# Rachael Hageman Blair, Ph.D.
# Curriculum Vitae
(updated 11/2022)

Department of Biostatistics
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## Education

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|---|---|
| Ph.D. (2007) | Case Western Reserve University, Cleveland, OH<br>Mathematics (advisor: Daniela Calvetti)<br>Dissertation: *Bayesian methods for large-scale parameter estimation and sensitivity analysis for myocardial metabolism.* |
| M.S. (2006) | Case Western Reserve University, Cleveland, OH<br>Mathematics (advisor: Daniela Calvetti)<br>Thesis: *Iterative methods for blind deconvolution.* |
| B.S. (2002) | State University of New York College at Fredonia, Fredonia, NY<br>Mathematics. |

## Professional Appointments

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| 01/2022 – present | **State University of New York at Buffalo**, Buffalo, NY<br>Institute for Artificial Intelligence and Data Sciences<br>*Associate Director of Education*<br>*Core Member* |
| 07/2019 – present | **State University of New York at Buffalo**, Buffalo, NY<br>Institute for Artificial Intelligence and Data Sciences<br>*Director of the MPS in Data Science and Applications Program* |
| 07/2018 – 2021 | **State University of New York at Buffalo**, Buffalo, NY<br>Department of Biostatistics<br>*Associate Professor*<br><br>Institute for Computational and Data Sciences<br>*Core Member* |
| 01/2018 – 12/2021 | **Baypath University**, Longmeadow, MA<br>Data Science Program<br>*Adjunct Professor* |

08/2011 – 07/2018 **State University of New York at Buffalo**, Buffalo, NY
Department of Biostatistics
*Assistant Professor*

08/2011 – 08/2017 **Roswell Park Cancer Institute**, Buffalo, NY
Department of Biostatistics
*Adjunct Assistant Professor*

## Research Experience & Training

08/2007 – 08/2011 **The Jackson Laboratory**, Bar Harbor, ME
*Postdoctoral Associate* (mentor: Gary Churchill)

- Major projects include statistical methodologies for causal inference, high-throughput data analyses of microarray and quantitative trail loci (QTL) data in collaborations with NIGMS Center for Genome Dynamics

08/2005 – 05/2007 **Case Western Reserve University**, Cleveland, OH
*Research Fellow*

- Department of Mathematics and the NIGMS Center for Modeling Integrated Metabolic Systems (MIMS).

05/2001 – 08/2001 **Worcester Polytechnic Institute**, Worchester, MA
*NSF Undergraduate Research*

- NSF Research Experience for Undergraduates (REU) in collaboration with DEKA Research Corporation.

## Select Teaching Initiatives, Experience & Course Development

01/2022 – present Institute of Artificial Intelligence and Data Science (IAD)
**University at Buffalo,** Buffalo, NY
*Created a new initiative that develops a summer 'short-course' series hosted by the IAD to target graduate students across interdisciplinary programs.*

01/2022 – present Institute of Artificial Intelligence and Data Science (IAD)
**University at Buffalo,** Buffalo, NY
*Created a new initiative that development a fully virtual bootcamp preparation hosted by the IAD to target incoming graduate students across four interdisciplinary programs.*

07/2017 – present **University at Buffalo,** Buffalo, NY
***Developing a new graduate course*** *based on data challenges. The course emphasizes team-based innovation for solving biomedical problems put forth in the DREAM challenges. Course development it funded through the UB Center for Educational Innovation.*

01/2018 – 05/2021 **Baypath University,** Longmeadow, MA
***Developed two new graduate courses*** *in data mining for an online Data Science program. Now serving on program advisory board.*

08/2012 – present **University at Buffalo,** Buffalo, NY
*Instructor: Statistical Data Mining I-II (STA 545 and STA 546)*
***Developed a data mining course series*** *that spans topics in supervised (STA 545) and unsupervised (STA 546) learning. The course follows a hybrid online format, which makes extensive use of video capture, discussion forums, and other organizational tools through UB learns. The course series is now a required component of the Data Science Masters in Engineering and elective in the Computational and Data Enabled Science and Engineering programs.*

08/2007 – 08/2009 **The Jackson Laboratory**, Bar Harbor, ME
*Guest lectures and mentoring for the Summer Student Program in the Center for Genome Dynamics for high-school students from various magnet schools.*

05/2003 – 08/2007 **Case Western Reserve University**, Cleveland, OH
**School of Graduate Studies**
**School of Medicine, Department of Mathematics, Department of Computer Science and Engineering**
*Instructor: Calculus I-III (undergraduate course), Applied Statistics for Engineers (graduate course), Applied Mathematics and Statistics (Summer Medical and Dental Education Program).*
*Taught a variety of math and statistics courses as instructor on record to both undergraduate and graduate students. Full responsibility was assumed for development and delivery of lectures, assignment of homework, exam development, grading, and holding office hours.*

## Professional Awards and Honors

2021 BayPath University, Distinguished Teaching Award
2017 UB School of Public Health and Health Professions - Outstanding Junior Researcher
2016 NLMNIH Travel Award, Pacific Symposium for Biocomputing
2015 SAMSI Ideas/Innovation Lab Participant
2014 UB Individual Development Award, Spring
2013 Department of Biostatistics Award for Teaching Excellence
2012 Department of Biostatistics Award for Teaching Excellence
2008 High Dimensional Statistics in Biology Workshop NIH travel award
2007 SIAM, ICIAM travel award
2007 Joint Mathematics Meeting travel award
2006 SIAM, Conference on the Life Sciences award
2006 European Mathematical Society, Mathematical Models of the Heart travel award
2006 Mathematical Biosciences Institute, Cardiac Workshop travel award
2004 Mathematical Sciences Research Institute, Imaging Workshop travel award
2003 Graduate Dean's Award in Instructional Excellence, Case Western University

## Peer Reviewed Publications

1) Mukherjee M, **Hageman Blair R**, Wang ZQ. (2022) Machine-learning guided elucidation of contribution of individual steps in the mevalonate pathway and construction of a yeast platform strain for terpenoid production. *Metabolic Engineering* (in press): https://doi.org/10.1016/j.ymben.2022.10.004.

