

Curriculum Vitae

Tracy L. Bergemann PhD

Contact Information

Mailing Address

Cardiac Rhythm Disease Management
Medtronic, Inc.
MVS33
8200 Coral Sea St NE
Mounds View, MN 55112

E-mail

tracy.l.bergemann_at_medtronic.com

Phone

(763) 526-0495

<http://www.biostat.umn.edu/~tracyb>

Education

- 1997-2004 Ph.D. in Biostatistics, University of Washington, Seattle, Washington, "Image Analysis and Signal Extraction from cDNA Microarrays"
- 1993-1997 B.S. Statistics/B.A. Mathematics, Winona State University, Winona, Minnesota Graduated Summa cum Laude

Employment

- 2011-present Principal Statistician in Cardiac Rhythm Disease Management at Medtronic
- 2005-2011 Assistant Professor in the Division of Biostatistics within the School of Public Health at the University of Minnesota
- 2010-2011 Graduate faculty in Human Genetics at the University of Minnesota
- 2004-2005 Research Associate at the University of Minnesota Cancer Center
- 2003-2004 Statistical Consultant for Insightful Corporation, development of the S+Gene library with Doug Clarkson, providing comprehensive software for statistical genetics research

Research Interests

- Development of models to test for association/linkage in case-parent triad studies
- Improvements in diagnosis and prognosis for clinical outcomes based on genetic markers such as SNPs, mRNA expression, or protein expression
- Image analysis to extract informative signals and measure signal quality from cDNA microarray studies

Peer-reviewed Publications

24. Ognjanovic, S., Olivier, M., **Bergemann, T.L.**, Hainaut, P. Sarcomas in TP53 Germline Mutation Carriers: a Review of IARC TP53 Mutation Database. *Cancer*, accepted, 2011.
23. **Bergemann, T.L.*** and Wilson J.* Proportion Statistics to Detect Differentially Expressed Genes: a Comparison With Log-ratio Statistics. *BMC Bioinformatics*, **12**(1): 228, 2011. *Both authors contributed equally to this work.
22. Taylor, M., **Bergemann, T.L.**, Hussain, A., Thompson, P.D., Spector, L. Transmission of HLA-DP Variants from Parents to Children with B cell Precursor Acute Lymphoblastic Leukemia: Log-linear Analysis using the Case-parent Design. *Human Immunology*, ePub ahead of print, 2011.
21. Boulware, D.R., Meya, D.B., **Bergemann, T.L.**, Weisner, D.L., Rhein, J., Musubire, A., Lee, S.J., Kambugu, A., Janoff, E.N., and Bohjanen, P.R. Clinical Features and Serum Biomarkers in HIV Immune Reconstitution Inflammatory Syndrome after Cryptococcal Meningitis: A Prospective Cohort Study. *PLoS Medicine*, **7**(12): e1000384, 2010.
20. Boulware, D.R., Meya, D.B., **Bergemann, T.L.**, Williams, D., Vlasova-St Louis, I.A., Rhein, J., Staddon, J., Kambugu, A., Janoff, E.N., and Bohjanen, P.R. Antiretroviral Therapy Down-regulates Innate Antiviral Response Genes in Patients With AIDS in Sub-Saharan Africa. *Journal of Acquired Immune Deficiency Syndromes*, **55**(4): 428-438, 2010.
19. **Bergemann, T.L.** Use of Signal Quality Measurements to Gain Efficiency in the Analysis of cDNA Microarray Data. *Journal of Genetics and Genomics*, **37**(4): 265-279, 2010.
18. Sam-Agudu, N.A., Greene, J.A., Opoka, R.O., Kazura, J.W., Boivin, M.J., Zimmerman, P.A., Riedesel, M.A., **Bergemann, T.L.**, Schimmenti, L.A., and John, C.C. TLR9 Polymorphisms are Associated With Altered IFN- γ Levels in Children With Cerebral Malaria. *American Journal of Tropical Medicine and Hygiene*, **82**(4): 548-555, 2010.
17. **Bergemann, T.L.** and Huang, Z. A New Method to Account for Missing Data in Case-Parent Triad Studies. *Human Heredity*, **68**(4): 268-277, 2009.
16. Starr, T.K., Allaei, R., Silverstein, K.A., Staggs, R.A., Sarver, A.L., **Bergemann, T.L.**, Gupta, M., O'Sullivan, M.G., Matise, I., Dupuy, A.J., Collier, L.S., Powers, S., Oberg, A.L., Asmann, Y.W., Thibodeau, S.N., Tessarollo, L., Copeland, N.G., Jenkins, N.A., Cormier, R.T. and Largaespada, D.A. A Transposon-based Genetic Screen in Mice Identifies Genes Altered in Colorectal Cancer. *Science*, **323**(5922): 1747-1750, 2009.
15. Cooley, S., Trachtenberg, E., **Bergemann, T.L.**, Saeteurn, K., Klein, J., Le, C.T., Marsh, S.G., Guethlein, L.A., Parham, P., Miller, J.S., and Weisdorf, D.J. Donors with Group B KIR Haplotypes Improve Relapse-free Survival after Unrelated Hematopoietic Cell Transplantation for Acute Myelogenous Leukemia. *Blood*, **113**(3): 726-732, 2009.
14. Fermin, D.R., Barac, A., Lee, S., Polster, S.P., Hannenhalli, S., **Bergemann, T.L.**, Grindle, S., Dyke, D.B., Pagani, F., Miller, L.W., Tan, S., Remedios, C., Cappola, T.P., Margulies, K.B. and Hall, J.L. Sex and Age Dimorphism of Myocardial Gene Expression in Nonischemic Human Heart Failure. *Circulation: Cardiovascular Genetics*, **1**: 117-125, 2008.
13. **Bergemann, T.L.**, and Zhao, L.P. Signal Quality Measurements for cDNA Microarray Data. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, **7**(2): 299-308, 2010.
12. Koelle, D.M., and **Bergemann, T.L.** Doctor, Why is my Herpes so Bad? The search continues. *Journal of Infectious Diseases*, **197**(3): 331-334, 2008.
11. Yang, Q., Biernacka, J.M., Chen, M.H., Houwing-Duistermaat, J.J., **Bergemann, T.L.**, Basu, S., Fan, R., Liu, L., Bourgey, M., Clerget-Darpoux, F., Lin, W.Y., Elston, R.C., Cupples, L.A. Summary of GAW15 Group 4: Using Linkage and Association to Identify and Model Genetic Effects. *Genetic Epidemiology*, **31**(Suppl 1): S34-42, 2007.

10. Cooley, S., Xiao, F., Pitt, M., Gleason, M., McCullar, V., **Bergemann, T.L.**, McQueen, K.L., Guethlein, L.A., Parham, P., and Miller, J.S. A Subpopulation of Human Peripheral Blood NK Cells that Lacks Inhibitory Receptors for Self-MHC is Developmentally Immature. *Blood*, **110**(2): 578-586, 2007.
9. Geurts, A.M., Hackett, C.S., Bell, J.B., **Bergemann, T.L.**, Collier, L.S., Carlson, C.M., Largaespada, D.A., and Hackett, P.B. Structure-based Prediction of Insertion-site Preferences of Transposons into Chromosomes. *Nucleic Acids Research*, **34**(9): 2803-2811, 2006.
8. Petryk, A., **Bergemann, T.L.**, Polga, K.M., Ulrich, K.J., Raatz, S.K., Brown, D.M., Robison, L.L., and Baker, K.S. Prospective Study of Changes in Bone Mineral Density and Turnover in Children after Hematopoietic Cell Transplantation. *Journal of Clinical Endocrinology and Metabolism*, **91**(3): 899-905, 2006.
7. Cooley, S., McCullar, V., Wangen, R., **Bergemann, T.L.**, Spellman, S., Weisdorf, D.J., and Miller, J.S. KIR reconstitution is Altered by T cells in the Graft and Correlates with Clinical Outcomes after Unrelated Donor Transplantation. *Blood*, **106**(13): 4370-4376, 2005.
6. **Bergemann, T.L.**, and Clarkson, D.B. Linear Parameter Haplotype Models with Stratification. *Human Heredity*, **59**(4): 201-209, 2005.
5. **Bergemann, T.L.**, Laws, R.J., Quiaoit, F., and Zhao, L.P. A Statistically Driven Approach for Image Segmentation and Signal Extraction in cDNA Microarrays. *The Journal of Computational Biology*, **11**(4): 695-713, 2004.
4. Laws, R.J., **Bergemann, T.L.**, Quiaoit, F., and Zhao, L.P. SignalViewer: Analyzing Microarray Images. *Bioinformatics*, **19**(13): 1716-1717, 2003.
3. Shamberger, R.C., Ritchey, M.L., Haase, G.M., **Bergemann, T.L.**, Loechelt-Yoshioka, T., Breslow, N.E., and Green, D.M. Intravascular Extension of Wilms Tumor. *Annals of Surgery*, **234**(1): 116-121, 2001.
2. Ritchey, M.L., Shamberger, R.C., Haase, G.M., Horwitz, J., **Bergemann, T.L.**, and Breslow N.E. Surgical Complications after Primary Nephrectomy for Wilms' Tumor: Report from the National Wilms' Tumor Study Group. *J Am Coll Surg*, **192**(1): 63-8, 2001.
1. Dome, J.S., Chung, S., **Bergemann, T.**, Umbricht, C.B., Saji, M., Carey, L.A., Grundy, P.E., Perlman, E.J., Breslow, N.E., and Sukumar, S. High Telomerase Reverse Transcriptase (hTERT) Messenger RNA Level Correlates with Tumor Recurrence in Patients with Favorable Histology Wilms' Tumor. *Cancer Research*, **59**: 4301-4307, 1999.

