

Beth L. Dumont, Ph.D.

Curriculum Vitae

Assistant Professor
The Jackson Laboratory
600 Main Street
Bar Harbor, ME 04609

p: (207) 288-6647
e: beth.dumont@jax.org
w: www.jax.org

EDUCATION

University of Wisconsin Ph.D., Laboratory of Genetics	Madison, WI 2005-2010
Cornell University BA, <i>Summa Cum Laude</i> , Biology and Anthropology	Ithaca, NY 2001- 2005

ACADEMIC APPOINTMENTS

Primary

The Jackson Laboratory Assistant Professor	Bar Harbor, ME Oct 2016 - current
North Carolina State University, Dept. of Biological Sciences Distinguished Postdoctoral Research Fellow	Raleigh, NC Mar 2013-July 2016
University of Washington, Dept. of Genome Sciences Senior Research Fellow in the Laboratory of Dr. Evan Eichler	Seattle, WA Dec 2010-Dec 2012

Secondary

Tufts University Assistant Professor, Graduate School of Biomedical Sciences Member, Genetics Graduate Program	Boston, MA 2017-current 2019-current
University of Maine Adjunct Assistant Professor, Graduate School of Biomedical Science and Engineering	Orono, ME 2017-current

LEADERSHIP AND SERVICE

The Jackson Laboratory

Education Training Committee	2022-current
JAX-Track Tufts PhD Program, Student Advisor	2021-current
JAX Scholar Selection Committee, <i>ad hoc member</i>	2022
Scientific Advisory Committee	2019-2020; 2022-2023
• Faculty Member	2019; 2022-2023
• Bar Harbor Committee Co-chair	2020
Genetic Diversity Initiative, Working Group Member	2020-current
JAX Student Scientific Symposium	
• Organizing Committee Member	2017-2018, 2020
• Organizing Committee Co-chair	2019
JAX-Track Tufts PhD Program, Admissions Committee Member	2017-2021

JAX-Track University of Maine Graduate Program in Biomedical Science and Engineering, Admissions Committee Member	2021-current
Bar Harbor Childcare Committee Member	2019-current
Research Grants Committee, <i>ad hoc</i> reviewer	2020-current
Faculty Candidate Triage Committee	2018-2020

Tufts University

Tufts Graduate School of Biomedical Sciences Awards Committee	2019-2022
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Professional

Secretariat Member, The International Mammalian Genome Society	2022-2024
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Nominations and Elections Committee Member The International Mammalian Genome Society	2019-2020
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Symposium Co-organizer

- Society for the Study of Evolution, Annual Meeting, Montpellier, France 2018

Review Panels

- National Institute of Child Health and Development, Cellular, Molecular, and Integrative Reproduction Study Section, standing member 2022-2025
- National Institute of Child Health and Development, Cellular, Molecular, and Integrative Reproduction Study Section, *ad hoc* member 2021
- National Science Foundation, Division of Environmental Biology, Evolutionary Processes Cluster 2021
- National Institute of General Medical Sciences, MOSAIC Pathway to Independence Award (K99/R00), *ad hoc* member 2020
- National Institute of General Medical Sciences, Pathway to Independence Award (K99/R00), Special Emphasis Panel, *ad hoc* member 2019
- National Science Foundation, Graduate Research Fellowship Program, Genetics and Proteomics Panel 2016

Strategic Planning Workshops and Council Meetings

- National Institutes of General Medical Sciences Council meeting, *ad hoc* advisor 2021
- Perspectives in Comparative Genomics and Evolution, National Human Genome Research Institute 2019

Ad hoc Grant Reviewer

- National Science Foundation 2015-current
- Israeli Science Foundation 2010

Ad hoc Manuscript Reviewer

2008-current

Science, Nature, Genome Research, Current Biology, Genome Biology, PLoS Genetics, American Journal of Human Genetics, Molecular Biology and Evolution, Genetics, Evolution, Philosophical Transactions of the Royal Society B, Proceedings of the Royal Society of London, PLoS ONE, Proceedings of the National Academy of Sciences, Genome Biology and Evolution, BMC Biology, BMC Genomics, BMC Evolutionary Biology, Journal of Heredity, Chromosoma, G3: Genes Genomes & Genetics, Genes, Royal Society Open Science, Scientific Reports

