

# Natalie Jean Blades

## CONTACT

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## EDUCATION

Ph.D., Biostatistics, Department of Biostatistics, Johns Hopkins School of Public Health, 2002.

Thesis: *Statistical Methods for Serial Analysis of Gene Expression*

Advisor: Giovanni Parmigiani

M.S.E., Department of Mathematical Sciences, Johns Hopkins Whiting School of Engineering, 2001.

A.B. (*magna cum laude*), Mathematics, Wellesley College, 1997.

## POSITIONS

Brigham Young University

Associate Professor, Department of Statistics, 2014–present.

Assistant Professor, Department of Statistics, 2006–2014.

Visiting Assistant Professor, Department of Statistics, Fall 2005.

Johns Hopkins University

Associate, Department of Biostatistics, 2003–present.

The Jackson Laboratory

Post-Doctoral Associate, Laboratory of Gary Churchill, 2002–2005.

## HONORS AND FELLOWSHIPS

1. Recognition for Excellence in Teaching and Mentoring in Statistics, Mu Sigma Rho, Brigham Young University Chapter, 2013.
2. J. Earl Faulkner Award for Outstanding Teaching in Statistics Graduate Courses and Graduate Mentoring, Brigham Young University, 2007, 2009.
3. Margaret Merrell Award for Outstanding Research by a Biostatistics Doctoral Student, Johns Hopkins School of Public Health, 2003.
4. Helen Abbey Award for Excellence in Teaching, Johns Hopkins School of Public Health, 2000.
5. NIMH Psychiatric Biostatistics Training Grant, 1997–2001.
6. Lewis Atterbury Stimson Prize in Mathematics, Wellesley College, 1997.

## PUBLICATIONS

### Refereed:

1. Brookmeyer R, **Blades NJ**, Hugh-Jones M, Henderson DA. The Statistical Analysis of Truncated Data: Application to the Sverdlovsk Anthrax Outbreak. *Biostatistics* 2(2):233–247, 2001.
2. Ness PM, Braine HG, King KE, Barrasso C, Kickler TS, Fuller A, **Blades NJ**. Single Donor Platelets Reduce the Risk of Septic Platelet Transfusion Reactions. *Transfusion* 41(7):857–861, 2001.
3. Brookmeyer R, **Blades NJ**. Prevention of Inhalational Anthrax in the U.S. Outbreak. *Science*. 295: 1861, 2002.
4. Ryu B, Jones J, **Blades NJ**, Parmigiani G, Hollingsworth MA, Hruban RH, Kern SE. Relationships and Differentially Expressed Genes Among Pancreatic Cancers Examined by Large-Scale Serial Analysis of Gene Expression. *Cancer Research* 63(2): 819–826, 2002.
5. Brookmeyer R, **Blades NJ**. Statistical Models and Bioterrorism: Application to the U.S. Anthrax Outbreak. *JASA* 98(464): 781–788, 2003.
6. Lamichhane G, Zignol M, **Blades NJ**, Geiman D, Dougherty A, Grosset J, Broman K, Bishai WR. A Postgenomic Method for Predicting Essential Genes at Subsaturating Levels of Mutagenesis: Application to *Mycobacterium tuberculosis*. *PNAS* 100(12): 7213–7218, 2003.
7. Mikaelian I, **Blades NJ**, Churchill GA, Fancher K, Knowles BK, Eppig JT, Sundberg JP. Proteotypic Classification of Spontaneous and Transgenic Mammary Neoplasms. *Breast Cancer Research* 6(6): R668–79, 2004.
8. Cui X, Hwang JT, Qiu J, **Blades NJ**, Churchill GA. Improved Statistical Tests for Differential Gene Expression by Shrinking Variance Components Estimates. *Biostatistics* 6(1): 59–75, 2005.
9. **Blades NJ**, Grimshaw SD, Pendleton CR. A Simulation-Based Approach For Evaluating Microarray Analyses. *Biostatistics* 11(3): 533–536, 2010.
10. Armour M, Broome M, Del’Anna G, **Blades NJ**, Esson D. A Review of Orbital and Intracranial Magnetic Resonance Imaging (MRI) in 79 canine and 13 feline patients (2004–2010). *Veterinary Ophthalmology*, 14 (4): 215–226, 2011.
11. **Blades NJ**, Schaalje GB. Anticipating the Year 2000: Howard Nielson, BYU, and Statistics. *BYU Studies Quarterly*, 51 (1): 99–117, 2012.
12. Wang V, **Blades NJ**, Ding J, Sultana R, Parmigiani G. Estimation of Sequencing Error Rates in Short Reads. *BMC Bioinformatics*, 13:185, 2012.
13. Grimshaw SD, **Blades NJ**, and Miles M. Spatial Control Charts for the Mean. *Journal of Quality Technology*, 45 (2): 130–148, 2013.
14. Schaalje GB, **Blades NJ**, Funai T. An Open-Set Size-Adjusted Bayesian Classifier for Authorship Attribution. *Journal of the American Society for Information Science and Technology*, 64 (9): 1815–1825, 2013.

### Non-Refereed:

1. **Blades NJ**, Broman KW. Estimating the Number of Essential Genes in a Genome by Random Transposon Mutagenesis. Technical Report MS02-20. Department of Biostatistics. Johns Hopkins University.

2. **Florence Nightingale: Life and Legacy.** Harold B. Lee Library Exhibit. January 2010–January 2011.
3. **Blades NJ.** Review of *The Cambridge Dictionary of Statistics* for *JASA*, 108: 1547, 2013.

**Under Review/In Preparation:**

1. **Blades NJ,** Johnson N, Schaalje GB. Robust Standard Errors for Repeated Measures: Are They All Created Equally. Under revision for resubmission to *The American Statistician*.
2. Schaalje GB, Harding D, Brown T, Coats D, **Blades NJ.** Hidden Sentiment and Internal Structure of the Book of Mormon. Under (2nd) review at *Interpreter*.
3. **Blades NJ,** Prasad J, Schaalje GB. Zero-Inflated Censored Regression: Modeling Episode of Care Data.
4. Alhazmi A, **Blades NJ.** Adaptation and Confirmatory Factor Analysis of the Arabic Version of the PACIC Questionnaire.
5. **Blades NJ,** Enders F. Evaluating the REsearch on Global Regression Expectations in Statistics (REGRESS).

## LECTURES

1. Sidney Kimmel Comprehensive Cancer Center, Gene Expression Methodology Seminar Series, March 2002: "Noise and Shadow: Statistical Methods for SAGE Data."
2. The Jackson Laboratory, March 2002: "Noise and Shadow: Statistical Methods for SAGE Data."
3. Duke University, Institute of Statistics and Decision Sciences, March 2002: "Noise and Shadow: Statistical Methods for SAGE Data."
4. Texas A&M University, Department of Statistics, March 2002: "Noise and Shadow: Statistical Methods for SAGE Data."
5. Institut Pasteur, April 2002: "Estimation of Epidemic Size: Statistical Issues Resulting from Swift Public Health Interventions with Application to Data from the Recent Anthrax Outbreak in the U.S."
6. M.D. Anderson Cancer Center, Department of Biostatistics, September 2002: "Noise and Shadow: Statistical Methods for SAGE Data."
7. SAGE 2003, 4th International SAGE Meeting, Academic Medical Center, Amsterdam, January 2003: "Denoising SAGE Data: Methods for Identification and Removal of Probable Errors."
8. EMBO SAGE Course, Academic Medical Center, Amsterdam, January 2003: "Preprocessing of SAGE Data."
9. ENAR 2003, Tampa, March 2003: "Noise and Shadow: Statistical Methods for SAGE Data."
10. The Jackson Laboratory, Annual Scientific Retreat, May 2003: "Analysis of MPSS Data: Application to LDLR Experiment."
11. The Jackson Laboratory, Short Course on Mathematical Approaches to the Analysis of Complex Phenotypes, October 2003: "Gene Expression with Signature Sequencing."
12. The Jackson Laboratory, Short Course on Gene Microarray Development and Analysis, November 2003: "Gene Expression using MPSS."

