Elizabeth R. Dumont

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Research Interests

Functional morphology, ecology and evolution of mammals; ecomorphology of feeding; finite element modeling of biological structures; ecology and evolution of plant-mammal interactions

Education

Ph.D.	1993	S.U.N.Y. at Stony Brook, Anthropology
M.A.	1989	S.U.N.Y. at Stony Brook, Anthropology
B.A.	1985	Indiana University (Bloomington), Anthropology (with honors)

Academic Positions

2001 - present	Assistant Professor, Department of Biology and Graduate Program in Organismic and Evolutionary Biology, University of Massachusetts, Amherst
2001 - present	Curator of Mammals, Massachusetts Museum of Natural History
1996 - 2001	Assistant Professor, Department of Anatomy, Northeastern Ohio Universities College of Medicine (Rootstown, OH)
1996 - present	Research Associate, Section of Mammals, Carnegie Museum of Natural History **(**Pittsburgh PA)
1993 - 1996	Postdoctoral Teaching Fellow, Department of Neurobiology, University of Pittsburgh, School of Medicine

Grant Support and Awards

2005 - 2007	**National Science Foundation** ($333,076), Division of Integrative Organismal Biology, “Finite element analyses of the mammalian skull: The impact of biting behavior.”
1999 - 2002	**National Science Foundation** ($238,150), Ecological and Evolutionary Physiology Program, “The ecomorphology of mammalian frugivores: A test of congruence between cranial morphology and feeding behavior.” This award included one REU supplement.
1999 - 2000	**National Science Foundation** ($ 7,955), Doctoral Dissertation Improvement Grant with doctoral student Christopher Nicolay. “The ecomorphology of feeding performance in nectar-feeding bats.”
1999	Teacher of the Year - voted by the Northeastern Ohio Universities College of Medicine Class of 2002

1995 - 1998	**National Science Foundation** ($81,500), Ecological and Evolutionary Physiology Program, "The function of nonprismatic enamel in fruit and nectar-feeding mammals: A study of the interplay between dental structure, oral physiology and dietary niche."
1995	University of Pittsburgh Medical School ($1,500), "Salivary chemistry of African fruit- and nectar-feeding bats."
	University of Pittsburgh, Central Research Development Fund ($4,139), "Enamel structure and dietary adaptation in Central American fruit bats."
	Theodore Roosevelt Fund, American Museum of Natural History ($1,650), "Enamel structure and dietary adaptation in Central American fruit bats."
1994	Center for Latin American Studies, University of Pittsburgh ($3,975), "Nonprismatic enamel in Central American fruit bats: an integrative study of dental structure, oral physiology and dietary niche."
1993	Teaching Development Grant, University of Pittsburgh Medical School ($2,500).
1989 - 1991	**National Science Foundation** ($8,054), Doctoral Dissertation Improvement Grant, "Functional and phyletic features of mammalian dental enamel: evidence for primate higher-level relationships." With graduate advisor David W. Krause.
1987	Sigma Xi, Grant in Aid of Research ($300), "Affinities of the Plagiomenidae (Mammalia: Dermoptera?): Enamel ultrastructural evidence."

RESEARCH

Peer-Reviewed Journal Publications (♦ = published with students)

Dumont, E.R. and C.W. Nicolay. In Press. Cross-sectional geometry of the dentary in plant-visiting bats. *Zoology*. ♦

Dumont, E.R., J. Piccirillo, and I.R. Grosse. 2005. Finite element analysis of biting behavior and bone stress in the facial skeletons of bats. *The Anatomical Record*, 293:319-330.

Dumont, E.R., G. W. Weiblen, and J. Winkelmann. 2004. Preferences of fig wasps and fruit bats for figs of functionally dioecious *Ficus pungens*. *Journal of Tropical Ecology*, 20:233-238.

Dumont, E.R. and R. O'Neil. 2004. Fruit hardness, feeding behavior, and resource partitioning in Old World fruit bats (Family Pteropodidae). *Journal of Mammalogy*, 85:8-14. ♦

Vandoros, J. D. and E.R. **Dumont**. 2004. Use of the wings in manipulative and suspensory behaviors during feeding by frugivorous bats. Journal of Experimental Zoology, 301:361-366. ♦

Dumont, E.R. 2004. Patterns of diversity in cranial shape among plant-visiting bats. *Acta Chiropterologica*, 6:59-74.

Dumont, E.R. and A. Herrel. 2003. The effects of gape angle and bite point on bite force in bats. *Journal of Experimental Biology*, 206:2117-2123.