Papers in Peer-reviewed Proceedings

1. **Bergemann, T.L.**, Quiaoit, F., Delrow, J., and Zhao, L.P. Statistical Issues in Signal Extraction from Microarrays. *SPIE Proceedings: Microarrays: Optical Technologies and Informatics* **4266**:24-34, 2001.

Other Publications

- *Proceedings of the 2009 IMS Conference for New Researchers in Statistics and Probability*, ed. by Rajaratnam, B. and **Bergemann, T.L.** Baltimore, MD; published online: <http://www.biostat.umn.edu/~tracyb/ConfProceedingsIMSNRC2009.pdf>.

Unpublished Research

- Basu, S., **Bergemann, T.L.**, Dvorkin, D., Seth, M., Liu, L., Liu, Y.C., Jung, J., Zhong, M., and Fan, R. Combined Linkage and Association Mapping of Quantitative Traits for Rheumatoid Arthritis. Genetic Analysis Workshop 15 paper, 2006.

Papers Submitted

1. **Bergemann, T.L.**, Starr, T.K., Yu, H., Steinbach, M., Chen, Y., Cormier, R.T., Largaespada, D.A., and Silverstein, K.A.T. New Methods for Finding Common Insertion Sites and Co-occurring Common Insertion Sites in Transposon- and Virus-based Genetic Screens. Under revision for *Nucleic Acids Research*, 2011.
2. **Bergemann, T.L.**, Bangirana, P., Giordani, B.J., Boivin, M.J., Connett, J.E., and John, C.C. Statistical Approaches to Assess the Effects of Disease on Neurocognitive Function Over Time. Under revision, 2011.

Research Grant Support

- **Title:** Genetic Epidemiology of Osteosarcoma
 - NIH/NCI
 - Principal investigator: Logan Spector, PhD in the Department of Pediatrics
 - funded for the period 05/01/2007 to 04/15/2011

Using the resources of the Children's Oncology Group (COG), we are conducting the largest and most comprehensive genetic investigation of pediatric osteosarcoma to date. Over a three year period about 500 children diagnosed with OS will be enrolled along with their parents. In this study we will examine 350 variants in three different genetic pathways related to bone growth and DNA integrity.

- **Title:** Pathogenesis of Cognitive/Neurologic Deficits in Central Nervous System Malaria
 - NIH/NINDS
 - Principal investigator: Chandy C John, MD MS in the Division of Pediatric Infectious Diseases
 - funded for the period 04/15/2008 to 04/15/2011

The objective of this application is to define key factors involved in the pathogenesis of cognitive and neurologic sequelae in CNS malaria.