13. Roswell Park Cancer Institute, Department of Cancer Genetics, February 2004: "Gene Expression with Signature Sequencing: Modeling Count Data."
14. The Jackson Laboratory, Short Course on Gene Microarray Development and Analysis, April 2004: "Gene Expression using MPSS."
15. IBC 2004, Cairns, Australia, July 2004: "Use of Hidden Markov Models for the Analysis of SNP Data from Mice."
16. Brigham Young University, Department of Statistics, March 2005: "HMM Restoration of Haplotype Structure from Incomplete SNP Data."
17. McGill University, Department of Epidemiology and Biostatistics, March 2005: "HMM Restoration of Haplotype Structure from Incomplete SNP Data."
18. Brigham Young University, Department of Statistics, November 2005: "The Tip of the Anthrax Iceberg: Estimation of Incubation Densities from Truncated Data."
19. Brigham Young University, Department of Statistics, November 2005: "Finding Essential Genes."
20. McGill University, Department of Epidemiology and Biostatistics, October 2005: "Estimation of Number of Essential Genes in a Genome."
21. Brigham Young University, Department of Statistics, November 2006: "Transcriptional Repression by Estrogen Receptors."
22. Southern Utah University, Department of Mathematics, November 2008: "Finding Essential Genes."
23. Brigham Young University, Department of Statistics, March 2009: "Digital Gene Expression: Zipf's Law and Error-Correcting Codes."
24. Brigham Young University, October 2009: "Gateway to Science: Studying Statistics as an Undergraduate."
25. Weber State University, November 2009: "Gateway to Science: Opportunities in Statistics."
26. JSM 2010, August 2010: "Accounting for Student Demographics in the Interpretation of Student Evaluation Data."
27. Utah State University, Department of Mathematics and Statistics Colloquium, April 2011: "Accounting for Student Demographics in the Interpretation of Student Evaluation Data."
28. Expanding Your Horizons Workshop, Orem, UT, March 2012: "Statistics: Become a statistical sleuth!"

## TEACHING

### Courses at Brigham Young:

Principles of Statistics (Stat 121) Fall 2010, Fall 2011, Spring 2013.  
Principles of Statistics (Stat 221) Fall 2009.  
Honors Principles of Statistics (Stat 221H) Fall 2008.  
Introduction to Regression (Stat 330) Winter 2011, 2012, 2013, 2014 (2), Fall 2011, 2012, 2013.  
Statistical Methods I (Stat 336, 6cr) Winter 2009, Winter 2010.  
Statistical Theory II (Stat 442) Winter 2006, Winter 2007, Winter 2008.  
Statistical Inference (Stat 525) Fall 2005, Fall 2006.  
Graduate Seminar in Statistics (Stat 591) Fall 2010, Winter 2011, Fall 2011.  
Probability Theory and Mathematical Statistics I (Stat 641) Fall 2007, 2008, 2009, 2010.  
Probability Theory and Mathematical Statistics II (Stat 642) Winter 2013, Winter 2014.

### Courses at Johns Hopkins:

Statistical Reasoning I (140.611) Summer 2001–2014.  
Statistical Reasoning II (140.612) Summer 2001–2014.

### Short Courses:

Biostatistics II: Biostatistical Modeling, Department of General Practice and Primary Health Care, University of Helsinki Spring 2000–2001.  
Biostatistics, College of Health Sciences, American University of Armenia April 2006.  
Biostatistics, Department of Behavioral Sciences, St. George's University January and July 2005–2014.  
Statistical Methods in Public Health (MPH-502), King Saud University November 2012, 2013.

## ADVISING

### Undergraduate:

#### UNDERGRADUATE MENTORING

Wendy Hiatt Bunn	2005–2006
Kassandra Fronczyk	2005–2006
Heather Ginn Cluff	2005–2006, 2006–2007
Elizabeth Wallman	2005–2006, 2006–2007
Claire Bangerter Owen	2006–2007
Brett Lyons	2006–2007
Natalie Noel Ellison	2009–2010, 2010–2011
Melissa Thompson	2011
Justin Olsen	2012
Jessica Petersen	2013–2014
Darcie Hill	2014

#### UNDERGRADUATE HONORS THESIS COMMITTEE MEMBER

Christa Schank	2011	<i>Determining Genetic Causes of a Simple Mendelian Disease</i>
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## Graduate:

### MS THESIS SUPERVISED

Carly Pendleton	2007	<i>A Simulation-Based Approach to Evaluating Gene Expression Analyses</i>
Wendy Bunn	2007	<i>Sensitivity to Distributional Assumptions in Estimation of the ODP</i>
Kassandra Fronczyk	2007	<i>Informative Priors for Bayesian Analyses of Microarray Data</i>

### MS PROJECT SUPERVISED

Claire Bangerter Owen	2008	<i>Parameter Estimation for the Beta Distribution</i>
Allison Butler	2011	<i>Hierarchical Probit Models for Ordinal Data</i>
Aleena Mosher	2013	<i>Lower Confidence Bounds for Systems Reliability</i>
Jordan Johns	2014	<i>Sitting to Standing: Characterizing Accelerometer Data</i>
Christa Schank	2014	<i>Heart Failure and Cognitive Decline: A Longitudinal Cohort Study</i>