2) Liu T, Yu H, **Hageman Blair, R.** (2022) Out-of-bag stability estimation for k-means clustering. *Statistical Data Analysis and Mining* (in press): e1575.

3) Liu T, Yu H, **Hageman Blair, R.** (2022) Stability estimation for unsupervised clustering: A review. *Wiley Interdisciplinary Reviews: Computational Statistics* (2022): e1575.

4) McComb M, **Hageman Blair R**, Lysy M and Ramanathan M (2021) Machine learning-guided, big data-enabled, biomarker-based systems pharmacology: modeling the stochasticity of natural history and disease progression. *Pharmacokinetics and Pharmacodynamics* doi*:* https://doi.org/10.1007/s10928-021-09786-5

5) Lang JK, Karthikeyan B, Quinones-Abranana A, **Hageman Blair R**, Early AP, Levine EG, CS Umesh, Blanco JG, O'Connor T (2021) CBR3 V244M is associated with LVEF reduction in breast cancer patients treated with doxorubicin. *Cardio-Oncology* 7(1): 17. doi: 10.1186/s40959-021-00103-0

6) Tison GH, Avram R, Nah G, Klein L, Klein L, Howard BV, Allison MA, Casanova R, **Hageman Blair R**, Breathett K, Foraker RE, Olgin JE, Parikh NI (2021) Predicting incedent heart failure in women with machine learning: the Women's Health Initiative cohort. *Canadian Journal of Cardiology* 37(11):1708-1714.

*7)* Zhu K, Browne RW, **Hageman Blair R**, Bonner MR, Tian M, Niu Z, Deng F, Farahat Z, Mu L (2021) Changes in arachidonic acid (AA)- and linoleic acid (LA)-derived hydroxy metabolites and their interplay with inflammatory biomarkers in response to drastic changes in air pollution exposure. *Environmental Research.*

8) Tian M., **Hageman Blair, R.,** Mu L., Bonner M., Browne R. and Yu, H. (2021) A framework for stability-based module detection in correlation graphs. *Statistical Analysis and Data Mining,* 1-15. doi: 10.1002/sam.11495

9) Farhat, Z., Hershberger, P.A., Freudenheim, J.L., Mammon, M.M., **Hageman Blair, R.,** Aga, D., and Mu, L. (2021) Types of garlic and their anticancer and antioxidant activity: A review of the epidemiologic and experimental evidence. *European Journal of Nutrition,* 1-25

10) Yu, H. and **Hageman Blair, R**. (2020). Scalable module detection for attributed networks with applications to breast cancer. *Journal of Applied Statistics*, 1-18. Doi: https://doi.org/10.1080/02664763.2020.1803811

11) Cejas, R. B., Wang, J., **Hageman Blair, R**., Liu, S., & Blanco, J. G. (2020). Comparative genome-wide DNA methylation analysis in myocardial tissue from donors with and without Down syndrome. *Gene*, *764*, 145099. Doi: 10.1016/j.gene.2020.145099

12) Bubier, J., Philip, V., Quince, C., Campbell, J., Zhou, Y., Vishnivetskaya, T., Duvvuru, S., **Hageman Blair, R.**, Ndukum, J., Donohue, K.D. Phillips, C., Foster, C.M., Mellert, D.J., Weinstock, G., Culiat, C.T., O'Hara, B.F., Weinstock, G., Culiat, C.T., O'Hara, A.V., Podar, M. and Chesler, E.J. (2020). A microbe associated with sleep revealed by a novel systems genetic analysis of the microbiome of collaborative cross mice. *Genetics* 214(3) 719-733. Doi: https://doi.org/10.1534/genetics.119.303013

13) Yu H, Moharil J, **Hageman Blair R*** (2020) BayesNetBP an R package for probabilistic reasoning in Bayesian Networks. *Journal of Statistical Software* (94) 3, https://doi.org/10.18637/jss.v094.i03. *Senior author - first author graduate student

14) Mu L, Niu Zhongzheng, **Hageman Blair R,** Yu H, Browne RW, Bonner MR, Fanter T, Deng F, Swanson M (2019) Metabolomics profiling before, during and after the Beijing Olympics: a panel study of within individual differences during periods of high and low air pollution 127(5):57010 *Environmental Health Perspectives.*doi: doi: 10.1289/EHP3705

15) Yu H and **Hageman Blair R*** (2019) Integration of probabilistic regulatory networks into constraint-based models of metabolism with applications to Alzheimer's disease. 20 (386) *BMC Bioinformatics* doi: https://doi.org/10.1186/s12859-019-2872-8 *Senior author - first author graduate student

16) Grieshober L, Wactawski-Wende J, **Hageman Blair R,** Mu L, Liu Jingmin, Nie J, Carty C, Hale L, Kroenke C, LaCroix A, Reiner AP, Ochs-Balcom HM (2019) A cross-sectional analysis of telomere length and sleep in the Women's Health Initiative. 188(9): 1616-1626 *American Journal of Epidemiology*. Doi: 10.1093/aje/kwz134

17) Yu H, Chapman B, Di Florio, A, Eischen E, Gotz D, Jacob M, **Hageman Blair R*** (2018) Bootstrapping estimates of stability for clusters, observations and model selection, 1-24 *Computational Statistics*. Doi: https://doi.org/10.1007/s00180-018-0830-y *Senior author - first author graduate student

18) Quiñones-Lombraña A, **Hageman Blair R,** Blanco JG. (2017) Investigation of the role of DNA methylation in the expression of ERBB2 in human myocardium. 628 286-294 *Gene* doi: 10.1016/j.gene.2017.07.058

19) Hao F and **Hageman Blair R*** (2016) A comparative study: classification vs. user-based collaborative filtering for clinical risk prediction. 172(16) *BMC Medical Research Methodology* *Senior author - first author graduate student

20) Hoefer CA*, **Hageman Blair R***, Blanco JG (2016) Development of a CART model to predict the synthesis of cardiotoxic daunorubicinol in heart tissue samples from donors with and without down-syndrome. *Journal of Pharmaceutical Sciences* 105(6) 2005-8. *equal contributions

21) Moharil J, May P, Gaile D, **Hageman Blair R*** (2016) Belief Propagation in Genotype-phenotype networks. *Statistical Applications in Genetics and Molecular Biology* 15(1):39-53. *Senior author - first author graduate student

22) Hoefer CC, Quinones-Lombrana A, **Hageman Blair R,** Blanco JG (2016) Role of DNA methylation on the expression of the anthracycline metabolizing enzyme AKR7A2 in human heart. *Cardiovascular Toxicity* 16(2): 182-192.