Bonaccorso, F. J., J. R. Winkelmann, E.R. **Dumont**, and K. Thibault. 2002. Home range of *Dobsonia minor* (Pteropodidae): A solitary, foliage-roosting fruit bat in Papua New Guinea. *Biotropica*, 34: 138-146.

Dumont, E.R., S.G. Strait, and A. R. Friscia. 2000. Abderitid marsupials from the Miocene of Patagonia: An assessment of form, function, and evolution. *Journal of Paleontology*, 74(6): 1161-1172. ♦

C. W. Nicolay and E.R. **Dumont**. 2000. An experimental analysis of feeding behavior in a nectarivorous bat, *Syconycteris australis*. *Mammalia*, 64: 155-161. ♦

Dumont, E.R. 1999. The effect of food hardness on feeding behavior in frugivorous bats (Family Phyllostomidae): An experimental study. *Journal of Zoology*, 248: 219-229.

Dumont, E.R., K.R. Etzel, and J.D. Hempel. 1999. Bat salivary proteins segregate according to diet. *Mammalia*, 62: 159-166.

Wood, C.B., E.R. **Dumont**, and A.W. Crompton. 1999. New studies of enamel microstructure in Mesozoic mammals: a review of enamel prisms as a synapomorphy of Mammalia. *Journal of Mammalian Evolution*, 6: 177-214.

Maas, M.C. and E.R. **Dumont**. 1999. Built to last -- A microscopic view of the morphology and evolution of primate dental enamel. *Evolutionary Anthropology*, 8: 133-152.

Dumont, E.R. 1997. Cranial shape in fruit, nectar and exudate feeders: Implications for interpreting the fossil record. *American Journal of Physical Anthropology*, 102: 187-202.

Dumont, E.R. 1997. Salivary pH and buffering capacity in frugivorous and insectivorous bats. *Journal of Mammalogy*, 78:1210-1219.

Dumont, E.R. 1996. Enamel prism morphology in molar teeth of small eutherian mammals. *Scanning Microscopy*, 10: 349-370.

Dumont, E.R. 1996. Variation in quantitative parameters of enamel microstructure as assessed using confocal microscopy. *Archives of Oral Biology*, 41: 1053-1063.

Dumont, E.R. 1995. The effects of sectioning angle on measurements of enamel prisms: Implications for comparative studies. *Archives of Oral Biology*, 40: 959-966.

Dumont, E.R. 1995. Mammalian enamel prism patterns and enamel deposition rates. *Scanning Microscopy*, 9: 429-442.

Dumont, E.R. 1995. Correlations between enamel thickness and dietary adaptation among extant primates and chiropterans. *Journal of Mammalogy*, 76: 1127-1136.

Dumont, E.R. 1986. Mid-facial tissue depths of white children: An aid in facial feature reconstruction. *Journal of Forensic Science*, 31: 1463-1469.

Peer-Reviewed Book Chapters

Dumont, E.R. In Press. The correlated evolution of cranial morphology and feeding behavior in new world fruit bats, In Functional and Ecological Morphology of Bats. T.H. Kunz, G. McCraken, and Z. Akbar (eds).

Dumont, E.R. 2003. Bats and Fruit: An ecomorphological approach. Pp. 398-429 In: Ecology of Bats. T.H. Kunz and B. Fenton (eds). University of Chicago Press, Chicago. [**T**his chapter was a Solicited Review.]

Dumont, E.R. 2000. Cranial morphology and diet in gliding marsupials and flying lemurs. Pp. 249-272 In: Biology of Gliding Mammals. R.L. Goldingay and J.S. Scheibe (eds). Filander Press, Fürth.

Dumont, E.R., and T.M. Bown. 1997. New caenolestoid marsupials from Miocene deposits of Colombia. Pp. 207-212 In: Vertebrate Paleontology in the Neotropics: The Miocene Fauna of La Venta, Colombia. R.F. Kay, R.H. Madden, R.L. Cifelli and J.J. Flynn (eds). Smithsonian Institution Press.

Manuscripts in Review

Dumont, E.R. and S. Swartz. Biomechanical approaches and ecological research. In Ecological and Behavioral Methods for the Study of Bats, T.H. Kunz and G. Jones (eds). [**T**his chapter was a Solicited Review.]

Manuscripts in Preparation

Dumont, E.R. and T. Garland. How to eat a fig: The evolution of frugivory in bats. American Naturalist.

Dumont, E.R. and G.D. Weiblen. Dimorphism in attractive and nutritional properties of functionally dioecious figs in New Guinea. Biotropica.

