

Curriculum Vitae

Name: Jennifer Jean Trowbridge, PhD

Office Address: The Jackson Laboratory
600 Main Street, Bar Harbor, ME 04609

Education:

1998-2002 B.Sc. The University of Western Ontario (Genetics)
2002-2006 Ph.D. The University of Western Ontario (Microbiology and Immunology)

Postdoctoral Training:

2006-2012 Postdoctoral Fellow (Hematology/Oncology) Dana-Farber Cancer Institute and Children's Hospital Boston

Positions and Academic Appointments:

2011-2012 Instructor in Pediatrics, Harvard Medical School
2012-2018 Assistant Professor, The Jackson Laboratory
2012-present Adjunct Faculty, University of Maine
2012-present Adjunct Faculty, Tufts University School of Medicine
2018-present Associate Professor, The Jackson Laboratory
2020-2021 Co-Program Leader, NCI-Designated Basic Cancer Center, The Jackson Laboratory
2021-present Chair, Scientific Advisory Committee (faculty senate), The Jackson Laboratory

Awards and Honors:

2005-2007 National Cancer Institute of Canada Research Studentship
2006-2007 Poland Award (University of Western Ontario)
2007 Canadian Institutes of Health Research Postdoctoral Fellowship (declined)
2007-2010 Leukemia & Lymphoma Society Postdoctoral Fellowship
2011-2013 American Society of Hematology Scholar Award
2013-2017 The Ellison Medical Foundation New Scholar in Aging
2016-2018 The V Foundation for Cancer Research V Scholar Award
2020 International Society for Experimental Hematology (ISEH) Janet Rowley Award
2020-2025 Leukemia & Lymphoma Society Scholar Award
2021 Invited Introducer of Plenary Scientific Session, ASH Annual Meeting

Professional Memberships & External Committee Service:

2007-present Member, American Society of Hematology (ASH)
2014-present Member, American Association for Cancer Research (AACR)
2015 NIH Study Section- Molecular & Cellular Hematology, ad-hoc
2015-2016 Study Section, ASH Scholar Award
2017-present Member, International Society for Experimental Hematology (ISEH)
2019-2020 Member, ASH Awards Review Subcommittee

2020 NIH Study Section- Cancer and Molecular Pathogenesis, ad-hoc
2020-2022 Scientific Program Committee, ISEH Annual Meeting
2020-2022 Discovery Research Grant Review Panel, Edward P. Evans Foundation
2020-2025 Member, ASH Scientific Committee on Epigenetics and Genomics
2021 Vice-chair, ASH Scientific Committee on Epigenetics and Genomics
2021-2023 Director (elected), ISEH Board of Directors
2022 Chair, ASH Scientific Committee on Epigenetics and Genomics
2022 Career Development Program Review Panel, Leukemia & Lymphoma Society

External Research Support (Current):

1 R01 DK118072-01, NIH/NIDDK 07/01/18-06/30/23

Trowbridge (PI)

Developing Effective Approaches to Extend Hematopoietic Healthspan by Targeting Cell-Extrinsic and Cell-Intrinsic Alterations at Middle Age

1 R01 AG069010-01A1, NIH/NIA 07/01/20-06/30/25

Trowbridge (PI)

Discovery of Aging-Associated Mechanisms Causing Expansion and Progression of Clonal Hematopoiesis of Indeterminant Potential (CHIP)

1 U01 AG077925-01, NIH/NIA 09/15/21-06/30/26

Trowbridge (PI), Levine (co-PI)

Assessing the Interplay Between Inflammatory Signaling and Epigenetic Dysregulation in Age-Associated Clonal Hematopoiesis and Leukemia Initiation

Leukemia & Lymphoma Society Scholar Award 07/01/20-06/30/25

Trowbridge (PI)

Discovery of Aging-Driven Mechanisms Causing Clonal Hematopoiesis (CH) and its Progression to Hematological Malignancy