Professional Society Member

- Society for the Study of Evolution 2006-current
- Society for Molecular Biology and Evolution 2007-current

- American Genetic Association 2011-current
- American Society for Human Genetics 2017-current
- International Mammalian Genome Society 2018-current

TEACHING

The McKusick Short Course, The Jackson Laboratory
Instructor, Genetic Recombination and Mutation 2021

Mammalian Genetics (GENE 205), Tufts University

- Instructor, Recombination and Mutation Module Spring 2022
- Co-director Spring 2020 and Summer 2021
- Instructor, *Chromosome Evolution* Module Spring 2019
- Instructor, *Sex chromosomes* Module Fall 2017

Course Instructor, Creative Retirement Institute, Edmonds Community College 2012
Recent Headlines in Genetics Research

MENTORING

Postdoctoral Scholars

- Dr. Lydia Wooldridge July 2020-current
Supported by a Lalor Fellowship
- Dr. Raman Akinyanju Lawal Dec 2018-July 2022
Supported by a JAX Scholar Award
Current: Computational Scientist, The Jackson Laboratory 2020-2022

PhD Students

- Alexis Garretson, Tufts University May 2021-current
Supported by an NSF Predoctoral Fellowship 2021-2022
Recipient of a SIGHPC Fellowship 2022-current
Supported by a Tufts Dean's Award Fellowship 2022-2023
- Uma Arora, Tufts University May 2018-current
Supported by a T32 Training Grant in Development Genetics 2020-2021
Supported by a F31 Training Award from NCI (scored 5th percentile) 2021-2022

PhD Rotation Students

- Jaycee Choi, Tufts University Fall 2021
- Alexis Garretson, Tufts University Spring 2021
- Madison Armstrong, Tufts University Fall 2020
- Luke Parsley, Tufts University Summer 2019
- Uma Arora, Tufts University Winter 2018

Visiting PhD Students

- Pavla Klusáčková, Masaryk University, PhD Candidate in Zoology Fall 2021

Masters Students

- Brett Haines, University of Maine, Professional Science Masters in Bioinformatics 2020

Postbaccalaureate Students

- Kimberly Heath August 2021-current
Supported by NIH Diversity Supplement (GM133415-04S1)

JAX Summer Student Program Mentor

- Sirohi Kumar Summer 2022

- 2022 recipient of US Presidential Scholar Award
- Clare Mulcahy Summer 2022
- Gabriel McMillen Summer 2021
- Current: undergraduate student in the Doris Duke Program at University of Washington
- Carleigh Charlebois Summer 2019
- 2020 Recipient of a Barry Goldwater Scholarship for her SSP work*
- Shaheer Rizwan Summer 2019
- Current: Medical student, Robert Wood Johnson Medical School
- Francesca Barradale Summer 2017
- Current: PhD candidate in the Molecules, Cells, and Organisms Doctoral Program at Harvard University

College of the Atlantic Academic Year Intern

- Aya Kumagai Fall 2019-Spring 2020

High School Academic Year Interns

- Peyton DiSiena, Somers High School, Amawalk, NY Spring 2021
- Maria Wagenknecht, Ellsworth High School 2018-2019

PhD Thesis Committees

- Rose Besen-McNally, UMaine (PhD Advisor: Ewelina Bolcun-Filas)
- Haley Fortin, Tufts University (PhD Advisor: Christopher Baker)
- Nicholas Tolman, Tufts University (PhD Advisor: Simon John)
- Avery Davis Bell, Harvard University (PhD Advisor: Steve McCarroll)

Postdoctoral Trainee Committees

- Price Dickson, The Jackson Laboratory (Advisor: Elissa Chesler; Current: Marshall University)

Undergraduate Research Mentor

- Dana Truempy, North Carolina State University 2014-2016
- Wesley Sayres, North Carolina State University 2013
- Erin O'Flanagan, University of Wisconsin 2009-2010
- Maxine Lam, University of Wisconsin 2008-2009

Tufts Undergraduate Biology Adjacent Research Program

- Sam Littman 2021-2022

OUTREACH AND PUBLIC EDUCATION

Microbiology Volunteer Instructor, Connors Emerson School, 2nd Grade 2022

JAX High School Open House

- Host a Lunch & Learn Table October 2019
- Speaker in Plenary Symposium May 2018

