

Curriculum Vitae

Mark E. Berres

Postdoctoral Fellow
Department of Genetics
Room B44 Genetics Building
University of Wisconsin-Madison
Madison, WI 53706

markb@ravel.zoology.wisc.edu
<http://ravel.zoology.wisc.edu/sgaap>
608-262-2534

Education:

University of Minnesota - St. Paul, B.S., *summa cum laude*, Genetics and Cellular Biology, 1994.

University of Wisconsin - Madison, Ph.D., Zoology, 2003. *Dissertation*: "The roles of mating system and landscape topography in shaping the genetic population structure of the White-bearded Manakin (*Manacus manacus*) in Trinidad, West Indies".

Relevant Professional Experience:

Acting director, DNA Sequencing Facility, Biotechnology Center, University of Wisconsin – Madison. Fall semester, 2002.

Awards and Fellowships:

Genomic Sciences Training Program postdoctoral traineeship, 2003-04.

College of Letters and Science Teaching Fellow, 2001. A highly competitive, college-wide award recognizing instructors with outstanding teaching abilities.

Doctoral Dissertation Improvement Grant - NSF98-151. Division of Environmental Biology - Systematic & Population Biology. 2000. Population differentiation in a Neotropical lekking forest bird: Do dispersal barriers explain genetic population structure better than isolation by distance?

Frank M. Chapman Memorial Fund, American Museum of Natural History. 1997, 1998. Evolution and conservation genetics of the endangered endemic avifauna of Eastern Brazil.

Research Experience and Interests:

My research interests include a broad range of scientific disciplines including evolutionary biology, population genetics, genomic science, biotechnology and ornithology. I am most interested in understanding how biotic and abiotic processes shape the distribution of genetic variance in natural populations of animals, particularly in birds. However, despite the wide array of powerful genetic technologies currently

available, none are well-suited for use in genetically-uncharacterized organisms. Because of this limitation, I have an equally matched interest in developing and implementing suitable technologies able to acquire genotypes from individuals in natural populations. In my doctoral thesis, I developed a patented technology that eliminated a serious restriction of one such technology, amplified fragment-length polymorphism (AFLP). With this improvement, I demonstrated that peculiarities of juvenile male migration, recruitment and dominance were responsible for the observed genetic population structure in a Neotropical lekking forest bird. Although the implementation of this technology was highly successful in answering a long-standing biological question, the amount of information generated by this technology still remains less than what is possible with microarrays.

My postdoctoral research aims to further develop new methodologies that will enhance the ability to rapidly and more completely genotype any organism. During my tenure as a GSTP fellow, I have two primary research goals. First, I will complete development of a new high-throughput microarray-based genotyping procedure that does not require sequence information to be obtained *a priori*. Second, to improve the relatively poor signal to noise ratio obtained with fluorophore detection schemes, I will incorporate luminescent semiconductor nanocrystals (quantum dots) into microarray detection schemes. Upon completion of these two objectives, I predict unprecedented access to large-scale genotyping efforts not only in traditional model organisms but even in organisms for which no genetic information exists.

Publications:

Berres, M. E. 2004. A male restricted migration-recruitment-dominance process is responsible for the genetic structure observed in White-bearded Manakins (*Manacus manacus*). (submitted to Evolution).

Berres, M. E. and W. R. Engels. 2004. Loss of selectively neutral alleles in small populations of *Drosophila melanogaster*. (submitted to PNAS).

Berres, M. E., Flores, C., and W. R. Engels. 2004. Rapid purification of recombinant *Thermus aquaticus* DNA polymerase I using nickel-nitrilotriacetic acid (Ni-NTA) affinity chromatography. (submitted to Biotechniques).

Berres, M. E., Engels, W. R., and J. A. W. Kirsch. 2004. A method to determine genotypes of AFLP markers by determination of allele copy number. (submitted to Genetics).

Berres, M. E. 2002. Long-term persistence of White-bearded Manakin (*Manacus manacus*) leks in the Arima Valley of Trinidad, West Indies. Studies in Trinidad and Tobago Ornithology (F. E. Hayes and S. A. Temple, eds.). Department of Life Sciences, University of the West Indies, St. Augustine, Occasional Papers 11, 131-138.

Kusano, K., Berres, M. E., and W. R. Engels. 1999. Evolution of the RECQ family of helicases: A drosophila homolog, *Dmblm*, is similar to the human Bloom syndrome gene. Genetics 151 (3) 1027-1039.

McLaughlin, D. J., Frieders, E. M., Berres, M. E., Doubles, J. C., and S. W. Wick. 1996. Immunofluorescence analysis of the microtubule cytoskeleton in the yeast phase of the basidiomycetes *Kriegeria eriophori* and *Septobasidium carestianum*. *Mycologia* 88 (3) 339-349.

Berres, M. E., Szabo, L. J., and D. J. McLaughlin. 1995. Phylogenetic relationships in auriculariaceous basidiomycetes based on 25S ribosomal DNA sequences. *Mycologia* 87 (6) 821-840.

McLaughlin, D. J., Berres, M. E., and L. J. Szabo. 1995. Molecules and morphology in basidiomycete phylogeny. *Canadian Journal of Botany* 73 (Supplement 1) S684-S692.

Commercial Patents:

Method of genotyping by hybridization of uniformly-sized nucleic acid fragments. 2003. In review (WARF).

Method of genotyping by determination of allele copy number. 2001. P00328US (WARF)

Presentations at Scientific Meetings:

Detection of specific DNA sequences with bio-conjugated luminescent semiconductor nanocrystals (quantum dots). 2003. 44th Annual *Drosophila* Research Conference.

Biallelic discrimination of genotypes with enhanced resolution. 2001. 113th Meeting of the American Ornithologists Union.

Loss of selectively neutral alleles in small populations of *Drosophila Melanogaster*. 1997. 38th Annual *Drosophila* Research Conference.

Memberships:

Genetics Society of America
American Ornithologists Union

Teaching Experience:

Department of Zoology, University of Wisconsin - Madison
Zoology 152. Introductory Biology (five semesters)
Zoology 520/521. Ornithology/Field Ornithology (seven semesters).

Relevant Coursework: