

# CURRICULUM VITAE

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## POSITIONS HELD

Professor, The Jackson Laboratory, Bar Harbor, ME (2003-Present)

Associate Professor, The Jackson Laboratory, Bar Harbor, ME (1998-2003)

Visiting Investigator, The Jackson Laboratory, Bar Harbor, ME (1997-1998)

Associate Professor, Biometrics Unit, Cornell University, Ithaca, NY (1996-1999)

Assistant Professor, Biometrics Unit, Cornell University, Ithaca, NY (1990-1996)

Visiting Assistant Professor, Department of Mathematics, University of Southern California, Los Angeles, CA (1989-1990)

Research Associate, Department of Mathematics, University of Southern California, Los Angeles, CA (1988-1989)

Research Associate, Fred Hutchinson Cancer Research Center, Seattle, WA (1983-1986)

Research Assistant, Department of Psychology, Massachusetts Institute of Technology, Cambridge, MA (1981-1983)

## Adjunct positions

Adjunct Professor, Dept of Genetics, UNC School of Medicine, Chapel Hill, NC (2009-2010)

Graduate Faculty, Sackler School of Graduate Biomedical Science, Tufts University, Boston, MA (2011-Present)

Graduate Faculty, University of Maine, Orono, ME (2005-Present)

## EDUCATION

Ph.D. Biostatistics, University of Washington, Seattle, WA (1988)

Dissertation Title: Stochastic Models for DNA Sequence

S.B. Mathematics, Massachusetts Institute of Technology, Cambridge, MA (1983)

## PROFESSIONAL ACTIVITIES

### Editorial boards

- Senior Editor, *Genetics* (2012- present)
- Associate Editor, *Genome Research* (2010-present)
- Associate Editor, *Mammalian Genome* (2001-present)
- Editor, *Statistical Applications in Genetics and Molecular Biology* (2002-present)
- Associate Editor, *Genetics* (1998-2004, 2011-2012)
- Associate Editor, *Journal of Computational Biology* (1997-2003)
- Associate Editor, *Biometrics* (1997-2000)
- Associate Editor, *Theoretical Population Biology* (1994-2000)

## Advisory Boards

- Advisory Committee Member, Canadian Institute for Advanced Research, CIFAR, (2009-present)
- Scientific Advisory Board: ENCODE Project, NHGRI (2003-2005)
- Scientific Advisory Board: Diabetes Genome Project (DGAP) (2002-2006)
- Scientific Director: Computational Biology Resource, The Jackson Laboratory (2000-present)

## Grant Review Panels/Study Sections

- NIH Human Genome Study Section (1996-2000)

## AWARDS:

- The Ellison Senior Scholar Award (2010)

## TEACHING

- Independent Studies in Computational Biology, Educational Outreach, The Jackson Laboratory, Bar Harbor, ME (2009-present)
- Workshop coordinator and speaker, Systems Genetics Short Course, The Jackson Laboratory, Bar Harbor, ME (2006-present)

## PUBLICATIONS

- Breslow N, Churchill G, Beckwith JB, Fernbach DJ, Otherson HB, Tefft M, D'Angio GJ. 1985. Prognosis for Wilms' tumor patients with nonmetastatic disease at diagnosis--results of the second National Wilms' Tumor Study. *J Clin Oncol* 3:521-531.
- Breslow NE, Churchill G, Nesmith B, Thomas PR, Beckwith JB, Othersen HB, D'Angio GJ. 1986. Clinicopathologic features and prognosis for Wilms' tumor patients with metastases at diagnosis. *Cancer* 58:2501-2511.
- Churchill GA. 1989. Stochastic models for heterogeneous DNA sequences. *Bull Math Biol* 51:79-94.
- Fangman WL, Henly JW, Churchill G, Brewer BJ. 1989. Stable maintenance of a 35-base-pair yeast mitochondrial genome. *Mol Cell Biol* 9:1917-1921.
- Churchill GA, Daniels DL, Waterman MS. 1990. The distribution of restriction enzyme sites in *Escherichia coli*. *Nucleic Acids Res* 18:589-597.
- Navidi WC, Churchill GA, von Haeseler A. 1991. Methods for inferring phylogenies from nucleic acid sequence data by using maximum likelihood and linear invariants. *Mol Biol Evol* 8:128-143.
- Churchill GA. 1992. Hidden Markov chains and the analysis of genome structure. *Comput Chem* 16:107-115.
- Churchill GA, Waterman MS. 1992. The accuracy of DNA sequences: estimating sequence quality. *Genomics* 14:89-98.
- Churchill GA, von Haeseler A, Navidi WC. 1992. Sample size for a phylogenetic inference. *Mol Biol Evol* 9:753-769.
- Anderson JA, Churchill GA, Atrique JE, Tanksley SD, Sorrells ME. 1993. Optimizing parental selection for genetic linkage maps. *Genome* 36:181-186.
- Churchill GA, Giovannoni JJ, Tanksley SD. 1993. Pooled-sampling makes high-resolution mapping practical with DNA markers. *Proc Natl Acad Sci U S A* 90:16-20.
- Navidi WC, Churchill GA, von Haeseler A. 1993. Phylogenetic inference: linear invariants and maximum likelihood. *Biometrics* 49:543-555.
- von Haeseler A, Churchill GA. 1993. Network models for sequence evolution. *J Mol Evol* 37:77-85.
- Churchill GA, Doerge RW. 1994. Empirical threshold values for quantitative trait mapping. *Genetics* 138:963-971.

- Simonsen KL, Churchill GA, Aquadro CF. 1995. Properties of statistical tests of neutrality for DNA polymorphism data. *Genetics* 141:413-429.
- Thorne JL, Churchill GA. 1995. Estimation and reliability of molecular sequence alignments. *Biometrics* 51:100-113.
- Doerge RW, Churchill GA. 1996. Permutation tests for multiple loci affecting a quantitative character. *Genetics* 142:285-294.
- Felsenstein J, Churchill GA. 1996. A hidden Markov model approach to variation among sites in rate of evolution. *Mol Biol Evol* 13:93-104.
- Kelly C, Churchill GA. 1996. Biases in amino acid replacement matrices and alignment scores due to rate heterogeneity. *J Comput Biol* 3:307-318.
- Nachman MW, Churchill GA. 1996. Heterogeneity in rates of recombination across the mouse genome. *Genetics* 142:537-548.
- Schultz TR, Cocroft RB, Churchill GA. 1996. The reconstruction of ancestral character states. *Evolution* 50:504-511.
- Simonsen KL, Churchill GA. 1997. A Markov chain model of coalescence with recombination. *Theor Popul Biol* 52:43-59.
- Beamer WG, Shultz KL, Tennent BJ, Nadeau JH, Churchill GA, Eicher EM. 1998. Multigenic and imprinting control of ovarian granulosa cell tumorigenesis in mice. *Cancer Res* 58:3694-3699.
- Blauth SL, Churchill GA, Mutschler MA. 1998. Identification of quantitative trait loci associated with acylsugar accumulation using intraspecific populations of the wild tomato, *Lycopersicon pennellii*. *Theor Appl Genet* 96(3-4):458-467.
- Beamer WG, Shultz KL, Churchill GA, Frankel WN, Baylink DJ, Rosen CJ, Donahue LR. 1999. Quantitative trait loci for bone density in C57BL/6J and CAST/EiJ inbred mice. *Mamm Genome* 10:1043-1049.
- Blauth SL, Steffens JC, Churchill GA, Mutschler MA. 1999. Identification of QTL's controlling acylsugar fatty acid composition in an intraspecific population of *Lycopersicon pennellii*. *Theor Appl Genetics* 99(1-2):373-381.
- Churchill GA, Lazareva B. 1999. Bayesian restoration of a hidden Markov chain with applications to DNA sequencing. *J Comput Biol* 6:261-277.
- Mahler M, Bristol IJ, Sundberg JP, Churchill GA, Birkenmeier EH, Elson CO, Leiter EH. 1999. Genetic analysis of susceptibility to dextran sulfate sodium-induced colitis in mice. *Genomics* 55:147-156.
- Ripol MI, Churchill GA, da Silva JAG, Sorrells M. 1999. Statistical aspects of genetic mapping in autopolyploids. *Gene* 235:31-41.
- Schultz TR, Churchill GA. 1999. The role of subjectivity in reconstructing ancestral character states: A Bayesian approach to unknown rates, states and transformation asymmetries. *Syst Biol* 48:651-664.
- Upadhyaya P, Churchill G, Birkenmeier EH, Barker JE, Frankel WN. 1999. Genetic modifiers of polycystic kidney disease in intersubspecific KAT2J mutants. *Genomics* 58:129-137.
- Clemens KE, Churchill G, Bhatt N, Richardson K, Noonan FP. 2000. Genetic control of susceptibility to UV-induced immunosuppression by interacting quantitative trait loci. *Genes Immun* 1:251-259.
- Guay-Woodford LM, Wright CJ, Walz G, Churchill GA. 2000. Quantitative trait loci modulate renal cystic disease severity in the mouse bpk model. *J Am Soc Nephrol* 11:1253-1260.
- Kerr MK, Martin M, Churchill GA. 2000. Analysis of variance for gene expression microarray data. *J Comput Biol* 7:819-837.
- Livingstone KD, Churchill G, Jahn MK. 2000. Linkage mapping in populations with karyotypic rearrangements. *J Hered* 91:423-428.
- Morozov P, Sitnikova T, Churchill G, Ayala FJ, Rzhetsky A. 2000. A new method for characterizing replacement rate variation in molecular sequences. Application of the Fourier and wavelet models to *Drosophila* and mammalian proteins. *Genetics* 154:381-395.
- Reifsnnyder PC, Churchill G, Leiter EH. 2000. Maternal environment and genotype interact to