### PhD DISSERTATION COMMITTEE MEMBER

Perpetua Lynne Nielsen	2015
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### MS THESIS/PROJECT COMMITTEE MEMBER

Scott Crawford	2006	<i>Sources of Variability in a Proteomic Experiment</i>
Natalie Johnson	2007	<i>A Comparative Simulation Study of Robust Estimators of Standard Error</i>
Rachel L. Poulsen	2009	<i>XPRIME: A Method Incorporating Expert Prior Information into Motif Searching</i>
Serena Baker	2010	<i>Assessment of aCGH Clustering Methodologies</i>
Bradley Ferguson	2011	<i>Adaptive Threat Detector Testing using Bayesian Gaussian Process Models</i>
Jonathan Christensen	2012	<i>Bayesian Pollution Source Apportionment Incorporating Multiple Simultaneous Measurements</i>
Jordan Pyper	2012	<i>Estimation of the Effects of Parental Measures on Child Wellbeing Using Structural Equation Modeling</i>
Brent Shepherd	2012	<i>Predicting Maximal Oxygen Consumption Levels In Adolescents</i>
Wei Zhou	2012	<i>XPRIME: Eliciting EXpert PRIor Information for Motif Exploration using the Expectation-Maximization Algorithm</i>
Bryan Bradford (Math Ed)	2013	<i>Study of Quantitative Literacy</i>
Kolby Gadd (Math Ed)	2014	<i>Mathematical Knowledge for Teaching and Conceptions of Instruction</i>
Andrew Mathis (Biochemistry)	2015	

## FUNDING

1. NIH-NCI F32 NRSA: "Variability in Gene Expression Experiments." From 12-2003 to 8-2005.
2. Consultant, NSF 10-540 Algorithms for Threat Detection: "Quantitative Methods for Estimating Sequencing Errors." (PI: G Parmigiani, Harvard). From 3-2012 to 2-2015.
3. CPMS HITS: Integrated Cloud Computing in the Statistics Major. 2012–2013.

## PROFESSIONAL SERVICE

American Statistical Association/Utah Chapter.  
Secretary, 2006–2008.

Workshop organizer for Expanding Your Horizons—UVU, March 2012, March 2013.

Referee for *Biometrics*, *Biosecurity and Bioterrorism*, *Statistical Methods in Genetics and Molecular Biology*, *Public Health*, *Bioinformatics*, *JASA*, *JASIST*.

## ACADEMIC SERVICE

### **BYU College of Physical and Mathematical Sciences Committees:**

Member, Curriculum Committee, BYU College of Physical and Mathematical Sciences, 2011–present.

### **BYU Department of Statistics Committees:**

Chair, Statistics 641–642 Curriculum Development Committee, 2005–2006.  
Chair, Writing Course Implementation Subcommittee, Undergraduate Curriculum Committee, 2009–2010.  
Chair, Theory Core Proposal Subcommittee, Undergraduate Curriculum Committee, 2009–2010.  
Chair, Teaching and Learning Subcommittee on Course Learning Outcomes, 2010–2011.  
Chair, Curriculum Committee (2011–2014).  
Chair, Unit Review Subcommittee 6: Program and Students B2—B.S. in Statistical Science, 2011–2012.  
Coordinator, BYU Department of Statistics Seminar Series, Fall 2010, Winter 2011, Fall 2011.  
Member, Undergraduate Curriculum Committee, Unit Review, 2005.  
Member, M.Sc. Comprehensive Exam Committee, 2005–2011, 2013.  
Member, Teaching Resources Committee, 2008–2009.  
Member, Statistics 121/221 Committee, 2008–2013.  
Member, Statistics 121/221 Development Committee, 2009–2010.  
Member, Faculty Search Committee, 2009–2010, 2013–2014.  
Member, Teaching and Learning Subcommittee on Course Learning Outcomes, 2011–2012.  
Member, Unit Review Subcommittee 5: Program and Students B1—M.Sc. Program, 2011–2012.  
Peer Teaching Evaluations, 2008–2009 (3), 2012 (1).

### **Other University Citizenship Activities:**

Member, IMPACT Advisory Board, BYU Department of Mathematics, 2009–2012.  
Co-organizer, Talmage Women (monthly lunch series for female graduate students from Statistics, Math, and Computer Science), 2011–2012.  
Member, Advisory Board, Applied and Computational Mathematics Emphasis, BYU Department of Mathematics, 2013–2014.  
Member, CPMS Teaching Workshop Committee, 2013–2014.