EvansMDS Foundation Discovery Research Grant 09/01/20-08/31/23

Trowbridge (PI)

Discovery of Mechanisms by Which the Aging Bone Marrow Microenvironment Drives Progression of Clonal Hematopoiesis to MDS

H3 Biomedicine Sponsored Research Agreement 02/02/21-08/02/22

Trowbridge (PI)

Epigenetic Regulation of Clonal Hematopoiesis

External Research Support (Completed, past 5 years):

EvansMDS Foundation Discovery Research Grant 09/01/18-08/31/20

Trowbridge (PI)

Discovery of Mechanisms Driving Evolution of Clonal Hematopoiesis to Bone Marrow Failure from Dnmt3a-Mutant Stem Cells

V2016-005 JJT-01, V Foundation for Cancer Research 11/01/16-10/31/18
Trowbridge (PI)

Modeling Epigenome Evolution from Dnmt3A Mutation to the Development of Acute Myeloid Leukemia (AML)

5 R21 CA184851-01, National Cancer Institute (NCI) 05/05/14-04/30/16
Trowbridge (PI)

(PQB5) Epigenetic Drivers of Hematopoietic Stem Cell Transformation

Publication List:

Original Articles

Shojaei F, **Trowbridge J**, Gallacher L, Yuefei L, Goodale D, Karanu F, Levac K, Bhatia M. Hierarchical and ontogenic position serve to define the molecular basis of human hematopoietic stem cell behavior. Developmental Cell 2005; **8**: 651-663.

Rosu-Myles M, Stewart E, **Trowbridge J**, Ito CY, Zandstra P, Bhatia M. A unique population of bone marrow cells migrates to skeletal muscle via hepatocyte growth factor/c-Met axis. Journal of Cell Science 2005; **118**: 4343-4352.

Trowbridge JJ, Xenocostas A, Moon RT, Bhatia M. Glycogen synthase kinase-3 is an in vivo regulator of hematopoietic stem cell repopulation. Nature Medicine 2006; **12**: 89-98.

Trowbridge JJ, Scott MP, Bhatia M. Hedgehog modulates cell cycle regulators in stem cells to control hematopoietic regeneration. Proc. Natl. Acad. Sci. 2006; **103**: 14134-14139.

Trowbridge JJ, Snow JW, Kim J, Orkin SH. DNA methyltransferase 1 is essential for and uniquely regulates hematopoietic stem and progenitor cells. Cell Stem Cell 2009; **5**: 442-449.

Trowbridge JJ, Guezguez B, Moon RT, Bhatia M. Wnt3a activates dormant c-kit- bone marrow derived cells with short-term multilineage hematopoietic reconstitution capacity. Stem Cells 2010; **28**: 1379-1389.

Snow JW, **Trowbridge JJ**, Fujiwara T, Emambokus NE, Grass JA, Orkin SH, Bresnick EH. A single cis element maintains repression of the key developmental regulator Gata2. PLoS Genetics 2010; **6**: e1001103.

Snow JW, **Trowbridge JJ**, Johnson KD, Fujiwara T, Emambokus N, Grass JA, Orkin S, Bresnick EH. Context-dependent function of “GATA switch” sites in vivo. Blood 2011; **117**: 4769-4772.

Trowbridge JJ, Sinha AU, Li M, Armstrong SA, Orkin SH. Haploinsufficiency of Dnmt1 impairs leukemia stem cell function through derepression of bivalent chromatin domains. Genes & Development 2012; **26**: 344-349.

Bai X*, **Trowbridge JJ***, Riley E, Lee J, DiBiase A, Kaartinen V, Orkin SH, Zon LI. TIF1-gamma plays an essential role in murine hematopoiesis and regulates transcriptional elongation of erythroid genes. Developmental Biology 2013; **373**: 422-430. *Equal contribution

Xu J, Bauer DE, Kerényi MA, Vo TD, Hou S, Hsu Y-J, Yao H, **Trowbridge JJ**, Mandel G, Orkin SH. Corepressor-dependent silencing of fetal hemoglobin expression by BCL11A. Proc. Natl. Acad. Sci., 2013; **110**: 6518-6523.

