MARY FELLER DAVIS, PH.D., M.S., MLS(ASCP)^{CM}
Associate Professor
Department of Microbiology and Molecular Biology
Brigham Young University
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EDUCATION

Vanderbilt University 2008-2013
Ph.D. in Human Genetics
Advisor: Jonathan L. Haines
Dissertation: Determining the Use of Electronic Medical Records in Genetic Studies of Multiple Sclerosis
M.S. in Applied Statistics
Thesis: Parkinson Disease Loci in the mid-Western Amish
Brigham Young University 2004-2008
B.S. in Clinical Laboratory Science

PROFESSIONAL EXPERIENCE

Associate Professor, Brigham Young University 2014-present
Department of Microbiology and Molecular Biology
Adjoint Assistant Professor, Vanderbilt University 2019-present
Department of Biomedical Informatics
COVID-19 Technical Supervisor, Brigham Young University 2021-present
Student Health Center

INVITED SEMINARS

COVID-19 testing at BYU: A molecular solution. Brigham Young University. Provo, UT. January 27, 2022.

Pharmacogenomics of Multiple Sclerosis in an EHR Dataset. University of Colorado Anschutz Medical Campus. Aurora, CO. October 7, 2020.

Practical Guide to Cancer Diagnosis and Treatment Coding in Cancer Risk and Treatment Outcome Studies Using Administrative Claims and EHRs. International Conference of Pharmacoepidemiology. Philadelphia, PA. August 24, 2019.

Genetic Associations to Microphenotypes in Electronic Health Records: Identifying Causes of Multiple Sclerosis Progression. University of Utah Department of Biomedical Informatics Invited Seminar. Salt Lake City, UT. March 2, 2016.

Microphenotypes in Electronic Health Records: Mining the Way for Personalized Medicine. BYU Department of Plant and Wildlife Science Seminar. Provo, UT. October 22, 2015.

Extraction and analysis of clinical traits of multiple sclerosis using electronic medical records. American Society for Human Genetics Annual Meeting. October 23, 2013.

Genetic analysis of MS using EMR and BioVU—A template for clinical research. Vanderbilt Neurology Grand Rounds. October 4, 2013.

Family-specific linkage analysis of multiple sclerosis. Vanderbilt University Graduate Student Research Symposium. March 26, 2010.

PUBLICATIONS

E. Misicka, **M.F. Davis**, W. Kim, S.W. Brugger, J.T. Beales, S. Loomis, P.G. Bronson, F.B.S. Briggs. "A higher burden of multiple sclerosis genetic risk confers an earlier onset." *Multiple Sclerosis Journal*. Oct. 2021.

E. Nysetvold, T. Mika, W. Elison, D. Garrett, J. Hunt, I. Tsuchiya, S.W. Brugger, **M.F. Davis**, S.H. Payne. E.G. Bailey. "Infant Vaccination Does Not Predict Increased Infant Mortality Rate: Correcting Past Misinformation." medRxiv. Oct. 2021. In review at *PLoS ONE*.

J.M. Miller J.T. Beales, M.D. Montierth, F.B. Briggs, S.F. Frodsham, **M.F. Davis**. "The Impact of Multiple Sclerosis Disease Status and Subtype on Hematological Profile." *Int J Environ Res Public Health*. Mar 2021.

F. M. Wang, **M.F. Davis**, F.B. Briggs. "Predicting self-reported depression after the onset of multiple sclerosis using genetic and non-genetic factors." *Multiple Sclerosis*. 2021.

D. K. Johnson, K. M. Reynolds, M. D. Montierth, V. M. Todd, A. Barnado, B. D. Poole, **M. F. Davis**. "Contribution of viral infection to risk for cancer in systemic lupus erythematosus and multiple sclerosis." *PLOS One.* Jan 2021.

S. W. Brugger, M. C. Gardner, J. T. Beales, F. B. Briggs, **M. F. Davis**. "Depression in multiple sclerosis patients associated with risk variant near NEGR1." *Multiple Sclerosis and Related Disorders*. Sept. 2020.

International Multiple Sclerosis Genetics Consortium. "Multiple sclerosis genomic map implicates peripheral immune cells and microglia in susceptibility." *Science*. Sept. 2019.

F. B. Briggs, J. C. Yu, **M. F. Davis**, J. Jiangyang, S. Fu, E. Parrotta, D. D. Gunzler, D. Ontaneda. "Multiple sclerosis risk factors contribute to onset heterogeneity." *Multiple Sclerosis and Related Disorders*. Feb. 2019.

