrew Matson	2010-2011	Pre Med	Exercise effects on tendon	20	Prof. T. J. Roberts, Brown
Nicholas Gidmark	2009-2012	PhD	Carp pharyngeal jaw muscle physiology and mechanics	23	Prof. E. L. Brainerd, Brown
Gregory Kurtz	2008-2009	MSc	Cross-correlation analyses of muscle activity and strain		Prof. R. Z. German, Johns Hopkins U.
Shaina Holman	2009-2011	PhD	Regional strain in hyoid muscles in infant feeding	19	Prof. R. Z. German, Johns Hopkins U.
Sarah Wentzel	2009-2010	MSc.	Hyoid strap muscle activity during head movements	14	Prof. R. Z. German, Johns Hopkins U.
Jackie Thrasher	2007-2008	MSc	Shark feeding metabolics		Prof. C. Sanford, Hofstra
Matthew Ajemian	2006-2008	MSc.	Shark feeding biomechanics		Prof. C. Sanford, Hofstra

# refers to numbering in the publication list above, or indicates status of manuscripts

## Honors and smaller awards

2011: Apeks Marine Equipment, UK. Technical dive equipment award:	\$3,000
2009: Johns Hopkins University travel award:	\$1,000
2008: Hofstra University, Deans travel award:	\$1,500
2007: SICB symposium funding from SICB-DCB, JEB, AD instruments, Grass Technologies:	\$6,000
2005: JCU GRS, Ph. D. Research prize and international travel award:	\$5,500
2003: Pixoft – NAC, Movias high-speed motion analysis software:	\$7,000
2001: Sea Pro UK. UW housing for DV video:	\$1,500
2001: Australian Coral Reef Society research award:	\$2,500

## Field expedition and lab visits

July 2013; April 2012: University of Antwerp, Belgium, Department of Biology. Hosts: Prof. P. Aerts and Dr. E. Heiss: *Fluoromicrometry and electromyography of anuran hyoid function.*

Jun.-Jul. 10: National Geographic sponsored expedition with S. Huskey: *Fish that feed at break-neck speed.* Media coverage in *Naked Science*, European title: *Hunters of the Deep*. Watch it here.

Jun. 07-Jul. 08: National Geographic-sponsored work, with Dr. S. Huskey & Dr. A. Rhyne: *Recording underwater high-speed video to measure suction feeding kinematics in Goliath Grouper.*

Aug. 2007: University of Antwerpen, Department of Biology, Belgium. Hosts: Dr. A. Herrel & Prof. P. Aerts: *X-ray video of hyoid motion in rainbow trout, Betta and learning small animal EMG techniques.*

Aug. 2004: University of Hawaii - Mena, Hawaii Institute of Marine Biology, Oahu – Hawaii. Host: Dr. B. Bowen, Dr. R. Pyle & Prof. T. Tricas: *Feeding kinematics in Hawaiian butterfly and angelfishes.*

Jul. 2004: University of California Davis, USA. Host: Prof. P. Wainwright.: *Feeding behavioral modulation.*

Jun. 2004: Aliwal shoal, Durban - S. Africa, Host: Mr. R. Jackson, ESKOM: *Measuring prey-capture kinematics in angel and butterflyfishes of the West Indian Ocean.*

May 2004: University of the Ryukyu's, Sesoko Marine Laboratory, Akajima Field Laboratory. Host: Dr. M. Arvedlund: *Measuring prey-capture kinematics in angel and butterflyfishes of Japan.*

2001-2006: Lizard Island and Orpheus Island Research Stations, GBR, Australia: *Microhabitat utilization and prey-capture kinematics of Great Barrier Reef angel and butterflyfishes.* 200+ field-days.

Dec. 2003: R/V Undersea Explorer: Cod Hole GBR, Osprey Reef, Coral Sea: *Grouper suction-feeding.*

Sept. 2000: One Tree Island Research Station, with M. J. Marnane, Collecting angel and butterflyfishes for morphology and kinematics analyses, and collecting Cardinalfishes to measure defecation rates.

Jul. 2000: Expeditions with R/V Harry Messel and R/V Lady Basten (A.I.M.S.), Outer Great Barrier Reef, collecting angel and butterflyfishes for morphospace analyses using barrier nets and spear guns.

Jan.-May 97: Visiting Researcher, Dept. Anatomical Sciences, Adelaide University, Australia. Host: Dr. N. A. Locket. MSc. pilot study: *"light transmission and electron transmission microscopy of retinal morphology deep sea teleost fishes"*.

## Service

### Symposium organization, session moderation and student talk judging at meetings

2016. Symposium organizer (w. N. J. Gidmark): Society for Experimental Biology. Symposium title: *Moving to feeding; applying muscle-mechanics principles from limb to jaw systems*. (Confirmed, July 2016)
2014. Nomination committee for Chair-elect and Secretary-elect, Division of Vertebrate Morphology, SICB.
- 2009-2014. Session moderator, judge of student talks: Society for Integrative and Comparative Biology.
2009. Program organizer: Society for Integrative and Comparative Biology, regional DVM meeting.
2009. Convener of "Morph-group", in the Dept. Ecology and Evolutionary Biology, Brown University.
2008. Session moderator: American Society for Ichthyologists and Herpetologists.
2008. Symposium organizer (w. S. P. Gerry): Society for Integrative and Comparative Biology. Symposium title: *Electromyography interpretation and limitations in functional analyses of musculoskeletal function*.

### Service on committees and working groups

- X-ray Motion Analysis (XMA) Research Coordination Network. Brown University and partner universities
- Working group: The Feeding Experiments End-user Database (FEED). Hosted by NESCent.

### Service as *ad hoc* reviewer

- Proposals:* NSF (USA), Fonds Wetenschappelijk Onderzoek (BE), National Science Council (RO).
- Journals:* Biology Letters, Proceedings of the Royal Society London, Royal Society Interface, Evolution, Journal of Experimental Biology, Functional Ecology, Integrative and Comparative Biology, Journal of Anatomy, Journal of Morphology, Biological Journal of the Linnean Society, Journal of Biomechanics, Journal of Experimental Zoology A, Physiological and Biochemical Zoology, PLoS One, Zoology, Belgian Journal of Zoology, Journal of Experimental Marine Biology and Ecology, Journal of Fish Biology, Acta Zoology, Aquatic Living Resources, Frontiers in Zoology.

### Professional affiliations

Society for Integrative and Comparative Biology, Society for Experimental Biology, International Society for Vertebrate Morphologists, International Society of Biomechanics, American Society of Biomechanics.

### Collaborations

- Tom Roberts, Sharon Swartz (Brown): *Muscle-tendon unit mechanics in terrestrial and fluid locomotion*
- E. Heiss (Friederich Schiller), B. Brainerd (Brown): *Evolution of jaw and hyoid muscle mechanics*
- C. Ross (U. Chicago OEB), A. Herrel (NMNH): *Rhythmic and cyclic feeding muscle function*
- S. Ravi, S. Combes, A. Biewener (CFS, Harvard): *Muscle function in hummingbirds during vortex flight*
- R. German (Neomed), A. Thexton (Kings College), A. Crompton (Harvard): *Hyoid strap muscle function*
- N Gidmark, B Brainerd (Brown): *Fish pharyngeal jaw muscle physiology and mechanics*
- P. Wainwright, S. Price (UC Davis): *Functional innovation and reef fish trophic evolution*
- D. Bellwood, L. v. Herwerden (JCU): *Ecology, biogeography and phylogenetics of reef fish feeding*
- L. Ferry (ASU), A. Gibb (NAU): *Biomechanics and ecology of intramandibular joint function*



**Professional references** [click name for website; (R) knowledgeable about my research; (T) teaching]

Prof. Sharon M. Swartz (R)  
*Current postdoc mentor*  
 Ecology and Evolutionary Biology  
 Brown University Box G-B205  
 Sharon\_Swartz@brown.edu  
 Tel: +1 (401) 863 1582

Prof. Thomas J. Roberts (R)  
*Current postdoc mentor*  
 Ecology and Evolutionary Biology  
 Brown University Box G-B205  
 Thomas\_Roberts@brown.edu  
 Tel: +1 (401) 863 3608

Prof. Elizabeth L. Brainerd (R)  
*Mentor, collaborator*  
 Ecology and Evolutionary Biology  
 Brown University Box G-B205  
 Brainerd@brown.edu  
 Tel: +1 (401) 863 3324

Prof. Callum F. Ross (R)  
*Collaborator*  
 Dept. Organismal Biology &  
 Anatomy, University of Chicago  
 rossc@uchicago.edu  
 Tel: (773) 834 7858

Prof. Peter C. Wainwright (R)  
*Collaborator*  
 Section of Evolution and Ecology  
 University of California Davis  
 pcwainwright@ucdavis.edu  
 Tel: +1 (530) 752 6782

Prof. Rebecca Z. German (R)  
*Former postdoc mentor*  
 Dept. Phys. Med. & Rehabilitation  
 Johns Hopkins Medical University  
 rgerman2@jhmi.edu  
 Tel: +1 (410) 502 4461

Prof. Christopher P. Sanford (R)  
*Former postdoc mentor*  
 Department of Biology  
 Hofstra University  
 biocpj@hofstra.edu  
 Tel: +1 (516) 463 5526

Prof. Ronald Sarno (T)  
*Teaching faculty colleague*  
 Department of Biology  
 Hofstra University  
 ronald.sarno@hofstra.edu  
 Tel: +1 (516) 463 4266

Prof. Robert (Bob) Seagull (T)  
*Head of Department*  
 Department of Biology  
 Hofstra University  
 robert.w.seagull@hofstra.edu  
 Tel: +1 (516) 463 5267