23) Farasat A, Nikolaev A, Srihari S, **Hageman Blair R*** (2015) Probabilistic Graphical Models in Modern Social Networks. *Social Network Analysis and Mining* 5(1) 1-18. *Senior author - first author graduate student

24) Griesenhober L., **Hageman Blair R*** (2014) Evaluating performance of link prediction in scale-free evolving networks and a Facebook community. Social Network Analysis and Mining 4(183). * Senior author - first author graduate student

25) Quinnes-Lombrana A, Ferguson D., **Hageman Blair R**, Kalabus JL, Redzematovic A, and Blanco J.G. (2014) Individual variability in the cardiac expression of anthracycline reductases in donors with- and without- Down Syndrome. Pharmaceutical Research 2014; (31)7: 1644-55.

26) Alkakna A, Choi S, Savage H, **Hageman Blair R**, Gu T, Svenson KL, Churchill GA, Hibbs M, Korstaje R. (2012) Pla2g12b and Hpn are genes identified by mouse ENU mutagenesis that affect HDL cholesterol. PLoS One 7(8): e43139.

27) **Hageman Blair R**, Trichler DL, Gaile DP. (2012) Mathematical and Statistical Modeling in Cancer Systems Biology. Frontiers in Physiology 3(227).

28) **Hageman Blair R**, Kliebenstein DJ, Churchill GA. (2012) What can causal networks tell us about metabolic pathways? PLoS Computational Biology 8(4): e10024258.

29) Leduc MS, **Hageman Blair R**, Tsaih SW, Verdugo RA, Walsh K, Churchill GA, Paigen B. (2012) Using bioinformatics and systems genetics to dissect HDL cholesterol genetics in an MRL/MpJ x SM/J intercross. The Journal of Lipid Research 53: 1163-1175.

30) Leduc MS, **Hageman RS**, Tsaih SW, Verdugo RA, Walsh K, Churchill GA, Paigen B. (2011) Integration of QTL and bioinformatic tools to identify candidate genes for triglycerides in an MRL/MpJ x SM/J intercross. The Journal of Lipid Research 52: 1672-1682.

31) **Hageman RS**, Leduc M, Paigen B, Korstanje R, and Churchill GA. (2011) A Bayesian Framework for Inference of the Genotype-Phenotype Map for Segregating Populations. Genetics 187(4): 1163-1170.

32) **Hageman RS**, Leduc MS, Caputo CR, Tsaih SW, Paigen B, Churchill GA, and Korstanje R. (2011) Uncovering Genes and Regulatory Pathways Related to Urinary Albumin Excretion in Mice. Journal of the American Society of Nephrology 22: 73-81. (Selected by the Faculty of 1000 Biology.)

33) Leduc MS, **Hageman RS**, Meng Q, Verdugo RA, Tsaih SW, Churchill GA, Paigen B, Yuan R. (2010) Identification of genetic determinants of IGF-1 levels and longevity among mouse inbred strains. Aging Cell 9(5): 823-836.

34) **Hageman RS**, Wagener A, Hantschel C, Svenson KL, Churchill GA, and Brockmann GA. (2010) High fat diet leads to tissue specific changes reflecting risk factors for diseases in DBA/2J mice. Physiological Genomics 42:55-66.

35) *Calvetti D, ***Hageman R**, *Occhipinti R, and *Somersalo E. (2008) Dynamic Bayesian sensitivity analysis of a myocardial metabolic model. Mathematical Biosciences 212:1-21. * Authors alphabetized with equal contributions

36) *Calvetti D, ***Hageman R**, and *Somersalo E. (2006) Large-scale Bayesian parameter estimation for a three-compartment cardiac metabolism model during ischemia. Inverse Problems 22:1797-1816. * - Authors alphabetized with equal contributions

## Peer Reviewed Conference Proceedings

1. Krishnan K, Shi T, Yu H, **Hageman Blair R.** (to appear: 2023) Integrated graph propagation and optimization with biological applications. *Pacific Symposium on Biocomputing*

2. Yu H and **Hageman Blair R*** (2016) A framework for attribute-based community detection with applications to integrative functional genomics. *Pacific Symposium on Biocomputing* 21:69-90. *Senior author - first author graduate student (rank 3/52 - conferences in Bioinformatics and Computational Biology via Microsoft academic search)

## Book Chapters

1. **Hageman Blair R**, Trichler DL, Gaile DP. (2014) Cancer Systems Biology. In *Recent Advances in Systems Biology*. NovaScience Publishers.

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## Software Development (open source)

1. clusterboot (https://cran.r-project.org/web/packages/bootcluster/index.html)
   Supports stability estimation for clustering (described in Yu. et al. Computational Statistics, 2018)
2. BayesNetBP (https://cran.r-project.org/web/packages/BayesNetBP/index.html )
   Supports probabilistic reasoning in Bayesian Networks that are mixed, discrete and continuous, also has a shiny application interface. (Yu *et al.*, Journal of Statistical Software, 2020).
3. GeneNetBP (https://cran.r-project.org/web/packages/geneNetBP/index.html)
   Supports belief propagation in genotype-phenotype networks (Moharil *et al.*, 2016).
4. wfg (https://cran.r-project.org/web/packages/wfg/index.html)
   Supports community detection with mixed attributes (Yu *et al.*, Journal of Applied Statistics, 2020).