Conference/Symposium Presentations (last five years only; ♦ = co-authored with students)

Dumont, E.R., J. Piccirillo, and I.R. Grosse. 2005. Morphology meets engineering: Finite element analysis of biting behavior in bat. Annual Meetings of the Society for Integrative and Comparative Biology.

Dumont, E.R. 2004. Feeding behavior, bite force and the trophic ecology of fruit bats. Society for Experimental Biology, Edinburgh, UK.

Dumont, E.R., and I.R. Grosse. 2004. Bite force and bone strain in the facial skeletons of bats. International Congress on Vertebrate Morphology, Boca Raton, FL.

Dumont, E.R., J. Piccirillo, and I.R. Grosse. 2004. Biting behavior and the biomechanics of

feeding: A finite element analysis. North American Symposium on Bat Research.

Dumont, E.R. 2003. Diversity and constraint in cranial shape among plant-visiting bats. North American Symposium on Bat Research.

Korobov, N.K. and E.R. **Dumont**. 2003. A comparison of the effective region of maximum bite force production in bats. American Symposium on Bat Research. Presented by Korobov. ♦

Dumont, E.R. and A. Herrel. 2002. The effects of gape angle and bite point on feeding performance in bats. North American Symposium on Bat Research.

Dawson, A.E. and E.R. **Dumont**. 2002. Bioacoustics of the nasal cavity of *Hypsignathus monstrosus*. North American Symposium on Bat Research. Presented by Dawson. ♦

Dumont, E.R. 2001. Correlation between morphology and behavior in the evolution of fruit bats. International Bat Research Congress (Kuala Lumpur, Malaysia).

Dumont, E.R. 2001. Fruit bats, fig wasps and the reproductive ecology of figs. North American Symposium on Bat Research.

Dawson. A.E. and E.R. **Dumont**. 2001. The nasal cavity of *Hypsignathus monstrosus*: Adaptations for sound production? North American Symposium on Bat Research. Presented by Dawson. ♦

Invited National and International Symposium Presentations and Departmental Seminars

2005	Brown University, Department of Anatomy
2004	Northeastern University, Department of Biology Society for Experimental Biology, Edinburgh, Scotland International Congress for Vertebrate Morphology, Boca Raton, Florida
2003	Boston University, Department of Biology University of Maine, Department of Biology
2002	Harvard University, Concord Field Station
2001	International Bat Research Congress, Kuala Lumpur, Malaysia
2000	Australasian Bat Research Conference, Tocal, Australia University of Akron, Department of Biology Oklahoma State University, Department of Zoology Smithsonian Tropical Research Institute, Barro Colorado Island, Panama
1999	Marshall University, Keynote Speaker, Sigma Xi Banquet
1998	CSIRO Tropical Forest Research Institute, Atherton, Australia
1997	S.U.N.Y at Stony Brook, Department of Anatomical Sciences
1996	Ohio University, Department of Biological Sciences University of Colorado (Boulder), Department of Biology

University of Costa Rica (San Jose), Department of Biology

Note: These seminars/talks were given in response to a personal invitation from the departmental seminar committee or symposium organizer. For most domestic locations, my travel expenses were paid and I often received a small honorarium. I was not reimbursed for participation in most international meetings. Reimbursements for international travel are uncommon in my field.

Field Experience:

1999 - present	Expedition Leader. Collection of behavioral, biomechanical and ecological data from bats in Panama, Australia, Papua New Guinea, Domincan Republic, and Jamaica.
1995 - 1999	Expedition Leader. Survey of salivary chemistry among bats, marsupials and primates and the collection of data describing the physical and chemical properties their foods in Costa Rica, Panama, Australia, and Papua New Guinea.
1995	Member, Joint Expedition (Carnegie Museum of Natural History and University of Addis Ababa) to conduct a preliminary mammalian biodiversity survey of North-Central Ethiopia.
1989	Member, Joint Expedition (S.U.N.Y. at Stony Brook and Museo de Ciencias Naturales, Buenos Aires) to Argentina to collect Miocene mammals (two expeditions to Chubut and Santa Cruz Provinces, one in January and another in December).