George J, Uyar A, Young K, Kuffler L, Waldron-Francis K, Marquez E, Ucar D, **Trowbridge JJ**. Leukaemia cell-of-origin identified by chromatin landscape of bulk tumour cells. Nature Communications 2016; **7**: 12166. doi: 10.1038/ncomms12166.

Burberry A, Suzuki N, Wang J, Moccia R, Mordes DA, Stewart MH, Suzuki-Uematsu S, Ghosh S, Singh A, Merkle FT, Koszka K, Li Q, Zon L, Rossi DJ, **Trowbridge JJ**, Notarangelo LD, Eggen K. Loss-of-function mutations in the C9ORF72 mouse ortholog cause fatal autoimmune disease. Science Translational Medicine 2016; **8**: 347ra93. doi: 10.1126/scitranslmed.aaf6038.

Young K, Borikar S, Bell R, Kuffler L, Philip V, **Trowbridge JJ**. Progressive alterations in multipotent hematopoietic progenitors underlie lymphoid cell loss in aging. The Journal of Experimental Medicine 2016; **213**: 2259-2267.

Hsu JH, Hubbell-Engler B, Adelmant G, Huang J, Joyce CE, Vazquez F, Weir BA, Montgomery P, Tsherniak A, Giacomelli AO, Perry JA, **Trowbridge J**, Fujiwara Y, Cowley GS, Xie H, Kim W, Novina CD, Hahn WC, Marto JA, Orkin SH. Prmt1-mediated translation regulation is a crucial vulnerability of cancer. Cancer Research 2017; **77**: 4613-4625.

Loberg MA, Bell RK, Goodwin LO, Eudy E, Miles LA, SanMiguel JM, Young K, Bergstrom DE, Levine RL, Schneider RK, **Trowbridge JJ**. Sequentially induced mouse models reveal that Npm1 mutation causes malignant transformation of Dnmt3a-mutant clonal hematopoiesis. Leukemia 2019; **33**: 1635-1649.

Khokhar ES, Borikar S, Eudy E, Stearns T, Young K, **Trowbridge JJ**. Aging-associated decrease in the histone acetyltransferase KAT6B causes myeloid-biased hematopoietic stem cell differentiation. Experimental Hematology 2020; **82**: 43-52.

Young K, Loberg MA, Eudy E, Schwartz LS, Mujica KD, **Trowbridge JJ**. Heritable genetic background alters survival and phenotype of Mll-AF9-induced leukemias. Experimental Hematology 2020; **89**: 61-67.

Young K, Eudy E, Bell R, Loberg MA, Stearns T, Sharma D, Velten L, Haas S, Filippi MD, **Trowbridge JJ**. Decline in IGF1 in the bone marrow microenvironment initiates hematopoietic stem cell aging. Cell Stem Cell 2021; **28**: 1473-1482.

Wu HC, Rerolle D, Berthier C, Hleihel R, Sakamoto T, Quentin S, Benhenda S, Morganti C, Wu C, Conte L, Rimsky S, Sebert M, Clappier E, Souquere S, Gachet S, Soulier J, Durand S, **Trowbridge JJ**, Benit P, Rustin P, El Hajj H, Raffoux E, Ades L, Itzykson R, Dombret H,

Fenaux P, Espeli O, Kroemer G, Brunetti L, Mak TW, Lallemand-Breitenbach V, Bazarbachi A, Falini B, Ito K, Martelli MP, de The H. Cancer Discovery 2021; in press, online 10.1158/2159-8290.CD-21-0177.

Reviews, Chapters and Editorials

Trowbridge JJ, Moon RT, Bhatia M. Hematopoietic stem cell biology: Too much of a Wnt thing. Nature Immunology 2006; **7**:1021-1023.