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## Conference Proceedings

1. **Hageman Blair R**, Gaile D. Grabowski J, Kuhlmann D, Markatou M, Tritchler D, Wilding G, Yu G. (2018) *Integrative learning through the data-driven classroom: the DREAM challenge.* AMIA 2018 Informatics educators' forum, New Orleans, LA.

2. Yu H and **Hageman Blair R*** Attribute-based module detection for the elucidation of tissue-specific pathways for oncoimmunology. Topic contributed paper, Joint Statistical Meetings, Baltimore, 2017. *Senior author - first author graduate student

3. Smith RV, McGann D, Gotwals R, Symonds R, **Hageman RS**, Vedell PT, and Churchill GA. (2009) *Independent Studies in Computational Biology*. National Consortium for Specialized Secondary Schools of Math, Science and Technology Journal, 15(1):10-16.

4. Calvetti D, **Hageman RS**, Occhipinti R, and Somersalo E. (2005) *Large-scale statistical parameter estimation during circulatory occlusion*. International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE) proceedings.

5. Calvetti D, **Hageman RS**, Occhipinti R, and Somersalo E. (2005) *Large-scale statistical estimation of metabolic parameters at steady-state.* International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE) proceedings.

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## Select Abstracts from Presentations at Conferences and Meetings (selected from ~50)

2022 Shi T, Yu, H., & **Hageman , R.,** *Integrated regulatory and metabolic networks for the prioritization of therapeutic targets in the tumor microenvironment.* International Society in Computational Biology, Rocky Mountain Bioinformatics Conference, Aspen, CO.

2022 Millen, AE, Zhe, L, McSkimming DI, Maley S, Nalbandyan M, Burns KF, Hageman Blair R, Domalpally A, Kamm KB, Lema G, Rey FE and Mares JA. **Association between the gut microbiome and age-related macular degeneration (AMD) in the 14-year follow-up study to the Carotenoids in Age-related Eye Disease Study (CAREDS2).** Brain and Occular Nutrition (BON) conference. Cambridge, UK.

2022 Shi T, Yu, H., & **Hageman Blair, R.,** *Integrative regulatory and metabolic networks to prioritize therapeutic targets in the tumor microenvironment.* American Statistical Association Upstate Chapters Meeting, Buffalo NY.

2022 Liu T., Yu, H & **Hageman Blair, R.**., *Out-of-bag stability estimation for k-means clustering.* American Statistical Association Upstate Chapters Meeting, Buffalo NY. ** best paper/talk student competition

2022 Jerihio, M & **Hageman Blair, R**., *Controlling the spread of disease with network-based models.* American Statistical Association Upstate Chapters Meeting, Buffalo NY.

2022 **Hageman Blair, R.**,Shi T & Yu, H., *Integrative Statistical Method for High-dimensional omics data.* American Statistical Association Upstate Chapters Meeting, Buffalo NY.

2021 **Hageman Blair, R.**,Tian M & Yu, H., *Characterizing stability in data clustering and community detection in graphical models.* Annual Meeting of the Classification Society, Lewisberg, PA.

2020 Naragon-Gainey, K., Park, J., McMahon, T. P., **Hageman Blair, R.**, & Yu, H., *Predictors and outcomes of perceived emotion regulation success in daily life.* Annual Meeting of the Society for Ambulatory Assessment, Melbourne, Australia.

2019 Yu H and **Hageman Blair R.** Regularized regression by graph propagation for genomic data analysis, JSM, Denver, CO. (poster presentation – Yu H)

2019 Millen A, Hall K, Kamm K, Liu Z, Krajewski B.J., Wactawski-Wende, J, Lema G, **Hageman Blair R**, Sun, Y, and McSkimming D. *Mail-based stool collection in women with and without age-related macular degeneration (AMD)*, ARVO annual meeting, Baltimore, MD. (poster presentation – Millen A)

2018 Asma H, Miller L, Tian M, Wintrob Z, **Hageman Blair R**. *Drosophila embryo structure from transcriptome: 3-D data recovery post derop-seq profiling using 20 genes)*, ISCB-DREAM RECOMB, NY, NY. (poster presentation – students)

2018 Hageman Blair R. (2018) *Module detection in attributed networks for the association with outcomes minisymposium:* Air pollution exposure in metabolomics. ) ISES-ISEE Joint Annual Meeting, Ottawa, CA, (oral presentation)

2017 Yu H and **Hageman Blair R.** BayesNetBP: Probabilistic Reasoning in Bayesian Networks. Complex Traits Consortium, Memphis, TN. (oral presentation – Yu H).

2017 Yu H, Chapman B, DiFlorio A, Eischen E, Jacob M, Gotz D, and **Hageman Blair R**. *Bootstrapping estimates of stability for clusters, observations and model selection*. Upstate Chapters of the American Statistical Association UPSTAT-2017. Buffalo, NY (oral presentation – Yu H) Award: "Best Young Researchers Award", Category A: Methodology – silver award

2017 Grieshober L, Wactawski-Wende J, **Hageman Blair R**, Mu L, Liu K, Nie J, Carty CL, Hale L, Kroenke C, LaCroix AZ, Reiner AP, Ochs-Balcom HM. *Longer sleep duration is associated with longer telomeres: results from the Women's Health Initiative Society for Epidemiologic Research*, Seattle, WA, 2017. (poster – Grieshober L)

2016 **Hageman Blair R**, Chapman B, DiFlorio A, Eischen E, Gotz D, Yu H. *Flexible bootstrapping and analytic approaches towards the clustering of complex medical data. F1000Research* 2016, **5**:2724 (doi: 10.7490/f1000research.1113440.1) B2DK All Hands Meeting, Bethesda MD, 2017. (poster – Hageman Blair R)

2017 **Hageman Blair R***, Chapman B*, DiFlorio A*, Eischen E*, Gotz D*. *Interactive ensemble clustering for medical data with application to mood disorders.* B2DK All Hands Meeting, Bethesda MD, 2017. (poster – Eischen E) *Authors alphabetized with equal contributions