Maine State Science Fair, Solve It! Symposium Speaker, Thomas College, Waterville, ME
The Origins of Genetic Diversity March 2018

Maine Science Festival, Five-minute Genius Symposium, Bangor, Maine
Exploiting Nature's Exceptions as Models of Human Health and Disease March 2018

Public outreach lecture, University of Wisconsin October 2008
Genetic Recombination, Meiosis, and Aneuploidy

MEDIA COVERAGE AND INTERVIEWS

Quoted Scientist, Proceedings of the National Academy of Sciences, News Feature, vol. 115:3196-3199.
What happens when lab animals go wild. By Carolyn Beans March 2018

HONORS AND AWARDS

Inaugural Recipient of the Mary Lyon Award 2018
From The International Mammalian Genome Society

NIGMS K99/R00 Pathway to Independence Award Recipient 2014-2019

Conference Travel Awards

- The Allied Genetics Conference, The Genetics Society of America, Washington, DC 2020
- The Allied Genetics Conference, The Genetics Society of America, Orlando, FL 2016
- Meeting of the Society for Molecular Biology and Evolution, Chicago, IL 2013
- Annual President's Symposium for the American Genetics Association, Iowa City, IA 2009

NSF Predoctoral Fellowship 2007-2010

Phi Beta Kappa 2005-current

The Jackson Laboratory Summer Student Program 2002
Mentored by Dr. Malcolm Lyons in Dr. Beverly Paigen's Laboratory

Cornell University Dean's List, all semesters 2001-2005

CURRENT RESEARCH SUPPORT

R35 Maximizing Investigators' Research Award Aug 2019-July 2024
National Institute of General Medical Sciences, National Institutes of Health
Evolutionary Genomics of Functional Chromatin Domains
Role: PI
Estimated Total Award Amount: \$2,125,000 (\$1,250,000 direct)

Faculty Early Career Development Program (CAREER) Mar 2020-Feb 2024
National Science Foundation, Division of Environment Biology, Evolutionary Processes Cluster
CAREER: Evolution and Genetic Control of Variation in Meiotic Recombination
Role: PI
Estimated Total Award Amount: \$1,367,952 (\$855,697 direct)

COMPLETED RESEARCH SUPPORT AND FELLOWSHIPS

The Jackson Laboratory Director's Innovation Fund 2018-2022
Into the Wild: Selecting Founder Strains for the Next Generation of JAX Diversity Resources
Role: PI
Estimated Total Award Amount: \$376,804

K99/R00 Pathway to Independence Award 2014-2019
National Institute of General Medical Sciences, National Institutes of Health GM110332
Mechanisms of Recurrent, Parallel Loss of X/Y Pairing and Recombination at Meiosis in Voles
Total Award Amount: \$910,556 (\$164,395 awarded in K99-phase)

University of Washington Genome Sciences Training Grant Postdoctoral Fellowship National Human Genome Research Institute, National Institutes of Health	2011-2012
Doctoral Dissertation Improvement Grant, Co-PI National Science Foundation <i>The Genetic Basis of Recombination Rate Variation in House Mice</i> Total Award Amount: \$15,000	2009-2010 DEB 0909779
Graduate Research Fellowship National Science Foundation	2007-2010
University of Wisconsin Genome Science Training Program Pre-doctoral Fellowship National Human Genome Research Institute, National Institutes of Health (<i>declined</i>)	2007

PUBLICATIONS (h-index=17; 1,685 citations)

In advance-stage preparation

1. Blanco-Berdugo L, **Dumont BL**. Increased rates of genome instability in house mice born using assisted reproductive technologies. Planned submission to *PNAS*.
2. Garretson A, **Dumont BL**. Fitness effects of breeding strategy in house mice are highly heritable and variable across genetic backgrounds. Planned submission to *Nature Communications*.
3. Garretson A, **Dumont BL**, Handel MA. Genetics of Mammalian Gametogenesis: Implications for Human Fertility and Infertility. Invited review to *Development*.

