

# SICB Newsletter



Volume Spring 2006

## Division of Vertebrate Morphology (DVM): 2006 Spring Newsletter

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### Message from the Chair

*Beth Brainerd*

The exciting news from SICB '06 in Orlando is that the Executive Committee approved the founding of a new division, the Division of Comparative Biomechanics (DCB). This division will draw together the traditionally strong areas of vertebrate and invertebrate biomechanics at SICB, as well as potentially encouraging participation from biomechanists working on plants, fungi and microbes. It will give the field of Comparative Biomechanics a recognizable home, which may help garner corporate and foundation funding for DCB symposia at SICB.

Most of the DVM business meeting was spent discussing this important issue. Some members were concerned that DCB will probably draw members away from DVM, or at least split their participation between DCB and DVM. There was some concern a few years ago that the creation of the Division of Evolutionary Developmental Biology (DEDB) would weaken DVM, but the result has been that DEDB has strengthened evolutionary morphology as a field at SICB. There was a suggestion that DVM simply be renamed DCB and expanded to include non-vertebrate subjects. This proposal was criticized on the grounds that morphology is broader than just biomechanics, and that vertebrate morphology in particular has a long history and strong philosophical traditions that should not be lost. On balance the attendees at the business meeting were supportive of the creation of the new DCB.

In related business, Kevin Padian made the excellent suggestion that vertebrate paleontology talks should be spread among the other sessions, rather than grouped into their own sessions. The Program Officer for DVM, Jeff Walker, will implement this recommendation for the 2007 meeting. The creation of DCB frees DVM to focus on research areas that have less overlap with biomechanics, and increasing the participation of vertebrate paleontologists could be an important part of this. Some of the vert paleo talks at SICB have strong ties to DCB, but the core business of describing fossil vertebrates and the comparative anatomical analysis of extinct and extant vertebrates are areas that could be expanded at SICB and would strengthen DVM as a division.

In further important business, David Carrier, Chair of the DVM Student Prize Committee, brought forward some recommendations from his committee for changes in the Davis Award rules. The Prize Committee recommends: (1) that each student be allowed to compete for the D. Dwight Davis Award only one time; and (2) all of the competing talks be grouped into one session, and this D. Dwight Davis Award Session run unopposed by any other DVM sessions or symposia. The rationale for the latter is that the special award session would showcase the student work and emphasize the prestige of the Davis Award. Students would still be permitted to compete for the DVM Poster Prize as many times as they like, and students would be permitted to petition the DVM Chair for permission to compete for the Davis Award a second time with a substantially different project, such as the first time a Master's project and then later a Ph.D. project. There appeared to be support at the DVM business meeting for the rule that students be allowed to compete only once, with possible dispensation for twice. Concern was expressed, however, about the possibility that the D. Dwight Davis Award Session might be perceived as a "kiddie table" which is less prestigious than the regular sessions.

Limiting each student to competing just once for the Davis Award, with possible dispensation for twice, requires a DVM bylaws change. Creating a Davis Award Session requires only an instruction from the DVM membership to the DVM Program Officer to make it so. Electronic voting on the bylaw change will occur this spring and the membership will be polled at the same time to assess support for a 2-year trial of the Davis Award Session.

DVM officer elections for Secretary Elect and Program Officer Elect will be held by electronic ballot this spring. The DVM Nominating Committee, John Hermanson (Chair), Chris Marshall and Bret Tobalske, nominated the current DVM Secretary, Gary Gillis and the current DVM Program Officer, Jeff Walker, to run unopposed. This is the first election after our bylaw change last year that increased the term limit for Program Officer from one term to two terms – a change that was made to make the most of experience gained by the PO in the first term. Thanks to Gary and Jeff for agreeing to run again and thanks to the members of the DVM Nominating Committee for their service.

### Message from the Program Officer

*Jeff Walker*

I would like to start my comments by congratulating John Bertram, the outgoing DVM Program Officer, for two huge successes at the recent Orlando meeting: first, lobbying for conference rooms large enough to accommodate the ever-popular DVM-related sessions, and second, working with the other program officers to create wonderful and well-attended, poster sessions. As Audrone Bukevicius can attest, sometimes a good poster needs to be consumed with a glass of fine wine. I presented a poster for the first time in many years and was thrilled that I had the time to explain the concepts in detail – the only thing that would have made the experience better (for me) would have been a chalkboard! Actually, this raises an interesting point. With the many new media technologies available, we should all think about how to incorporate these into 21st century poster sessions. I would also encourage poster presenters to move away from the "journal-article" style of poster presentation. Some good ideas, for example can be found at <http://www.biology.lsa.umich.edu/research/labs/ktosney/file/PostersHome.html>. DVM has a long history of sponsoring great symposia and it's time to begin developing creative symposium proposals for the 2008 San Antonio meetings. Symposia are not simply excellent vehicles for gathering together PIs from disparate fields with common research threads but can be opportunities for fostering new ways of thinking about old problems and setting an agenda for novel research

programs. Guidelines for developing a proposal are given on the SICB website. Planning and organization of speakers takes time; you have until 19 August to submit a proposal. We do have exciting symposia for the 2007 Phoenix meetings – Kevin Padian's comments at the DVM business meeting (see Beth Brainerd's news) highlight the desire of SICB members to be a part of fully integrated contributed sessions, in which the presented papers are related by unifying themes. This presents a challenge to the program officers, but this challenge is facilitated by thoughtfully checking the keyword boxes that are used to construct integrated, thematic sessions. Also, consider not checking a keyword box that could land you in a session in which you specifically do not want to be, even if this keyword is relevant to the paper. Finally, while checking boxes, please be sure to check the box to be a session chair! Good luck with your research this year – I'll be excited to hear about it over a glass of wine next January.

## Message from the Secretary

Gary Gillis

For those of us coming from regions further north, Orlando provided a nice, albeit all too brief, change of climate. I hope you all had as much fun as I did enjoying wonderful talks, engaging conversations, seeing old friends and meeting new ones (maybe even basking in the sun...). I would like to take this opportunity to personally thank Audrone Biknevičius for her excellent work in past years and for making my transition to DVM secretary as smooth as possible.

### DVM Business Meeting Notes (1/6/2006)

#### Announcements:

1. Melina Hale announced that the Society's Journal, Integrative and Comparative Biology, is now being run by Oxford University Press. Among other new features, we will soon be able to access all issues (including old American Zoologists) online.
2. Peter Aerts reminded us that the next International Congress of Vertebrate Morphology (ICVM) is being held in Paris in July 2007. Ideas for symposia were to be submitted by February 1, 2006.
3. Frank Fish let us know about a new journal, Bioinspiration & Biomimetics, which is likely to be of interest to many of our members. The first issue is likely due in early 2007. Check it out online at: <http://www.iop.org/EJ/journal/1748–3190>

He also noted that SICB's digital library has a biomechanics education website with a bibliography of useful books as well as various sample exercises. You

can see it for yourself or submit your own ideas at: <http://www.sicb.org/dl/biomechanics.php3>

4. Matthias Starck highlighted the exciting new issue of Zoology (last issue of 2005) featuring articles based on the symposium in honor of Marvalee Wake's outstanding contributions to our field.
5. Beth Brainerd announced the election of Jeff Walker as our new Program Officer and me, Gary Gillis, as our new Secretary. An enthusiastic round of applause was provided for John Bertram and Audrone Biknevičius in thanks for their efforts in these roles previously (although Jeff thought it was for him).

Beth Brainerd then introduced three issues of importance to our Division.

First, she brought up the proposal by Bob Full for a new Division of Comparative Biomechanics. A variety of potential pros (e.g., invertebrate systems could be included, more student prizes would be available) and cons (DVM might lose some clout if its membership wanes as a result of current members shifting their affiliations – currently members are limited to two divisional affiliations) were mentioned and discussed. A timely visit by the Society's new officers further enlivened this conversation and also provided an opportunity for some discussion about the program officer's difficult role in assembling the annual meeting schedule. Essentially, scheduling conflicts are inevitable given the large number of symposia. In addition, I doubt we'll see "paleo" as an organizing theme for future DVM sessions (in response to Kevin Padian's impassioned plea).

Second, Beth lamented NSF's relatively recent elimination of Doctoral Dissertation Improvement Grants (DDIGs) in our area and suggested we might try to organize a response to this.