Wang J, **Trowbridge JJ**, Rao S, Orkin SH. Proteomic studies of stem cells. In D. Melton, & L. Girard (Eds.), StemBook (Internet). 2008 Cambridge, MA: Harvard Stem Cell Institute.

Trowbridge JJ, Orkin SH. DNA methylation in adult stem cells: new insights into self-renewal. Epigenetics 2010; **5**: 189-193.

Trowbridge JJ. Hematopoietic stem cells. In S. Li, N. L'Heureux, & J. Elisseff (Eds.), Stem Cell and Tissue Engineering (pp.31-48). 2011 Singapore: World Scientific Publishing.

Trowbridge JJ, Orkin SH. Dnmt3a silences hematopoietic stem cell self-renewal. Nature Genetics 2011; **44**: 13-14.

Challen GA, **Trowbridge JJ**. Role of DNA methyltransferases and DNA methylation in cell fate decisions during blood cell development and leukemia. In C. Bonifer & P. Cockerill (Eds.), Transcriptional and Epigenetic Mechanisms Regulating Normal and Aberrant Blood Cell Development. 2014 Springer Publishing.

Young K, **Trowbridge JJ**. Open chromatin profiling as a novel strategy for identifying cancer cell-of-origin. Molecular & Cellular Oncology 2016; **3**:e1236770.
doi:10.1080/23723556.2016.1236770.

Borikar S, **Trowbridge JJ**. The Mediator of hematopoietic stem cell homeostasis. Cell Stem Cell 2016; **19**: 677-678.

Trowbridge JJ. Context-specific tumor suppression by PHF6. Blood 2019; **133**: 1698-1700.

Marquez EJ, **Trowbridge J**, Kuchel GA, Banchereau J, Ucar D. The lethal sex gap: COVID-19. Immune Aging 2020; **17**: 13.

SanMiguel JM, Young K, **Trowbridge JJ**. Hand in Hand: Intrinsic and extrinsic drivers of aging and clonal hematopoiesis. Experimental Hematology 2020, **91**:1-9.

Trowbridge JJ, Starczynowski DT. Innate immune pathways and inflammation in hematopoietic aging, clonal hematopoiesis, and MDS. Journal of Experimental Medicine 2021, **218**:e20201544.

Patents:

Moon RT, Bhatia M, **Trowbridge JJ**, inventors; Methods for regulation of stem cells. US Patent 11/026399

Invited Lectures (past 5 years):

2017:

- 46th Annual Meeting, International Society for Experimental Hematology, Frankfurt, Germany
- 26th Annual Short Course on Experimental Models of Human Cancer, JAX
- 21st Century Mouse Genetics, JAX

2018:

- Development & Pathogenesis of Disease Seminar Series, The University of Kansas Medical Center, Kansas City, KS
- 27th Annual Short Course on Experimental Models of Human Cancer, JAX
- Department of Immunology Seminar Series, Tufts University School of Medicine, Boston, MA
- Weatherall Institute for Molecular Medicine Seminar Series, University of Oxford, UK
- Mount Desert Island Biological Laboratory Seminar Series, Bar Harbor, ME
- 21st Century Mouse Genetics Course, JAX
- Grand Rounds, University of Colorado Cancer Center, Denver, CO

2019:

- Hematology Department Seminar Series, University of Washington, St. Louis, MO
- 28th Annual Short Course on Experimental Models of Human Cancer, JAX
- University of Florida Health Cancer Center Seminar Series, Gainesville, FL
- Tisch Cancer Institute Seminar Series, Mount Sinai, NY
- Ohio State University Cancer Center Leukemia Research Seminar Series, Columbus, OH
- Forbeck Forum ‘Leukemia stem cells, heterogeneity, & metabolism – new directions for AML therapy’, Denver, CO
- RegenAge Symposium “Defining the Interface Between Regeneration & Aging”, MDIBL, Bar Harbor, ME
- Colby Cancer Consortium Lecture Series, Colby College, Waterville, ME
- ASH Annual Meeting Scientific Program ‘Molecular Mechanisms of Bone Marrow Failure’, Orlando, FL
- Joint NIA/NCI Workshop ‘Transformation and Aging of Stem Cells’, Bethesda, MD