2016 Yu H, Chapman B, DiFlorio A, Eischen E, Jacob M, Gotz D, and **Hageman Blair R**. *Bootstrapping estimates of stability for clusters, observations and model selection*. ISCB Rocky Mountain Bioinformatics Conference, Aspen, CO, 2016. (poster – Yu H)

2016 Moharil J and **Hageman Blair R**. *Probabilistic reasoning in genotype-phenotype networks*. ISCB RSG-DREAM Phoenix, AZ, 2016. (oral presentation – Blair RH)

2016 Tison GH, Nah G, Olgin, J, Vittinghoff E, Howard B, Foraker R, Allison M, Casanova R, **Hageman Blair R**, Breathett K, Klein L, Parikh N. *Identifying novel predictors for incident heart failure using statistical learning techniques in the Women's Health Initiative (WHI) cohort.* AHA Scientific Sessions, New Orleans LA, 2016. (poster – Tison GH)

2016 Yu H and **Hageman Blair R**. *A framework for attribute-based community detection with applications to integrative functional genomics*. Pacific Symposium on Biocomputing, Kona, HI. (oral presentation –Hageman Blair R)

2015 Crowley A, Zhoulin H, **Hageman Blair R**. *Data mining major league baseball's pace of play problem*. New England Symposium on Statistics in Sports, Boston, MA. (poster – Crowley A)

2014 Moharil J., May P, Gaile D., **Hageman Blair R**. *Belief Propagation in Genotype-phenotype networks.* BioMedical Engineering Society (BMES) annual meeting, San Antonio TX. (poster – Moharil J)

2010 **Hageman RS**, Leduc M, Paigen B, Korstanje R, and Churchill GA. *A Bayesian Framework for Inference of the Genotype-Phenotype Map for Segregating Populations.* International conference on Research in Computational Molecular Biology (RECOMB), Lisbon, Portugal. (poster - Hageman RS)

2009 **Hageman RS**, Aljakna A, Svenson KL, Churchill GA and Korstanje R. *Multiple mutations perturb a small number of pathways in an HDL mutagenesis screen.* International Symposium on Atherosclerosis, Newport, RI. (poster – Hageman RS)

2009 **Hageman RS**, Aljakna A, Svenson KL, Churchill GA and Korstanje R. *Multiple mutations perturb a small number of pathways in an HDL mutagenesis screen.* Complex Traits Consortium, Manchester, England, UK. (poster – Hageman RS)

2008 **Hageman RS**, Brockman G and Churchill GA. *Differences in gene expression in the adipose tissues of DBA/2 mice under a high fat diet.* High dimensional statistics in biology workshop, Cambridge, UK. (poster – Hageman RS)

2007 Calvetti D, **Hageman RS** and Somersalo E. *Dynamic Bayesian sensitivity analysis in myocardial metabolism*. International Congress of Industrial and Applied Mathematics (ICIAM), Zurich, Switzerland. (oral presentation – Hageman RS)

2007 Calvetti D, **Hageman RS** and Somersalo E. Bayesian *Large scale dynamic sensitivity analysis in myocardial metabolism.* Joint Mathematics Meeting, New Orleans, LA. (poster – Hageman RS)

2007 Calvetti D, **Hageman RS** and Somersalo E. *Bayesian sensitivity analysis in cardiac metabolism.* Biomedical Engineering Society (BMES): annual meeting, Chicago, IL. (poster – Hageman RS)

2006 Calvetti D, **Hageman RS** and Somersalo E. *Large scale parameter estimation for the dynamic cardiac metabolism during ischemia.* Society for Industrial and Applied Mathematics (SIAM): Conference on the Life Sciences, Raleigh, NC. (oral presentation – Hageman RS)

2007 **Hageman RS**, Kline K, Wilkins L, Larson C. *Modeling the dynamics of a motorized wheelchair*. Joint Mathematics Meeting, San Diego, CA. (poster – Hageman RS)

## Invited Presentations

2021 Controlling networks and predicting optimal sets of perturbations
The Classification Society Annual Meeting
Bucknell University

2021 Stability analysis for clustering problems and community detection in graphical models
Penn State University, Department of Statistics

State College, PA

2019 A probabilistic framework for fusing genetic and metabolic networks with applications to Alzheimer's disease
The Fields Institute for Research in Mathematical Sciences
Toronto, Canada

2019 Bootstrapping the stability of clusters and networks
Fall Eastern Meeting of the American Mathematical Society
Binghamton, NY

2018 Probabilistic reasoning with networks
UB Department of Chemical and Biological Engineering

2018 Biomedical Data Science Education
AMIA Informatics Educator Forum
New Orleans, LA

2017 Attribute-based module detection with applications to integrated functional genomics
AbbVie, Redwood City, CA

2017 Reasoning with Networks
Sage Bionetworks, Seattle, WA

2016 Perturbing Gene Networks
Association of Women in Mathematics, local chapter
Buffalo, NY

2014 Belief Propagation in Genotype-Phenotype Networks
Department of Biological Statistics and Computational Biology (seminar speaker)
Cornell University, Ithaca, NY

2013 SPHHP Online Teaching Symposium
University at Buffalo, School of Public Health

2012 What can causal networks teach us about metabolism?
University at Buffalo, Pharmaceutical Sciences and Neurology.

2011 Modeling Complex Biological Systems.
NC State, Department of Genetics, Raleigh, NC

2011 Toward the in silico cell: Alliance Workshop
Case Western Reserve University, Cleveland, OH.

2011 Markov Chains and Blind Deconvolution
University at Buffalo, Department of Physiology and Biophysics.

2011 Modeling Complex Biological Systems
Roswell Park Cancer Institute, Department of Molecular and Developmental Genetics.