- establish diabetes in mice. *Genome Res* 10:1568-1578.
- Rosen CJ, Churchill GA, Donahue LR, Shultz KL, Burgess JK, Powell DR, Beamer WG. 2000. Mapping quantitative trait loci for serum insulin-like growth factor-1 levels in mice. *Bone* 27:521-528.
- Shpak M, Churchill GA. 2000. The information content of a character under a Markov model of evolution. *Mol Phylogenet Evol* 17:231-243.
- Beamer WG, Shultz KL, Donahue LR, Churchill GA, Sen S, Wergedal JR, Baylink DJ, Rosen CJ. 2001. Quantitative trait loci for femoral and lumbar vertebral bone mineral density in C57BL/6J and C3H/HeJ inbred strains of mice. *J Bone Miner Res* 16:1195-1206.
- Churchill GA, Oliver B. 2001. Sex, flies and microarrays. *Nat Genet* 29:355-356.
- Farmer MA, Sundberg JP, Bristol IJ, Churchill GA, Li R, Elson CO, Leiter EH. 2001. A major quantitative trait locus on chromosome 3 controls colitis severity in IL-10-deficient mice. *Proc Natl Acad Sci U S A* 98:13820-13825.
- Kerr MK, Afsharie CA, Bennett L, Bushel P, Martinez J, Walker N, Churchill GA. 2001. Statistical analysis of a gene expression microarray experiment with replication. *Statistica Sinica* 12:203-218.
- Kerr MK, Churchill GA. 2001. Experimental design for gene expression microarrays. *Biostatistics* 2:183-201.
- Kerr MK, Churchill GA. 2001. Bootstrapping cluster analysis: assessing the reliability of conclusions from microarray experiments. *Proc Natl Acad Sci U S A* 98:8961-8965.
- Kerr MK, Churchill GA. 2001. Statistical design and the analysis of gene expression microarray data. *Genet Res* 77:123-128.
- Kim JH, Sen S, Avery CS, Simpson E, Chandler P, Nishina PM, Churchill GA, Naggert JK. 2001. Genetic analysis of a new mouse model for non-insulin-dependent diabetes. *Genomics* 74:273-286.
- Reeb-Whitaker CK, Paigen B, Beamer WG, Bronson RT, Churchill GA, Schweitzer IB, Myers DD. 2001. The impact of reduced frequency of cage changes on the health of mice housed in ventilated cages. *Lab Anim* 35:58-73.
- Sen S, Churchill GA. 2001. A statistical framework for quantitative trait mapping. *Genetics* 159:371-387.
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- Bouxsein ML, Rosen CJ, Turner CH, Ackert CL, Shultz KL, Donahue LR, Churchill G, Adamo ML, Powell DR, Turner RT, Muller R, Beamer WG. 2002. Generation of a new congenic mouse strain to test the relationships among serum insulin-like growth factor I, bone mineral density, and skeletal morphology in vivo. *J Bone Miner Res* 17:570-579.
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- Wittenburg H, Lyons MA, Li R, Churchill GA, Carey MC, Paigen B. 2003. FXR and ABCG5/ABCG8 as determinants of cholesterol gallstone formation from quantitative trait locus mapping in mice. *Gastroenterology* 125:868-881.
- Bouxsein ML, Uchiyama T, Rosen CJ, Shultz KL, Donahue LR, Turner CH, Sen S, Churchill GA, Muller R, Beamer WG. 2004. Mapping quantitative trait loci for vertebral trabecular bone volume fraction and microarchitecture in mice. *J Bone Miner Res* 19:587-599.
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- DiPetrillo K, Tsaih SW, Sheehan S, Johns C, Kelmenson P, Gavras H, Churchill GA, Paigen B. 2004. Genetic analysis of blood pressure in C3H/HeJ and SWR/J mice. *Physiol Genomics* 17:215-220.
- Grubb SC, Churchill GA, Bogue MA. 2004. A collaborative database of inbred mouse strain characteristics. *Bioinformatics* 20:2857-2859.
- Ishimori N, Li R, Kelmenson PM, Korstanje R, Walsh KA, Churchill GA, Forsman-Semb K, Paigen B. 2004. Quantitative trait loci analysis for plasma HDL-cholesterol concentrations and atherosclerosis susceptibility between inbred mouse strains C57BL/6J and 129S1/SvImJ. *Arterioscler Thromb Vasc Biol* 24:161-166.