- **Title:** Acute vs. Delayed Iron Therapy: Effect on Iron Status, Anemia and Cognition
 - NIH/NICHHD
 - Principal investigator: Chandy C John, MD MS in the Division of Pediatric Infectious Diseases
 - funded for the period 09/30/2009 to 04/15/2011

The study plans to examine strategies for iron treatment in iron deficient children with malaria.

- **Title:** A Genetic Screen for HCC Genes
 - NIH/NCI
 - Principal investigator: David A Largaespada, PhD in the Department of Genetics, Cell Biology and Development
 - funded for the period 12/15/2009 to 04/15/2011

This proposal describes work done in mice to understand how certain tumors of the liver, called hepatocellular carcinomas (HCC), develop. We will discover what genes, when damaged, can cause these tumors. This will help us decide how best to treat these dangerous forms of cancer. Aims: 1. To perform a Sleeping Beauty transposon-based forward genetic screen for mutations that can induce HCC in either normal or cirrhotic liver; 2. To validate identified candidate HCC oncogenes and tumor suppressors using comparative genomic analysis and Sleeping Beauty-mediated mouse somatic transgenesis.

- **Title:** Trial for the Optimal Timing of HIV Therapy After Cryptococcal Meningitis
 - NIH/NIAID
 - Principal investigator: David R Boulware MD MPH in the Department of Medicine
 - Other Principal investigators: Tracy L Bergemann PhD in the Division of Biostatistics and Kirsten Nielsen in the Department of Microbiology
 - funded for the period 07/15/2010 to 04/15/2011

This grant funds the Cryptococcal Optimal Antiretroviral therapy Timing (COAT) trial. The goal of the trial is to determine, after cryptococcal meningitis (CM), whether early initiation of antiretroviral therapy (ART) prior to hospital discharge results in superior survival compared to standard initiation of ART started as an outpatient. This determination will be made using a randomized treatment strategy trial.

- **Title:** UAB/UMN SPORE in Pancreatic Cancer
 - NIH/NCI
 - Principal investigator: Donald Buchsbaum PhD at the University of Alabama Birmingham
 - Co-principal investigator: Selwyn Vickers MD in the Department of Surgery at the University of Minnesota
 - funded for the period 08/18/2010 to 04/15/2011

The major goal of this SPORE is to greatly strengthen and expand the pancreatic cancer research in a translational direction with an emphasis on gene therapy, death receptor targeted immunotherapy, growth factor mechanisms of chemoresistance, and mechanisms of tumor gene suppression. The third project in the SPORE, entitled Identifying and Targeting Pathways of Pancreatic Cancer Progression and Metastasis, plans to investigate models for pancreatic cancer tumorigenesis and metastasis using Sleeping Beauty transposon-based genetic screens.

- **Title:** Determination of SNP by SNP Interactions in Case Control Studies
 - Grant-in-Aid, University of Minnesota
 - Principal investigator: Tracy L Bergemann, PhD
 - funded for the period 01/01/2009 to 12/31/2010

This study investigates prior information about SNP variants that suggests their importance in models for interaction. The likelihood of a SNP-SNP interaction will be incorporated into appropriate Bayesian variable selection models. Software applications will be published as a public web-based tool that provides information about plausible and detectable SNP-SNP interactions.

Invited Presentations

- Bergemann, T.L. Case-Parent Triad Studies of Genetic Association and Gene-Gene Interaction in the Presence of Missing Data. Medical College of Wisconsin Division of Biostatistics, 2010.
- Bergemann, T.L. The Analysis of Case-Parent Triad Studies: Imputing Missing Data. University of Alabama at Birmingham Department of Biostatistics, Section on Statistical Genetics, 2008.
- Bergemann, T.L. and Spector, L.G. Case-parent Triad Analyses of Genes Related to Bone Growth in Osteosarcoma, University of Minnesota Division of Biostatistics, 2008.
- Bergemann, T.L. and Clarkson, D.B. Joint Estimation of Haplotype Frequencies and Association in Generalized Linear Models. National Cancer Institute, Division of Cancer Epidemiology and Genetics, Biostatistics Branch, 2006.