International Multiple Sclerosis Genetics Consortium. "Low-Frequency and Rare-Coding Variation Contributes to Multiple Sclerosis Risk. *Cell*. Nov. 2018.

K. Kowalec…**M.F. Davis**, C.J. Ross, H. Tremlett, B.C. Carleton. "Common variation near IRF6 is associated with IFN-beta-induced liver injury in multiple sclerosis." *Nature Genetics*. Aug. 2018.

R. Barr, **M. F. Davis**. "Reproducing Clinically Significant Multi-organism Cultures to Improve Clinical Microbiology Education and Practice." *Journal of Microbiology and Biology Education*. Feb. 2018.

K. B. Pallister, S. Mason, T. K. Nygaard, B. Liu, S. Griffith, J. Jones, S. Linderman, M. Hughes, D. Erickson, J. M. Voyich, **M. F. Davis**, E. Wilson. "Bovine CCL28 Mediates Chemotaxis via CCR10 and Demonstrates Direct Antimicrobial Activity against Mastitis Causing Bacteria." *PLoS One*. Sep. 2015.

M. F. Davis, J. L. Haines. "The intelligent use and clinical benefits of electronic medical records in multiple sclerosis." *Expert Rev Clin Immunol*. Feb. 2015.

M. F. Davis, S. Sriram, W. S. Bush, J. C. Denny, and J. L. Haines. "Automated extraction of clinical traits of multiple sclerosis in electronic medical records." *JAMIA*. Dec. 2013.

M. F. Davis, A. C. Cummings, L. N. D'Aoust, L. Jiang, D. R. Velez Edwards, R. Laux, L. Reinhart-Mercer, D. Fuzzell, W. K. Scott, M. A. Pericak-Vance, S. L. Lee, and J. L. Haines, "Parkinson disease loci in the mid-western Amish," *Hum. Genet.* Nov. 2013.

A. H. Beecham, N. A. Patsopoulos, D. K. Xifara, **M. F. Davis**, A. Kemppinen, C. Cotsapas, T. S. Shah, C. Spencer, D. Booth, A. Goris, A. Oturai, J. Saarela, B. Fontaine, B. Hemmer, C. Martin, F. Zipp, S. D'Alfonso, F. Martinelli-Boneschi, B. Taylor, H. F. Harbo, I. Kockum, J. Hillert, T. Olsson, M. Ban, J. R. Oksenberg, R. Hintzen, L. F. Barcellos, C. Agliardi, L. Alfredsson, M. Alizadeh, C. Anderson, R. Andrews, H. B. Sondergaard, A. Baker, G. Band, S. E. Baranzini, N. Barizzone, J. Barrett, C. Bellenguez, L. Bergamaschi, L. Bernardinelli, A. Berthele, V. Biberacher, T. M. Binder, H. Blackburn, I. L. Bomfim, P. Brambilla, S. Broadley, B. Brochet, L. Brundin, D. Buck, H. Butzkueven, S. J. Caillier, W. Camu, W. Carpentier, P. Cavalla, E. G. Celius, I. Coman, G. Comi, L. Corrado, L. Cosemans, I. Cournu-Rebeix, B. A. Cree, D. Cusi, V. Damotte, G. Defer, S. R. Delgado, P. Deloukas, S. A. di, A. T. Dilthey, P. Donnelly, B. Dubois, M. Duddy, S. Edkins, I. Elovaara, F. Esposito, N. Evangelou, B. Fiddes, J. Field, A. Franke, C. Freeman, I. Y. Frohlich, D. Galimberti, C. Gieger, P. A. Gourraud, C. Graetz, A. Graham, V. Grummel, C. Guaschino, A. Hadjixenofontos, H. Hakonarson, C. Halfpenny, G. Hall, P. Hall, A. Hamsten, J. Harley, T. Harrower, C. Hawkins, G. Hellenthal, C. Hillier, J. Hobart, M. Hoshi, S. E. Hunt, M. Jagodic, I. Jelcic, A. Jochim, B. Kendall, A. Kermode, T. Kilpatrick, K. Koivisto, I. Konidari, T. Korn, H. Kronsbein, C. Langford, M. Larsson, M. Lathrop, C. Lebrun-Frenay, J. Lechner-Scott, M. H. Lee, M. A. Leone, V. Leppa, G. Liberatore, B. A. Lie, C. M. Lill, M. Linden, J. Link, F. Luessi, J. Lycke, F. Macciardi, S. Mannisto, C. P. Manrique, R. Martin, V. Martinelli, D. Mason, G. Mazibrada, C. McCabe, I. L. Mero, J. Mescheriakova, L. Moutsianas, K. M. Myhr, G. Nagels, R. Nicholas, P. Nilsson, F. Piehl, M. Pirinen, S. E. Price, H. Quach, M. Reunanen, W. Robberecht, N. P. Robertson, M. Rodegher, D. Rog, M. Salvetti, N. C. Schnetz-Boutaud, F. Sellebjerg, R. C. Selter, C. Schaefer, S. Shaunak, L. Shen, S. Shields, V. Siffrin, M. Slee, P. S. Sorensen, M. Sorosina, M. Sospedra, A. Spurkland, A. Strange, E. Sundqvist, V. Thijs, J. Thorpe, A. Ticca, P. Tienari, D. C. van, E. M. Visser, S. Vucic, H. Westerlind, J. S. Wiley, A. Wilkins, J. F. Wilson, J. Winkelmann, J. Zajicek, E. Zindler, J. L. Haines, M. A. Pericak-Vance, A. J. Ivinson, G. Stewart, D. Hafler, S. L. Hauser, A. Compston, G. McVean, J. P. De, S. J. Sawcer, and J. L. McCauley, "Analysis of immune-related loci identifies 48 new susceptibility variants for multiple sclerosis," *Nat. Genet.*, Nov. 2013.