Third, Beth introduced the possibility of making changes to the D. Dwight Davis Award competition. Dave Carrier, representing the Student Awards Committee, proposed that students be allowed to compete only once for this prize, and that all competitors present in the same (early) session at the annual meeting. An online ballot will be conducted this spring addressing these two issues separately.

### 2006 Student Award Winners

As is always the case, many of our best papers and posters were presented by students in Orlando.

#### Davis Award (Tie)

Herman Pontzer



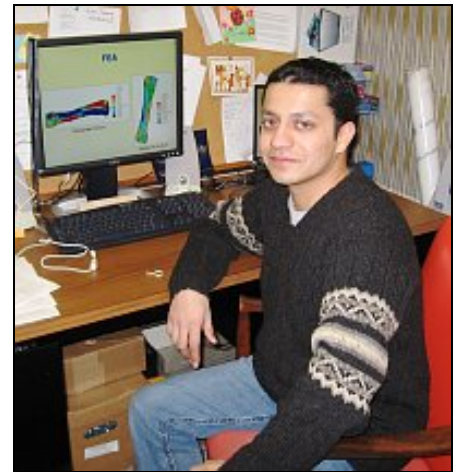
#### Davis Award (Tie)

Mason Dean



#### Poster Award

Biren Patel



This year there was a tie for the Davis award and both **Herman Pontzer** of Harvard University, pictured above walking Corby, and **Mason Dean** of the University of California, Irvine, pictured above with coauthor Manny Azizi (both are wearing thinking caps), were recognized for their outstanding work. Herman's paper was entitled "Linking Locomotor Energetics to Limb Design in Terrestrial Animals". In it he presented a test of his LiMb Model, which predicts locomotor cost from basic anatomical and kinematic variables. He was able to show that it works well across different species and different speeds of locomotion. Herman was particularly intrigued because his results suggest that differences in limb length are the driving factor underlying the scaling of locomotor costs in animals. Mason's talk was entitled "Uniform strain in broad muscles: A new twist on tendons". His work showed that the twisting of the tendon of the main jaw closer in ratfish leads to more homogenous strain patterns across the muscle. In short, a simple morphological alteration can have profound functional effects.

**Biren Patel** of Stony Brook University, pictured above about to get to work on his computer, won the poster award for his work with Kristian Carlson entitled "Subchondral bone mineral density in the distal radius reflects habitual use of the forelimb in sloths and anteaters (Order Xenarthra)". They showed that apparent bone density patterns differ between quadrupedal anteaters and suspensory sloths. This work follows a previous study of non-human primates that showed similar patterns for quadrupedal (e.g., monkeys and African apes) versus suspensory (e.g., orangutans and gibbons) animals, suggesting that bone density patterns can be used to distinguish taxa that regularly load their forelimbs differently. Biren is excited to extend this approach to studying fossil taxa and inferring information on locomotor habits of extinct animals.

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#### Message from the Student/Postdoc Representative

*Russ Main*



This year's meeting in Orlando had a lot to offer the graduate students and post-docs in attendance. Two workshops organized by the SPDAC were held on the last evening of the meeting. The first, "Optimizing Your Graduate School Experience", was paneled primarily by graduate students and post-docs, informing newer members of SICB about how to go about securing funding for their graduate careers outside of teaching, once university stipends run out. The second workshop, "Strategies for Landing an Academic Job", covered strategies students and post-docs can use to land both academic and government jobs. This workshop was paneled by faculty members from various colleges, universities, and government research positions and covered a variety of topics, including what to look for in a department, teaching responsibilities, funding expectations, and lots more. Additionally, Bob Full provided the proceedings with a list of "Qualms and Questions for an Academic Job Interview". This and other materials from the workshop can be found at <http://www.sicb.org/careers/resources.php3>. Thanks to a number of DVM's members who participated in these workshops to help make them a success.

At this year's SPDAC committee meeting, three main topics were discussed. First, we discussed how to make future Grad Student and Post-doc Luncheons fulfill more than just our stomachs. It was suggested that the format of these luncheons be changed to include seating 1–2 faculty member volunteers at a table with 6–8 grad students and post-docs to discuss a range of topics,

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professional, intellectual, and otherwise. Given the success of our faculty–paneled workshop this year, this new format would be incredibly insightful and rewarding for any in attendance, both faculty and students. If you are interested in being a faculty member volunteer for this luncheon at next year's meeting or have comments or suggestions on this proposed format please send me an e–mail.