TEACHING

Courses - University of Massachusetts, Amherst

Spring 2005	Co-taught Art Studio Research (Art 497R) with Dr. Patricia Gallis-Assmus. In this experimental collaboration between the Biology and Art Departments, undergraduate students worked independently and in small groups to develop a multimedia science education exhibit. 13 students were enrolled, five from Biology and eight from Art. Tropical Field Biology (Bio 497H), lecture and field component, 3 credits, 29 students. I mentored six field research projects. The course was team-taught with three other faculty members.
Fall 2004	Mammalogy (Bio 548), lecture and lab, 4 credits, 52 students. Biology of Social Issues (Bio 105), 3 credits, 300 students, team-taught with Drs. Mike Dolan and Judy Goodenough.
Spring 2004	Tropical Field Biology (Bio 497H), lecture and field component, 3 credits,

	23 students. I mentored five field research projects. The course was team-taught with three other faculty members.
Fall 2003	Mammalogy (Bio 548), lecture and lab, 4 credits, 63 students.
	Biology of Social Issues (Bio 105), 3 credits, 300 students, team-taught with Drs. Patricia Wadsworth and Judy Goodenough.
Spring 2003	Tropical Field Biology (Bio 497H), lecture and field component, 3 credits, 23 students. I mentored five field research projects. The course was team-taught with three other faculty members.
Fall 2002	Mammalogy (Bio 548), lecture and lab, 4 credits, 61 students. This course was accompanied by entirely new laboratory exercises and an on-line laboratory supplement.
	Biology of Social Issues (Bio 105), lecture, 3 credits, 300 students, team-taught with Drs. Patricia Wadsworth and Judy Goodenough.
Spring 2002	none – one semester release during first year of employment at UMass
Fall 2001	Mammalogy (Bio 548), lecture and lab, 4 credits, 65 students. 34 new lectures were written during this semester.

Courses at Other Universities (prior to employment at UMass)

Northeastern Ohio Universities College of Medicine (1996-2001)
- Human Gross Anatomy (lecturer and laboratory instructor)
- Developmental Medicine (lecturer, normal embryology)
- Mammalian Evolution (guest lecturer)
- Introduction to Physical Anthropology (guest lecturer)
- Problem Based Learning Facilitator

The University of Pittsburgh Medical School (1993-1996)
- Gross Anatomy of the Human Body (member curriculum design group, lecturer, laboratory instructor, problem based learning facilitator)
- Surgical Anatomy (curriculum design and laboratory instruction)
- Gross Anatomy for Graduate Students (curriculum design, lecturer, laboratory instructor)
- Structure, Development, and Function of Specialized Tissue (laboratory instructor, problem based learning facilitator)

Supervision of Undergraduate Research (University of Massachusetts only)

Honors Theses (Major Advisor)

Jamie Green (B.S. in Biology, Spring 2004), "Functional implications of variation in cranial base flexion among bats (Order Chiroptera)". Jamie was supported by the Howard Hughes Junior Fellowship program. Jaime is currently attending Tufts Veterinary School.

Kathryn Lipson (B.S. in Biology, 2003), "Testing the 'triangle of support' model of masticatory function". Kathryn was supported by the Howard Hughes Junior Fellowship

program. Katheryn is currently working toward a Ph.D. at UMass Medical School; her manuscript will be submitted to the Journal of Mammalogy.

Jason Vandoros (B.S. in Biology 2003), "Use of the wings in manipulative and suspensory behaviors by fruit bats". Jason's manuscript was published in the Journal of Experimental Zoology.

Foad Rashek (B.S. in Biology 2003), "Inter– and intra–specific variation in tooth sharpness among fruit bats".

Independent Study Projects

I have supervised 11 undergraduate independent study projects since arriving at UMass in the fall of 2001. These projects have ranged from original laboratory research to detailed review papers and the development of a searchable on-line database. One student was supported through the NSF Undergraduate Mentoring in Environmental Biology (UMEB) program. Another student completed an interdisciplinary Senior Honors Project that combined Biology and Classics. One current student is a Physics major who plans to add a major in Biology and undertake honors thesis research. Of these students, over half were either women or minorities.

Supervision of Graduate Student Research

Major Advisor

Sharlene Santana, entering OEB program in September of 2005
Natasha Korobov, non-thesis M.S. 2004, OEB, UMass Amherst.
Alta Dawson, non-thesis M.S. 2003, OEB, UMass Amherst.
Chris Nicolay, Ph.D. 2001, "Ecological morphology and nectar-feeding performance in flower-visiting bats", Kent State University. (Currently an Assistant Professor, Department of Biology, University of North Carolina, Asheville)

Member, Graduate Committees (past and present)

Doctoral:

Eric Dewar (Ph.D. expected in 2006, OEB, UMass Amherst)
Suzette Stephens (Ph.D. expected in 2005, Forestry and Wildlife, UMass Amherst)
Andrea Ward (Ph.D. 2005, OEB, UMass Amherst)
Tim Koneval (Ph.D. 2003, Biology, UMass Amherst)
Alistair Evans (Ph.D. 2003, Zoology, Monash University, Australia)
Gina Semprebon (Ph.D. 2002, Biology, UMass Amherst)
Scott LeRoy (Ph.D. 1999, Kent State University)
Stephanie Belovitch (Ph.D. 1999, Kent State University)
Rich May (Ph.D. 1997, Kent State University)
Petra Van der Mark (Ph.D. 1997, Kent State University)

Masters:

Reilly O'Neal (M.S. 1999, Kent State University)
Amy Harrison (M.S. 1998, Kent State University)

SERVICE AND PROFESSIONAL ACTIVITIES

Professional Service

2005	Co-Host of the 86th meeting of the American Society of Mammalogists to be held at UMass Amherst, June 19-21, 2006. 550 attendees are expected.
	NSF Panel Member, Doctoral Dissertation Improvement Grants, Division of Integrative Organismal Biology
2003 - present	Member, Scientific Advisory Board, Lubee Bat Conservancy, Gainesville
2003	Consultant to the Rabies Unit at the Center for Disease Control (CDC)
2003 - 2005	Chairman, Board of Directors, North American Symposium on Bat Research (elected Board Member 2001 – 2007)
2003	Chairman, Student Prize Committee, North American Symposium on Bat Research (Committee member since 1998)
2002	Ad Hoc grant reviewer for the National Geographic Society, the Miami Metro Zoo, and the Lubee Foundation
2001	Co-organizer of symposium entitled “New Perspectives in Functional Morphology” 12th International Bat Research Conference (Kuala Lumpur, Malaysia)
1999 - 2001	Member, J.T. Gregory Prize Committee, Society of Vertebrate Paleontology
1996 - present	Ad Hoc reviewer, National Science Foundation, Ecological and Evolutionary Physiology, Integrative Organismal Biology, Physical Anthropology, HOMINID, and Ecology Programs
1992	Co-organizer of symposium entitled "Enamel Microstructure in Mammalian Evolution" Society of Vertebrate Paleontology, (Toronto, Canada)

Service to Journals and Publishers as a Peer Reviewer

Acta Chiropterologica
Anatomical Record
American Journal of Physical Anthropology
American Museum Novitates
Archives of Oral Biology
Biotropica
Evolution
Journal of Experimental Biology
Journal of Human Evolution
Journal of Mammalogy
Journal of Tropical Ecology
Journal of Zoology (London)
Physiological and Biochemical Zoology

Proceedings of the Royal Society of London
Scanning Microscopy
Southeastern Naturalist (Guest Editor)
University of Chicago Press

Professional Associations

American Society of Mammalogists
Association of Tropical Biologists
North American Symposium on Bat Research
Society for Integrative and Comparative Biology

University Service and Outreach (University of Massachusetts only)

2005	Developed collaboration between the Biology Department and the Center for Research in Art and Technology through which undergraduates from the Biology and Art departments worked together to develop a multimedia educational display in Morrill Science Center.
	Member, Institutional Animal Care and Use Committee
	Member, Darwin Fellow Search Committee
	Member, Ad Hoc Faculty Hiring Priority Committee
	Ad Hoc Member, Biology Department Space Committee
	Provided an interview for 'Medical Imaging Magazine', which featured Dumont lab research
	Provided article about Dumont lab research for Strand7 newsletter (Strand7 is a finite element modeling tool manufacturer headquartered in Sydney, Australia)
	Bat education, Girl Scouts
2004 - present	Member, Ad Hoc Collections Committee
2004 - 2007	Member, Personnel Committee
2003	Member, committee to evaluate the OEB preliminary exam experience
	Member, workgroup to develop administrative component of Evolutionary Synthesis Center Pre-Proposal
	Member, Ad Hoc Faculty Hiring Priority Committee
	Expert interview on local bats for the Springfield Herald
	Presentation for 10th grade Career Day, Monson High School
2003 and 2004	Judge, Regional Science Fair
2002 - present	Member, Admissions Committee, Graduate Program in Organismic and Evolutionary Biology

2001 - present	Member, Steering Committee, Graduate Program in Organismic and Evolutionary Biology
2001 and 2003	Seminars for BIOTAP program
2001 - present	Member, Steering Committee, Massachusetts Museum of Natural History
2001 - present	Attendee, OEB Thursday Lunch Discussion Group