2009 Bayesian Networks in Biology
Humboldt University, School of Agriculture and Horticulture. Berlin, Germany.

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## Professional Service and Development

### External Professional Service

### Journal Service

Reviewer for: *AWM Edge Program, Bioinformatics, BMC Medical Research Methodology, BMC Systems Biology, British Journal of Applied Science and Technology, CRC Press, Taylor & Francis Group*: *Applications in Data Mining Techniques for Oral Cancer Detection and Prevention, IEEE/ACM Transactions on Computational Biology and Bioinformatics, Journal of the American Statistical Association, Journal of Applied Statistics, Molecular BioSystems, Pacific Symposium on Biocomputing, Physiological Genomics, PLoS One, PLoS Computational Biology and Science.*

2011-2012 Review Editor *Frontiers in Genomic Physiology*
2013-2017 Associate Editor *Advances in Systems Biology*

**Conference Related Organization**
2022 ASA UPSTAT 2022 Data Science Panel organizer
2022 ASA UPSTAT 2022 organizing committee & session organizer
2022 UB IAD Days organizing committee
2019-2021 NERCCS 2020 - Organizing program Committee
2018-2020 UB CDSE Days - Organizing program Committee

**Advisory Boards**
2022 Baypath University – External Advisory Board – Data Science

**National Review Panels**
2022 Review Panel NSF DMS Bioinformatics & Computational Biology Innovation Program
2022 Review Panel NSF CISE Information and Intelligent Systems Program
2016 -2022 Review Panel NSF GRFP (Graduate Research Fellowship Program)
2015- 2020 Review Panel NSF DMS Mathematical Biology Program
2014 -2017 Early Career Reviewer Program – NIH Center for Scientific Review
2016 Review Panel DoD Extramural Medical Research: Combat Casualty Care
2015, 2021 Review Panel NSF/NIGMS Interface of the Biological and Mathematical Sciences
2017 Ad hoc reviewer for Center for CTSI Penn State Pilot Study program
2017 Review Panel NSF/Simons Research Foundation - Centers for Mathematics of Complex Biological Systems
2018 Reviewer NSF PGRP Program
2019 Ad hoc reviewer BMRD study section
2019 Review Panel NSF CAREER Mathematical Biology Program

Panel Invitations declined:
2017 Review Panel DoD Therapeutics and Treatment Gulf War Illness program
2018 Review Panel DoD Detection and Diagnosis program

**UB Internal Professional Service**
2022-present Search Committee, UB SEAS Career and Internship Coach
2021-present Search Committee, Chair Position for UB Department of Biostatistics
2021-present Search Committee, UB SEAS Teaching Faculty for Data Science Programs
2019-present Tenure and Promotions Committee, UB School of Public Health and Health Professions
2019-2022 Research Initiatives Committee, UB School of Public Health and Health Professions
2019-present Director MPS Data Science, UB Institute for Computational and Data Science
2019 Undergraduate Curriculum committee, UB Department of Biostatistics
2019 Research Assistant Professor search committee, UB Department of Biostatistics
2019 Data Science and Engineering MS and MPS admissions committee
2018-2019 Seminar Organizer, UB Department of Biostatistics
2018-2019 Search Committee Research Assistant Professor, UB Department of Biostatistics
2018 UB Institute for Computing and Data Sciences committee - SPHHP representative
2017-2018 Faculty Search Committee UB Department of Chemical and Biological Engineering
2016-2017 Faculty Search Committee UB Department of Chemical and Biological Engineering
2016-2017 Search Committee for the Chair of UB Department of Biostatistics

2015-2021 Computational Data Enabled Science and Engineering, participating faculty.
2015-2020 Admissions Committee, UB Department of Biostatistics
2012-present Genetics, Genomics, and Bioinformatics Program, participating faculty.
2012-2017 Department of Biostatistics vision statement committee.
2012-2014 Faculty council
2013-2015 Communications committee
2016 UB IMPACT internal funding, review panel for the life sciences.
2016 UB GEM Biostatistics consultation panel for pilot projects
2016 UB IMPACT Biostatistics consultation panel for pilot projects
2013-2016 Biostatistics graduate admissions committee
2018
2013-2014 Faculty Search Committee Biostatistics/Epidemiology and Environmental Health
2014 SPHHP SPEC Committee
2014 Perry poster day judge
2015 Faculty search committee Biostatistics

**Community Service**

2019 Letters to a pre-scientist "pen pal" program
2019 Inheritance of complex trait through dragon breeding – Sweet Home high school
2016-2018 Mind your microbiome week, Buffalo Public Schools – Sponsored by UB GEM
2011-2017 Faculty Mentor – Association for Women in Mathematics (AWM)
2016 Genome Day 2016 for Buffalo Public Schools – Sponsored by UB GEM
2015 Faculty Mentor – UB LSAMP undergraduate research program for minorities

**Professional Memberships**

2021-present Society of Classification
2019-present American Mathematical Society (AMS)
2012-present American Statistical Association (ASA)
2008-present International Society for Computational Biology (ISCB)
2006-2017 Association for Women in Mathematics (AWM)
2010-2012 American Association for the Advancement of Science (AAAS)

**Development (led) and synergistic teaching activities**

2016-2020 Guest lecture "statistical considerations for the analysis of omics data"
UB Department of Pharmaceutical Sciences
2013-2017 Introduction to Pathway Analysis (annual lecture)
Roswell Park Cancer Institute, graduate program in Molecular Biophysics (BPR 503)
graduate course in Pharmacogenomics in pharmaceutical science (PHC 509)
2015 Introduction to R programming workshop (with Drs. Gaile and Miecznikowski)
UB Computational and Data Enabled Science (CDSE) Days
2014 Bioinformatics guest lecture (STA 525), Department of Biostatistics
2008-2010 Short Course on Systems Genetics (Formerly short course on Complex Traits)
Guest lectures and computer lab development.
The Jackson Laboratory, guest lecture and computer lab development..