The second point of discussion was the topic for next year's SPDAC workshop. It was proposed that next year's workshop inform students about the scientific paper submission and review process. This workshop would cover how to find the right journal for your paper, the requirements for submission, how this process might change as more journals move to electronic submission and publication, and addressing reviewers' comments. We envision having this workshop be paneled by members of the editorial boards of different journals representative of the different SICB divisions. If you hold (or have held) an editorial position for any of the following journals (JEB, J. Morph., J. Anat., etc.) and would be willing to represent DVM at this workshop please let me know.

Finally, there was some concern amongst the SPDAC members that more grad students and post–docs should be attending their divisional meetings for the continued health and growth of SICB. It was suggested that each division possibly incorporate a paper and book reprint exchange either before or after the divisional meeting to try to garner larger numbers. If we, as a division, are concerned about increasing the student and post–doc participation at these meetings, this might be something we could try for a half hour, either before or after the divisional meeting. If you have any opinions or suggestions regarding this please let me know.

### SICB–DVM Elections For Divisional Program Officer and Secretary

This year we are holding elections for Program Officer and Secretary. As explained in Beth's message above, both Jeff and I were nominated to run unopposed. If you're a careful reader with an impeccable memory, you might notice that our goals remain unchanged from last spring; this is largely because 1) we really liked our goals, and 2) we haven't been on the job long enough to develop new ones.

Jeffrey A. Walker, PhD



**Current Position.** Assistant Professor of Biology, University of Southern Maine (since 2000) <http://www.usm.maine.edu/~walker/>

**Education.** Ph.D. 1995, Anatomical Sciences, Stony Brook. B.A. 1988, Geology with Honors, University of Pennsylvania;

**Professional Experience.** 1995–2000, Postdoctoral fellowships, Field Museum of Natural History, Chicago.

**Awards and Honors.** NSF Postdoctoral Research Fellowship.

**SICB Activities.** D. Dwight Davis Award judge (2000, 2002–2003); Chair/Co–chair in a locomotion contributed session (every year).

**Research Interests.** Integrative functional morphology, ecology, and evolution. Science methodology, including statistics and modeling.

**Publications.** 26 refereed publications

Five most recent publications:

**Walker, J. A.** 2004. Kinematics and performance of median and paired fins as control surfaces. IEEE Journal of Oceanic Engineering 29, 572–584.

**Westneat, M. W., Thorsen, D. H., Walker, J. A. and Hale, M. E.** 2004. Structure, function and neural control of pectoral fins in fishes. IEEE Journal of Ocean Engineering 29, 674–683.

**Walker, J. A.** 2004. Dynamics of pectoral fin rowing in a fish with an extreme rowing stroke: the threespine stickleback (*Gasterosteus aculeatus*). Journal of Experimental Biology, 207: 1925–1939.

**Ghalambor, C. K., D. N. Reznick, and J. A. Walker.** 2004. Constraints on adaptive evolution: the functional trade–off between reproduction and fast start escape performance in the guppy (*Poecilia reticulata*). American Naturalist, 164:38–50.

**Ghalambor, C. K., J. A. Walker, and D. N. Reznick.** 2003. Multi–trait selection, adaptation, and constraints on the evolution of burst swimming performance. Integrative and Comparative Biology, 43:431–438.

**Goals as Program Officer.** I would like to continue the trend of developing highly integrative contributed sessions and symposia that allow scientists from diverse fields but overlapping interests to learn from each other. Similarly, I would also like to continue the recent practice of scheduling poster sessions that do not compete with either afternoon talks or evening social schedules. Finally, I will schedule senior graduate students and especially postdocs into the better–attended sessions occurring earlier in the week in order to give them and their research increased exposure.