A. C. Cummings, E. Torstenson, **M. F. Davis**, L. N. D'Aoust, W. K. Scott, M. A. Pericak-Vance, W. S. Bush, and J. L. Haines, "Evaluating power and type 1 error in large pedigree analyses of binary traits," *PLoS. One.* May 2013.

PRESENTATIONS AT LOCAL, REGIONAL, AND NATIONAL MEETINGS

*undergraduate student, ^graduate student

S.W. Brugger^, M. Grose*, J. Grose, M.F. Davis. "Codon bias analysis of wildtype SARS-CoV-2 and prevalent variants indicates a mutational trajectory independent of human pulmonary tissue and genomic bias." Annual Meeting of the American Society of Human Genetics. Virtual. October 2021.

A. Hernandez*, F.B.B. Briggs, M.F. Davis. "Assessing the difference in multiple sclerosis age of onset amongst different racial populations through the use of electronic health records." Annual Meeting of the American Society of Human Genetics. Virtual. October 2021.

J. T. Beales*, M. R. Rimmasch*, K. M. Reynolds*, **M. F. Davis**. "Automated extraction of multiple sclerosis treatment timelines: preparing free-text electronic health record data for use in pharmacogenomics analyses." 8th Joint ACTRIMS-ECTRIMS Meeting. Virtual. September 2020.

K. M. Reynolds*, J. T. Beales*, M. Rimmasch*, J. C. Denny, **M. F. Davis.** "Pharmacogenetic analysis of rs2205986 associated with glatiramer acetate-induced liver injury in multiple sclerosis patients." Annual Meeting of the American Society of Human Genetics. Houston, TX. October 2019.

S. W. Brugger*, X. Niu, J. C. Denny, **M. F. Davis**. "Pharmacogenetic analysis of known variant associated with IFN-β-induced liver injury replicated in African Americans with multiple sclerosis." Annual Meeting of the American Society of Human Genetics. Houston, TX. October 2019.

M. Rimmasch*, J. T. Beales*, J. C. Denny, **M. F. Davis**. "Automating the extraction of Multiple Sclerosis treatment data for future pharmacogenetic studies." Americans Committee for Treatment and Research in Multiple Sclerosis Forum. Dallas, TX. February 2019.

M. F. Davis, M. D. Montierth*, J. C. Denny. "The Role of Uric Acid in Multiple Sclerosis Risk." Americans Committee for Treatment and Research in Multiple Sclerosis Forum. Dallas, TX. February 2019.

GRANT FUNDING

BYU Emmeline B. Wells 2022
Principal Investigator $25,000
Multiple sclerosis effects postpartum and in minorities

BYU Gerontology 2020-2021
Co-Investigator $10,000
Identification and Characterization of PAS Kinase Alleles Associated with Diabetes and Neurodegenerative Disease

National Multiple Sclerosis Society 2017-2018
Co-Investigator $60,000

Quantifying the genetic burden of multiple sclerosis age of onset

BYU College of Life Sciences Teaching Enhancement Grant 2016
Principal Investigator $9,600
iPads for MLS students to document skills and learning experiences

BYU College of Life Sciences Teaching Enhancement Grant 2015
Principal Investigator $9,300
MMBio 407: 12 iPad minis to take pictures of plates and biochemical tubes and funds to develop a mixed cultures protocol