**Development (attended) and continuing education and training**

2022 SUNY IITG Large Course project selected participant
2022 SUNY IITG HyFlex project selected participant
2019 UB ICDS, Jupyter and OpenEd workshop
2018 AMIA workshop – introduction to jupyter notebooks for data science

2011-2017 UB Biostatistics, Applied genomics journal club/reading group
2016 International Genetic Epidemiology Society (IGES) Big data phenotyping workshop
University of Toronto, Toronto, Canada.
2016 UB Workshop: Network on enriched academic relationships and mentoring
2016 UB CEI Workshop: How to help students learn (to work) in teams
2012 UB Online Teaching Training Course
2008-2011 Annual Short Course on Systems Genetics,
The Jackson Laboratory, Bar Harbor ME.
2007 High Dimensional Statistics in Biology
Isaac Newton Institute for Mathematical Sciences, Cambridge, UK,
2006 Mathematical Models of the Heart
European Mathematical Society, Svalbard, Norway.
2006 Cardiac Mechanics and Remodeling Workshop
Mathematical Biosciences Institute, Columbus, OH.
2004 Statistical and Numerical Methods for Inverse Problems Workshop
University of Bologna, Italy.
2005 Image Processing Workshop
Mathematical Sciences Research Institute, Berkeley, CA.

## Mentoring

**F32 Mentoring committee**
David Jacobs, Assistant Professor, School of Pharmacy and Pharmaceutical Sciences

**Masters-level students committee chair**
In progress Sarah Metz, MS Bioinformatics and Biostatistics
In progress Yagnavalkya Devarkonda, MS Bioinformatics and Biostatistics
In progress Soren Przygocki, MS Bioinformatics and Biostatistics
2022 Matthew Jehrio, MS Bioinformatics and Biostatistics
2020 Rachael Tylock, MS Bioinformatics and Biostatistics
2018 Shuo Qian, MS Bioinformatics and Biostatistics
2018 Manjit Kaur, MS Bioinformatics and Biostatistics
2018 Sindhuja Sridharan, MS Bioinformatics and Biostatistics
2018 Lina Spokauskaite, MA Biostatistics
2017 Krithika Krishnan, MS Bioinformatics and Biostatistics
2017 Suruchi Jaikumar Ahunja, MS Bioinformatics and Biostatistics
2017 Aishwarya Mandava, MS Bioinformatics and Biostatistics
2017 Rui Cheng, MS Bioinformatics and Biostatistics
2017 Krithika Krishnan, MS Bioinformatics and Biostatistics
2016 Nan Nan, MA Biostatistics
2015 Joselle O'Brien, MA Biostatistics
2015 Janhavi Moharil, MA Biostatistics
2015 Fang Hao, MA Biostatistics
2015 Aaron Crowley, MA Biostatistics
2015 Matthew Miller, MA Biostatistics

**Ph.D. students committee chair**
2022 Tianmou Liu, Computational and Data-Enabled Science and Engineering
2017 Han Yu, Biostatistics

In progress Tiange Shi, Biostatistics
in progress Krithika Krishnan, Computational and Data-Enabled Science and Engineering

in progress Adithya Narayanan, Computational and Data-Enabled Science and Engineering

**Masters-level students committee membership**

2022 Yihao Tan, MA Biostatistics
2021 Michael Richbart, MS Biostatistics and Bioinformatics
2020 Zachary Wintrob, MA Biostatistics
2020 Ki Chen, MPH Biostatistics concentration
2020 Hua-Hsin, MA Biostatistics
2019 Yufei Wu, MA Biostatistics
2019 Chang Xu, MA Biostatistics
2019 Justin Mu, MA Biostatistics
2018 Kaifeng Yu, MA Biostatistics
2017 Jieya Lin, MA Biostatistics
2017 Zeyu Yang, MA Biostatistics
2017 Jiangwang Chen, MA Biostatistics
2016 Emily Schiller, MS Bioinformatics and Biostatistics
2016 Kayla Morrell, MS Bioinformatics and Biostatistics
2016 Sarah Kauss, MA Biostatistics
2015 Michael Edinger, MPH
2015 Mark Heiler, MA Biostatistics
2014 Jie Gong, MA Biostatistics
2013 Darryl George, MA Biostatistics
2013 Chunyuan Diao, MA Biostatistics
2013 Carolyn Horwitz, MPH
2013 Jeffery Rathbun, MA Biostatistics

**Ph.D. students committee membership**

2021 Lorin Miller, Department of Biostatistics
(advisor: Dr. Jeff Miecznikowski)
2020 Zeinab Farhat, Epidemiology and Environmental Health
(advisor: Dr. Lina Mu)
2019 Fan Zhang, Biostatistics
(advisor: Dr. Jeffrey Miecznikowski)
2019 Boris Boutkov, Computational and Data-Enabled Science and Engineering
(advisor: Dr. Paul Bauman)
2019 Vineet Payappalli, Industrial and Systems Engineering
(advisor: Dr. Jun Zhuang)
2018 Michael Vaiana, Computational and Data-Enabled Science and Engineering
(advisor Dr. Sarah Muldoon)
2017 Dr, Laurie Griesenhober, Epidemiology & Environmental Health
(advisor: Dr. Heather Ochs-Balcom)
2015 Dr. Iakovos Toumazis, Industrial & Systems Engineering PhD
(advisor: Dr. Changyun Kwon)
in progress, Renette Jones, Computational and Data-Enabled Science and Engineering
(advisor: Dr. Abani Patra)
in progress Kexin Zhu, Epidemiology and Environmental Health
(advisor: Dr. Lina Mu)

**Summer/Short Term Mentoring**

2018 Eric Kieshel, UB Genetics, Genomics and Bioinformatics Program -4 week lab rotation
2016 Renee Meinhold,RIT undergraduate mentored with Dr. Susan McCann (Roswell Park)
2015 Gabriel Skugor, Department of Mathematics, LSMAP undergraduate summer research
2012 Laurie Griesenhober, formerly in the Department of Mathematics

## Research Support

### Ongoing Research Support

US Army Medical Research 888358/ Ramanathan (PI) 09/2020-08/2022
Project title*: "The metabolomics-neurofilaments-neurodegeneration nexus in multiple sclerosis"*
This project examines the associations between diet, metabolism and neurodegeneration..
Role on Project: Co-I