Submitted and preprints

1. Arora UP, Sullivan B, **Dumont BL**. Strain level centromere variation influences CENP-A association dynamics and centromere function. BioRxiv: 2022.05.17.492352; doi: <https://doi.org/10.1101/2022.05.17.492352>
Rejected after external review at *Genome Research*
Currently revising for resubmission to *Cell Genomics*
2. Ashbrook DG, Sasani T, Maksimov M, Gunturkun MH, Ma N, Villani F, Ren Y, Rothschild D, Chen H, Lu L, Colonna V, **Dumont BL**, Harris K, Gymrek M, Pritchard JK, Palmer AA, Williams RW. Private and sub-family specific mutations of founder haplotypes in the BXD family reveal consequences relevant to health and disease. BioRxiv: 2022.04.21.489063; doi: <https://doi.org/10.1101/2022.04.21.489063>
Under review at *Cell Genomics*
3. Wooldridge L, **Dumont BL**. Rapid turnover of the fine-scale recombination landscape in wild house mice. BioRxiv: 2022.06.08.495013; doi: <https://doi.org/10.1101/2022.06.08.495013>
Under review at *Molecular Biology and Evolution*
4. Lawal RA, Mathis VL, Barter ME, Charette JR, Garretson A, **Dumont BL**. Taxonomic assessment of two wild house mouse subspecies using whole-genome sequencing. BioRxiv: 2022.06.28.497812; doi: <https://doi.org/10.1101/2022.06.28.497812>
Under review at *Scientific Reports*

In print

1. Arora UP, **Dumont BL**. (2022) Meiotic drive in house mice: Mechanisms, consequences, and insights for human biology. *Chromosome Research*. <https://doi.org/10.1007/s10577-022-09697-2>.
2. Lawal RA, Arora UP, **Dumont BL**. (2021) Selection shapes the landscape of functional variation in wild house mice. *BMC Biology* 19:239.
3. Haines BA, Barradale F, **Dumont BL**. (2021) Patterns and mechanisms of sex ratio distortion in the Collaborative Cross Mapping Population. *Genetics* 219: iyab136.

PUBLICATIONS (cont.)

4. Arora U, Charlebois C, Lawal RA, **Dumont BL**. (2021) Population and species diversity at mouse centromere satellites. *BMC Genomics* 22: 279.
5. Powers NR, **Dumont BL**, Emori C, Lawal RA, Brunton C, Paigen K, Handel MA, Bolcun-Filas E, Petkov PM, Bhattacharyya T. (2020) Sexual dimorphism in the meiotic requirement for PRDM9 : a mammalian evolutionary safeguard. *Science Advances* 6 : eabb6606.
6. **Dumont BL**. (2020) Is recombination rate variation adaptive? *Curr Biol* 30: PR351-R353.
7. Branca JA, Low BE, Saxl RL, Sargent JK, Doty RA, Wiles MV, **Dumont BL**, Hasham MG. (2020) Loss of TRP53 (p53) accelerates tumorigenesis and changes the tumor spectrum of SJL/J mice. *Genes Cancer* 11:83-94.
8. Wang R, **Dumont BL**, Jing P, Payseur BA. (2019) A first genetic portrait of synaptonemal complex evolution. *PLoS Genetics* 15: e1008337.
9. Moskowitz J, Tracey L, Widmayer S, **Dumont BL**. (2019) Meeting report: 32nd International Mammalian Genome Conference. *Mamm Genome* 30:43-53.
10. Maggiolini FAM, Manganelli M, D'Addabbo P, Cantsilieris S, **Dumont BL**, *et al.* (2019) Genomic inversions and *GOLGA* core duplicons underlie disease instability at the 15q25 locus. *PLoS Genetics* 15: e1008075.
11. **Dumont BL**. (2019) Significant strain variation in the mutation spectrum of inbred laboratory mice. *Mol Biol Evol* 36:865-874.
12. **Dumont BL**, Williams CL, Ng BL, Horncastle V, Chambers CL, McGraw LA, Adams D, Mackay TFC, Breen M. (2018) Relationship between sequence homology, genome architecture, and meiotic behavior of the sex chromosomes in North American voles. *Genetics* 210: 83-97.
13. **Dumont BL**. (2017) X-Chromosome control of genome-scale recombination rates in house mice. *Genetics* 205: 1649-1656.
14. **Dumont BL**. (2017) Meiotic consequences of genetic divergence across the murine pseudoautosomal region. *Genetics* 205: 1089-1100.
15. **Dumont BL**. (2017) Variation and evolution of the meiotic requirement for crossing over in mammals. *Genetics* 205:155-168.
16. Roberts NB, Juntti SA, Coyle KP, **Dumont BL**, Stanley MK, Ryan AQ, Fernald RD, Roberts RB. (2016) Polygenic sex determination in the cichlid fish *Astatotilapia burtoni*. *BMC Genomics* 17:835.
17. **Dumont BL**, Devlin AA, Truempy DM, Miller JC, Singh ND. (2015) No evidence that infection alters global recombination rate in house mice. *PLoS ONE* 10: e0142266.
18. **Dumont BL**. (2015) Interlocus gene conversion explains at least 2.7% of single nucleotide variants in human segmental duplications. *BMC Genomics* 16: 456.
19. **Dumont BL**, Eichler EE. (2013) Signals of historical interlocus recombination in human segmental duplications. *PLoS ONE* 8: e75949.
20. Campbell CD, Chong JX, Malig M, Ko A, **Dumont BL**, Han L, Vives L, O'Roak B, Sudmant P, Abney M, Ober C, Eichler EE. (2012) Estimating human mutation rate using autozygosity in a founder population. *Nat Genet* 44:1277-1281.
21. White MA, Stubbings M, **Dumont BL**, Payseur BA. (2012) Genetics and evolution of hybrid male sterility in house mice. *Genetics* 191:917-934.
22. Borodin PM, Basheva EA, Torgasheva AA, Dashkevich OA, Golenishchev FN, Kartavtseva IV, Mekada K, **Dumont BL**. (2012) Multiple independent evolutionary losses of XY pairing at meiosis in the grey voles. *Chromosome Res.* 20:259-268.
23. **Dumont BL**, Payseur BA. (2011) Genetic analysis of genome-scale recombination rate in house mice. *PLoS Genetics* 7(6): e1002116.