National Institutes of Health Pre-doctoral Training Grant Fellow T32 2009-2011

COURSES TAUGHT

MMBio 102 Introduction to Medical Laboratory Science	2019-present
MMBio 411 Molecular Diagnostics	2018-present
MMBio 407 Clinical Microbiology	2015-present
MMBio 422 Clinical Chemistry	2014-2016
MMBio 423 Clinical Chemistry and Molecular Diagnostics	2014-2015
MMBio 424 Clinical Chemistry Laboratory Techniques	2014-2016
MMBIo 425 Clinical Chemistry and Molecular Diagnostics Laboratory Techniques	2014-2015
MMBio 494R/694R Mentored Research	2014-present
MMBio 496R Clinical Experience	2014-present

INVITED LECTURES

PWS 188 Introduction to Genetics, Genomics, and Biotechnology	2015-2019
Bio 465 Bioinformatics	2016
MMBio 661	2015, 2016
LS 101 Life Sciences 101	2016, 2019
WS 370 Women in Science	2015, 2019
MMBio 422 Clinical Chemistry	2014

UNDERGRADUATE STUDENTS MENTORED

1. Emili Hartwell
2. Ryan Colby
3. Isaiah Grayam
4. Madelyn Grose
5. Caitlin Silva
6. Spencer Yeates
7. Kristin Durrant
8. Tyler Daley
9. Rebecca Koch
10. Joel Masopeh
11. Amy Hernandez
12. Matthew Porter
13. Kristen Watabe
14. Sumin Hwang
15. Kaylia Reynolds
16. Braden Eberhard
17. Renee Koth
18. Jacob Miller
19. Megan Rimmasch
20. Steven Brugger
21. Jeremy Beales
22. Caisa Blau
23. Mekeli Nelson
24. Jesse Norris
25. Joshua Adams
26. Celeste Dunn
27. Matthew Montierth
28. Shayla Draper
29. Benjamin Rowland
30. Megan Soelberg
31. Holly Jensen
32. Dylan Rowe
33. Alex Gosch

34. Cannon Gardner
35. Rebecca Barr
36. Scott Frodsham
37. Mackenzie Olsen
38. Virginia Rodriguez
39. Spencer Sutton
40. Benjamin Peaden
41. Matt Durrant
42. Tielle Gallion
43. Derek Nielsen

GRADUATE STUDENTS MENTORED

Mekeli Sneddon (Ph.D.) 2021
S. William Brugger (M.S.) 2021-current
Marcus Stucki (M.S.) 2015-2016

GRADUATE STUDENT COMMITTEES

Daniel Arens (Ph.D. – Grose lab)	2017-present
John Carter (Ph.D. – Johnson lab)	2016-present
Alex Erikson (M.S. – Griffitts lab)	2016-2018
Jeralyn Franson (M.S. – Bridgewater lab)	2015-2019
Ann-Aubrey Reid (M.S. – Robison lab)	2014-2019

HONORS AND AWARDS

Alcuin Fellowship	2021-2024
ASMCUE Early-Career Faculty Travel Award	2015
College of Life Sciences Teaching Enhancement Grant	2014, 2015
Vanderbilt Graduate School Travel Grant	2013
Magna Cum Laude, Brigham Young University	2008
Dade Behring-Emil von Behring Scholarship	2008
ASCP National Student Honor Award	2007
Garth L. Lee Teaching Assistant Award	2006, 2007
Brigham Young University Biology Dean's Honor Roll	2004-2006
Brigham Young University Heritage Scholarship *Full tuition, four years*	2004-2008
Brigham Young University Summer Scholarships	2005, 2007
Wal-Mart Scholarship	2004
ELKS Lodge Utah State Scholarship	2004

MEMBERSHIPS

American Society of Clinical Pathology	2015-present
American Society for Clinical Laboratory Science	2013-present
American Society of Human Genetics	2009-present

CITIZENSHIP/SERVICE

AMIA 2021 Informatics Summit Abstract Reviewer	2021
ASHG 2020 Annual Meeting Abstract Reviewer	2020
BYU Healthcare Industry Initiative Committee	2020-present

BYU Healthcare Industry Network Conference Committee	2019
ASCLS Region IX Educators' Network Symposium Organizer	2018, 2019
ASCLS Region IX Educators' Network Coordinator	2018-present
Medical Laboratory Science Scholarship Committee	2017-present
MMBio Department Faculty Search Committee	2015-2016
Journal of Biochemical and Molecular Toxicology Editorial Review Board	2015-2018
College of Life Sciences MEG Review Panel	2014-2016
Medical Laboratory Sciences Program	2014-present
MMBio Department Undergraduate Curriculum Committee	2014-present
EvoBio Conference Program Committee Member	2014