BrightFocus Foundation M2020227 / Millen (PI) 09/2020-08/2022
Project title*: "Interplay of diet and gut microbiome in age related macular degeneration"*
This project examines the diet and gut microbiome of patients in various stages of AMD.
Role on Project: Co-I

NIH/NIAID R21AI134370 / Ambruster & Ghamen (PI) 06/2020-05/2022
Project title*: Genetic susceptibility to mucosal infections with aging*
This project examines genetics of mucosal infections with aging in collaborative cross mice.
Role on Project: Co-I

NIH/NIMH R01MH118218 / Gainey (PI) 12/2019-05/2024
Project title*: "Emotion regulation in distress disorders: elucidating the role of cognitive processes and person-situation fit in the laboratory and daily life"*
This project examines mood interventions and the impact on daily life and happiness
Role on Project: Co-I

NIH/NIDDK R01 DK123158 / Ambruster (PI) 09/2019-08/2023
Project title*: "Conserved Proteus mirabilis genetic requirements for colonization of the catheterized urinary tract"*
This project examines genetic and clinical factors related to UTIs in mice.
Role on Project: Co-I

NCI: T32 in cancer epidemiology / Freudenheim and Moyish (PIs) 09/2017-08/2022
This grant is collaboration between the University of Buffalo and Roswell Park Cancer Institute for the training of graduate students and postdoctoral fellows using interdisciplinary mentoring and curriculum.
Role on Project: training mentor

### Completed Research Support

NIH/NIGMS R01 GM073646 Blanco (PI) 08/2019-07/2020
Project title: *"Defining the Contribution of Cellular Hypoxia to the Cardiotoxicity of Anticancer Anthracyclines and Trastuzumab"*
This project examines a variety of data related to modeling the pharmacodynamics of anthracycline drugs in down-syndrome and healthy patients.
Role on Project: Co-I

NIH/NIEHS R21 ESO26429/ Mu (PI) 08/2016-07/2020
Project title*: "Metabolomics profiling of biological responses to air pollution"*
This project leverages metabolomics profiling via Mass Spectrometry to assess exposure to air pollution.

Role on Project: Co-I

UB GEM Educational and Engagement Innovation (PI: Hageman Blair) 09/2018-12/2019
Project title: ***"****Introduction to modern genetics through dragon breeding in the high-school classroom****"***
This project supports the design and implementation of an outreach workshop that partners with Sweet Home High School (title 1).
Role on Project: PI

UB: Center of Excellence /Nowak and Surtees (PIs) 06/2015-08/2018
Project title: *The Genome, Environment, and Microbiome.*
This project integrates investigators across disciplines at UB for the purpose of examing the genome, environment, and micobiome, and the complex interplay between them.
Role on Project: Co-I

NIH/NIGMS 2R01GM073646 Blanco (PI) 03/2015-02/2019
Project title: *"Contribution of CBRs and AKRs to the Pharmacodynamics of Anthracycline Drugs"*
This project examines a variety of data related to modeling the pharmacodynamics of anthracycline drugs in down-syndrome and healthy patients.
Role on Project: Co-I

UB CEI Seed Grant (PIs: Hageman Blair & Gaile) 06/2017-12/2018
Project title: ***"****Integrative learning through the data-driven classroom: the DREAM challenge****"***
This project develops an interdisciplinary new course the leverages integrative learning for the ISCB DREAM challenge.
Role on Project: PI

NSF/DMS-1557589 / Hageman Blair (PI) 09/2015- 08/2017
Project title*: "QuBBD: Collaborative Research: Interactive ensemble clustering for mixed data with application to mood disorders"*
This planning grant is a join initiative between NIH and NSF to advance methodologies related to biomedical big data. Related awards for collaborators: DMS-1557642*,* DMS-1557593, DMS-1557576, and DMS-1557668, total amount $100,000.
Role on Project: PI

NSF DMS-1312250/ Hageman Blair (PI) 08/2013-07/2017
Mathematical Biology
Project title: *"Integrated Bayesian deterministic and probabilistic modeling of phenotype-genotype networks in the metabolic system".*
This project examines genotype-phenotype networks and metabolic systems, their integration, with applications to disease phenotypes.
Role on Project: PI

UB: IMPACT funding/ Millen (PI) 06/2015-08/2016
Project title: *"The neonatal microbiome study: a pilot study in Meru County; Kenya"*
This project examines microbiome sample collection method to determine field feasibility. The project was discontinued due to pulled funding on a parent study.
Role on Project: Co-I

UB: IMPACT funding/ Millen (PI) 09/2016-08/2017
Project title: *"Role of the gut microbiome in age-related macular degeneration"*
This project is a pilot study for mail-based stool collection in aging women
Total amount of award: $23,682
Effort: n/a (faculty salary not an allowable cost)
Role on Project: Co-I

UB CTSI/ Hageman Blair, Mieczinkowski, Odunsi, Szyperski (PIs) 11/2015-03/2017
Project title: "*Mulit-class modeling of metabonomics data for the detection of early stage ovarian cance*r"
This project develops predictive models from metabonomics profiles and biomarkers for ovarian cancer. My role was to develop the predictive models.
Total amount of award: $75,000
Effort: n/a (faculty salary not an allowable cost) and partial graduate student support
Role on Project: PI

UB/STOR-1111511/ Hageman Blair and Syzperski (PIs) 05/2014-08/2014
Project title: *"Predictive models to diagnose ovarian cancer"*
This project provided seed money for research development for predictive modeling of ovarian cancer using metabonomics data. The project supported two summer graduate students in Biostatistics to aid in the development the statistical models.
Total amount of award: $35,000
Effort: n/a (faculty salary not an allowable cost)
Role on Project: PI

F32 NIH/NHLBI HL095240/ Hageman (PI) 12/2008-08/2011
Project title*: "Bayesian dynamic genome scale modeling of HDL cholesterol transport"*
This project developed mathematical models to understand HDL metabolism in *mus musculus*.
Total amount of award: $150,000
Effort: 100%
Role on Project: PI