PUBLICATIONS (cont.)

24. **Dumont BL**, Payseur BA. (2011) Evolution of the genomic recombination rate in murid rodents. *Genetics* **187**:643-657.
25. **Dumont BL**, White MA, Steffy B, Wiltshire T, Payseur BA. (2011) Extensive recombination rate variation in the house mouse species complex inferred from genetic linkage maps. *Genome Res.* **21**:114-125.
26. Wong AK, Ruhe AL, **Dumont BL**, Robertson KR, Guerrero G, Shull SM, Ziegler JS, Millon LV, Broman KW, Payseur BA, Neff MW. (2010) A comprehensive linkage map of the dog genome. *Genetics* **184**:595-605.
27. Cox A, Ackert-Bicknell C, **Dumont BL**, Ding Y, Bell, JT, Brockmann GA, Wergedal JE, Bult C, Paigen B, Flint J, Tsaih S-W, Churchill GA, Broman KW. (2009) A new standard genetic map for the laboratory mouse. *Genetics* **182**: 1335-1344.
28. **Dumont BL**, Broman KW, Payseur BA. (2009) Variation in genomic recombination rates among heterogeneous stock mice. *Genetics* **182**: 1345-1349.
29. **Dumont BL**, Payseur BA. (2008) Evolution of the genomic rate of recombination in mammals. *Evolution* **62**: 276-294.
30. Fiumera AC, **Dumont BL**, Clark AG. (2007) Associations between sperm competition and natural variation in male reproductive genes on the third chromosome of *Drosophila melanogaster*. *Genetics* **176**: 1245-1260.
31. Fiumera AC, **Dumont BL**, Clark AG. (2006) Natural variation in male-induced 'cost-of-mating' and allele-specific association with male reproductive genes in *Drosophila melanogaster*. *Phil. Trans. R. Soc. B* **361**: 355-361.
32. Fiumera AC, **Dumont BL**, Clark AG. (2005) Sperm competitive ability in *Drosophila melanogaster* associated with variation in male reproductive proteins. *Genetics* **169**: 243-257.