- Bergemann, T.L. and Zhao, L.P. Signal Quality Measurements for cDNA Microarray Data. University of Minnesota Department of Statistics, 2005.
- Bergemann, T.L. and Clarkson, D.B. Joint Estimation of Haplotype Frequencies and Association in Generalized Linear Models, University of Minnesota Division of Biostatistics, 2005.

Conference Presentations

- Bergemann, T.L. and Deyo-Svendsen, M. Case-Parent Triad Studies of Genetic Association and Gene-Gene Interaction in the Presence of Missing Data. ENAR, 2011.
- Bergemann, T.L. and Deyo-Svendsen, M. Case-Parent Triad Studies of Genetic Association and Gene-Gene Interaction in the Presence of Missing Data. JSM, 2010.
- Bergemann, T.L. The Identification of Mutations Contributing to Tumorigenesis from Transposon-Based Genetic Screens. The Mayo Clinic - University of Minnesota Biostatistics Colloquium, 2009.
- Bergemann, T.L. Imputing Missing Data in Case-Parent Triad Studies. ENAR, 2009.
- Bergemann, T.L. Imputing Missing Data in Case-Parent Triad Studies. JSM, 2008.
- Bergemann, T.L. Model Selection in Case-Parent Triad Studies. BGA, 2007.
- Bergemann, T.L. Estimation of Gene by Exposure Interactions in Case-Parent Triad Studies. JSM, 2006.
- Bergemann, T.L. Estimation of Gene by Exposure Interactions in Case-Parent Triad Studies. IMS 9th Meeting of New Researchers in Statistics and Probability, 2006.
- Bergemann, T.L. and Zhao, L.P. Signal Quality Measurements for cDNA Microarray Data. IBC, 2006.
- Bergemann, T.L. and Zhao, L.P. Signal Quality Measurements for cDNA Microarray Data. ENAR, 2006.

Teaching

- Spring semester 2006-8 *PubH 7402: Biostatistics Modeling & Methods* at the University of Minnesota
- Spring semester 2007-10 *PubH 7406: ANOVA and Design* at the University of Minnesota
- Summer 2000 *Introduction to Dependent Outcome Data* at the University of Washington, TA for Art Peterson, PhD
- 1995-1997 *Calculus I-IV* at Winona State University, TA for Jeff Anderson, PhD
- Fall 1996 & Summer 1995 *Differential Equations* at Winona State University, TA for Jeff Anderson, PhD

Professional Membership

- American Statistical Association
- International Biometric Society
- Children's Oncology Group

Journal Reviews

- Computational Statistics and Data Analysis
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- Journal of Agricultural, Biological, and Environmental Statistics
- Journal of the Royal Statistical Society–C
- Journal of Statistical Planning and Inference
- Statistica Sinica
- Statistics in Medicine
- Bioinformatics
- BMC Bioinformatics
- IEEE/ACM Transactions on Computational Biology and Bioinformatics
- Journal of Genetics and Genomics
- Nucleic Acids Research
- Analytical and Bioanalytical Chemistry
- Diseases of the Colon and Rectum
- Journal of Clinical Oncology
- PLoS One

Other Professional Activities

- 2008-2009 Chair of the organizing committee for the 12th IMS New Researchers' Conference
- 2007-2010 Organizing committee for the IMS New Researchers' Conference
- 2000-2004 Participation in GEMTAG (Genetic Epi/Microarray Technology Affinity Working Group)
- Fall 2000 Participation in the Functional Genomics workshop at the Institute for Pure and Applied Mathematics at UCLA
- 1999-2002 Statistical Consulting for students in the University of Washington Schools of Medicine and Dentistry
- 1998-2001 Research Assistantship with Norm Breslow, providing statistical analysis for the National Wilms Tumor Study.

Honors/Awards

- Delta Omega, inducted 2009
- Graduate School Merit Award, University of Washington, 1997
- Gertude Cox Scholarships Honorable Mention, 1997