- Ishimori N, Li R, Kelmenson PM, Korstanje R, Walsh KA, Churchill GA, Forsman-Semb K, Paigen B. 2004. Quantitative trait loci that determine plasma lipids and obesity in C57BL/6J and 129S1/SvImJ inbred mice. *J Lipid Res* 45(9):1624-1632.
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- Korstanje R, Albers JJ, Wolfbauer G, Li R, Tu AY, Churchill GA, Paigen BJ. 2004. Quantitative trait locus mapping of genes that regulate phospholipid transfer activity in SM/J and NZB/BINJ inbred mice. *Arterioscler Thromb Vasc Biol* 24:155-160.
- Korstanje R, Eriksson P, Samnegard A, Olsson PG, Forsman-Semb K, Sen S, Churchill GA, Rollins J, Harris S, Hamsten A, Paigen B. 2004. Locating Ath8, a locus for murine atherosclerosis susceptibility and testing several of its candidate genes in mice and humans. *Atherosclerosis* 177:443-450.
- Korstanje R, Li R, Howard T, Kelmenson P, Marshall J, Paigen B, Churchill G. 2004. Influence of sex and diet on quantitative trait loci for HDL cholesterol levels in an SM/J by NZB/BINJ intercross population. *J Lipid Res* 45:881-888.
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- Lyons MA, Korstanje R, Li R, Walsh KA, Churchill GA, Carey MC, Paigen B. 2004. Genetic contributors to lipoprotein cholesterol levels in an intercross of 129S1/SvImJ and RIIS/J inbred mice. *Physiol Genomics* 17:114-121.
- Lyons MA, Wittenburg H, Li R, Walsh KA, Korstanje R, Churchill GA, Carey MC, Paigen B. 2004. Quantitative trait loci that determine lipoprotein cholesterol levels in an intercross of 129S1/SvImJ and CAST/Ei inbred mice. *Physiol Genomics* 17:60-68.
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- Ackerman KG, Huang H, Grasemann H, Puma C, Singer JB, Hill AE, Lander E, Nadeau JH, Churchill GA, Drazen JM, Beier DR. 2005. Interacting genetic loci cause airway hyperresponsiveness. *Physiol Genomics* 21:105-111.
- Ahmadiyah N, Churchill GA, Solberg LC, Baum AE, Shimomura K, Takahashi JS, Redei EE. 2005. Lineage is an epigenetic modifier of QTL influencing behavioral coping with stress. *Behav Genet* 35:189-198.
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- Dorward AM, Shultz KL, Horton LG, Li R, Churchill GA, Beamer WG. 2005. Distal Chr 4 harbors a genetic locus (Gct1) fundamental for spontaneous ovarian granulosa cell tumorigenesis in a mouse model. *Cancer Res* 65:1259-1264.
- Li R, Lyons MA, Wittenburg H, Paigen B, Churchill GA. 2005. Combining data from multiple inbred line crosses improves the power and resolution of quantitative trait loci mapping. *Genetics* 169:1699-1709.
- Lyons MA, Korstanje R, Li R, Sheehan SM, Walsh KA, Rollins JA, Carey MC, Paigen B, Churchill GA. 2005. Single and interacting QTLs for cholesterol gallstones revealed in an intercross between mouse strains NZB and SM. *Mamm Genome* 16:152-163.
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- Petkov PM, Graber JH, Churchill GA, DiPetrillo K, King BL, Paigen K. 2005. Evidence of a large-scale functional organization of mammalian chromosomes. *PLoS Genet* 1:e33.
- Reifsnnyder PC, Li R, Silveira PA, Churchill G, Serreze DV, Leiter EH. 2005. Conditioning the genome identifies additional diabetes resistance loci in Type I diabetes resistant NOR/Lt mice. *Genes Immun* 6:528-538.
- Sen S, Satagopan JM, Churchill GA. 2005. Quantitative trait locus study design from an information perspective. *Genetics* 170:447-464.
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