PRESENTATIONS

Invited Seminars

- Sex-specific Evolution of the Meiotic Recombination Rate. Invited seminar to the virtual MAYosis Meeting, 2021.
- Patterns and Mechanisms of Sex Ratio Distortion in the Collaborative Cross. Invited seminar to the Department of Biology, Bates College, Lewiston, ME, 2020.
- Patterns and Mechanisms of Sex Ratio Distortion in the Collaborative Cross. The 33th International Mammalian Genome Conference, Institute of Genetics and Molecular and Cellular Biology, Strasbourg, France, 2019.
- Decoding the Genomic Landscape of de novo Mutations. Invited seminar to Strategic Planning Workshop hosted by the National Human Genome Research Institute, National Institute of Food and Agriculture, and the National Science Foundation: Perspectives in Comparative Genomics and Evolution, Bethesda, MD, 2019.
- Variation and Genetic Control of Mutation in House Mice. Invited seminar to the Genetics Program, Sackler School of Graduate Biomedical Sciences, Tufts University, Boston, MA, 2019.
- Evolution and Function of the Mammalian Pseudoautosomal Region. The 32th International Mammalian Genome Conference, Mary Lyon Awardee Lecture, Wyndham Grand, Rio Mar, Puerto Rico, 2018.
- Variation and Genetic Control of Mammalian Mutation. Invited seminar to the Genetics Department, University of Georgia, Athens, GA, 2018.

Genetic Control of Genome-Scale Recombination Rates in House Mice. Invited seminar in the Reproduction Seminar Series at Cornell University, Ithaca, NY, 2017.

Evolution and Meiotic Function of the Mammalian Pseudoautosomal Region. The First Annual Jackson Laboratory Scientific Symposium. The Jackson Laboratory, Bar Harbor, Maine, 2017.

Evolution and Meiotic Function of the Mammalian Pseudoautosomal Region. 44th Maine Biological and Medical Sciences Symposium, Mount Desert Island Biological Laboratory, Bar Harbor, Maine, 2017.

X-Chromosome Control of Global Crossover Rates in House Mice. Invited seminar to the Mount Desert Island Biological Laboratory, Bar Harbor, Maine, 2017.

Meiotic Function and Evolution of Mammalian Pseudoautosomal Regions. Invited seminar to the Evening Evolution Group, New York University, 2015.

Gene Conversion and DNA Diversity across Duplications in the Human Genome. Invited seminar to the Department of Biology, University of North Carolina Greensboro, North Carolina, 2015.

Contributed Presentations

Patterns and Mechanisms of Sex Ratio Distortion in the Collaborative Cross. The 33th International Mammalian Genome Conference, Institute of Genetics, Molecular and Cellular Biology, Strasbourg, France, 2019.

Variation and Genetic Control of the Mutation Spectrum in House Mice. Mutation Rate Evolution Meeting, Arizona State University, Tempe, Arizona, 2018.

Variation and Genetic Control of the Mutation Rate Spectrum in House Mice. Annual Meeting of the Complex Trait Consortium, University of Memphis, Memphis, Tennessee, 2017.

X Chromosome Control of Global Crossover Rates in Male and Female House Mice. Genetics Society of America. The Allied Genetics Conference: Marriott World Center, Orlando, FL, 2016.

Defying the Meiotic Paradigm: sex chromosome pairing, recombination and segregation in mammals. American Genetics Association Annual Symposium. Chromosome Evolution: Islandwood Conference Center, Bainbridge Island, Washington, 2015.

Testing the Meiotic Requirement for Crossing-over. Annual Meeting of the Society for the Study of Evolution. Raleigh Convention Center, Raleigh, North Carolina, 2014.

Gene Conversion and DNA Diversity across Segmental Duplications in the Human Genome. Annual Meeting of the Society for Molecular Biology and Evolution. Chicago, Illinois, 2013.

A Next-Generation Recombination Map of the Human Genome. American Genetics Association Annual Symposium. Recombination: Molecular mechanisms and evolutionary consequences. Durham Convention Center, Durham, North Carolina, 2012.

A QTL Map of Intersubspecific Recombination Rate Divergence. Annual Meeting of the Society for Molecular Biology and Evolution. Lyon, France, 2010.

Polymorphism and Divergence in Recombination Rate among House Mice. Evolution of Sex and Recombination: In Theory and Practice. University of Iowa, Iowa City, 2009.

A Comparative Analysis of Recombination Rate Evolution. Annual Meeting of the Society for Molecular Biology and Evolution. Dalhousie University, Halifax, Nova Scotia, Canada, 2007.

The Evolution of Mammalian Recombination Rates. Annual Meeting of the Society for the Study of Evolution. State University of New York, Stony Brook, New York, 2006.