Gary Gillis, PhD



**Current Position.** Assistant Professor of Biology, Mount Holyoke College, South Hadley, MA (since 2002)

[http://www.mtholyoke.edu/acad/biol/g\\_gillis.html](http://www.mtholyoke.edu/acad/biol/g_gillis.html)

**Education.** 1997 Ph.D. Ecology and Evolutionary Biology, University of California, Irvine. 1990 B.S. (Biology), B.A. (History), Magna Cum Laude. Pacific Lutheran University

**Professional Experience.** Present: Assistant Professor of Biological Sciences, Mount Holyoke College; Member of Neuroscience and Behavior Program, Mount Holyoke College; Member, Graduate Program in Organismic and Evolutionary Biology, University of Massachusetts, Amherst  
2001–2002: Postdoctoral Research Associate, Concord Field Station, Harvard University  
1998–2001: N.I.H. Postdoctoral Fellow, Concord Field Station, Harvard University  
1998: Lecturer, U.C. Irvine School of Biological Sciences (Functional Anatomy)  
1990–1991: Biological Technician, Alaska Fisheries Science Center  
1989: Vertebrate Zoology Intern, National Museum of Natural History, Washington D.C.

**Awards and Honors.** 1994: Stoye Award, Best Student Paper in Genetics, Development and Morphology, American Society of Ichthyologists and Herpetologists; 1998–2001: NIH National Research Service Award; 2002–Present: Writer, Outside JEB; 2004 NSF DDIG Advisory Panel

**SICB Activities.** Member 1991–present; D. Dwight Davis Award Committee 1999; DCPB Student Award Committee 2006; co–chair of numerous contributed paper sessions; invited participant in several symposia; published and reviewed papers for American Zoologist and Integrative and Comparative Biology.

**Research Interests.** 1. Biomechanics, functional morphology, and neuromuscular control of vertebrate locomotion  
2. Musculoskeletal design, physiology, and evolution  
3. Ecological and evolutionary transitions between aquatic and terrestrial environments, and their effects on organismal structure and function

**Publications.** 18 refereed publications plus 2 book reviews and 12 popular science contributions

Five most recent publications:

Gillis, G.B., Flynn, J.P. McGuigan, P. and A.A. Biewener. 2005. Patterns of strain and activation in the thigh muscles of goats across gaits during level locomotion. *J. Exp. Biol.* 208:4599–4611

Gillis, G.B. and A.A. Biewener. 2003. The importance of functional plasticity in the design and control of the vertebrate musculoskeletal system. In *Vertebrate Biomechanics and Evolution* (ed. V.L. Bels, J.P. Gasc, and A. Casinos). Bios Scientific Publishers Ltd., Oxford.

Azizi, E., G.B. Gillis and E.L. Brainerd. 2002. Morphology and mechanics of myosepta in swimming salamander (*Siren lacertina*). *Comp. Biochem. Physiol. A.* 133:967–978.

Gillis, G.B. and A.A. Biewener. 2002. Effects of surface grade on proximal hindlimb muscle strain and activation during rat locomotion. *J. Appl. Physiol.* 93:1731–1743.

Ashley–Ross, M.A. and G.B. Gillis. 2002. A brief history of functional morphology. *Integ. and Comp. Biol.* 42: 183–189.

**Other Memberships.** American Physiological Society (APS), American Society for Biomechanics (ASB), Sigma Xi, The Society for Experimental Biology (SEB)

**Goals as Secretary.** I have been an active member of SICB since I started graduate school in 1991. Of all the societal meetings I attend, none comes close to fostering the sort of environment for students that SICB does: the science is great, the social scene(s) good fun, and, perhaps most importantly, you have the opportunities to meet and exchange ideas with people ranging from the president of the society to an undergraduate attending her/his first meeting. As someone that has been pleasantly reaping the benefits of these meetings for close to 15 years, I'd like to start playing a more active role in ensuring that the society continues to put these meetings, and the experiences for students (graduate and undergraduate), at the top of its priority list. I would also like to be sure that we keep an appropriate balance between maintaining our identity as a vital division and resource for all things vert. morph., and coordinating activities with other divisions so as to continue the progress we have been making toward integrating the various approaches and conceptual frameworks central to organismal biology more broadly.

Oh, and one more thing – despite the fact that people tell me I'm going deaf and (I know) my handwriting is one step beyond atrocious, I assure you that, as secretary, I will listen, take notes and communicate ideas with abandon.