2020:

- Department of Toxicology & Cancer Biology Seminar Series, University of Kentucky, Lexington, KY
- Janet Rowley Award Lecture, Annual Meeting of the International Society for Experimental Hematology (virtual)
- European Hematology Association (EHA) Molecular Hemopoiesis Workshop (virtual)
- EvansMDS Foundation Summit 2020 (virtual)
- ASH Annual Meeting Friday Scientific Workshop, Aging and Hematology (virtual)
- 29th Annual Short Course on Experimental Models of Human Cancer, JAX (virtual)

2021:

- Keynote: Edward P. Evans Seminar in MDS; DFCI Hematologic Malignancies &

Bone Marrow Transplant Grand Rounds (virtual)

- Keystone Symposia on Hematopoiesis (virtual); speaker and session chair
- Center for Epigenetics Seminar Series, Van Andel Institute (virtual)
- Hematology Research Seminar Series, St. Jude Children’s Research Hospital (virtual)
- Children’s Research Institute Seminar Series (selected by trainees), UT Southwestern (virtual)
- Division of Hematology/Oncology Seminar Series, Boston Children’s Hospital (virtual)
- 30th Annual Short Course on Experimental Models of Human Cancer, JAX (virtual)
- Sanford Stem Cell Symposium, UC San Diego (virtual)
- 2021 AACR Virtual Meeting: Clonal Hematopoiesis (virtual)

2022:

- Memorial Sloan Kettering Center for Hematologic Malignancies Seminar Series (virtual)
- Joint NCI/NHBLI Workshop on Myelodysplastic Syndrome (virtual)
- Myeloid Working Group Seminar Series, Vanderbilt University School of Medicine (virtual)
- Immunology Seminar Series (graduate student-led), Stanford University
- Pathology Seminar Series, NYU Langone Health (virtual)
- 13th International Workshop on Molecular Aspects of Myeloid Stem Cell Development

Trainees:

Postdoctoral (3):

| | | |
|--------------|--------------------|---|
| 2021-current | Jayna Mistry | JAX Scholar Award (2022-2024) |
| 2018-current | Jennifer SanMiguel | ASH Scholar Award (2022-2024) NIH T32-HD007065 (2018-2020) NIH T32 PGAD (2020-2021) |
| 2014-2020 | Kira Young | JAX Pyewacket Fund (2014-2016) NIH T32-HD007065 (2015-2017) ASH Scholar Award (2018-2020) current: Associate Research Scientist, JAX |

PhD students (3):

| | | |
|--------------|----------------|--|
| 2019-current | Logan Schwartz | Tufts University NIH F31-DK127573 (2020-2023) |
| 2015-2019 | Eraj Khokhar | University of Maine GSBSE; current: Postdoctoral Fellow, UMass Worchester |
| 2013-2017 | Sneha Borikar | Tufts University; current: Principal Scientist I, Novartis |

JAX summer student program (6):

| | | |
|------|----------------------------|--|
| 2021 | Brandon James | current: undergraduate, Delaware Valley University |
| 2019 | Maximo Kesselhaut | current: undergraduate, Yale |
| 2017 | Teniola Idowu | current: PhD candidate, NYU |
| 2016 | Zollie Yavarow | current: PhD candidate, Duke |
| 2015 | Matthew Loberg | current: MD/PhD candidate, Vanderbilt |
| 2013 | Jennifer Ditano Hinds, PhD | current: Senior Scientist I, AbbVie |

Thesis Advisory Committees (7):

| | | |
|--------------|---------------------|------------------------------------|
| 2019-current | Monique Mills | University of Maine GSBSE |
| 2016-2021 | Kate Foley | Tufts University |
| 2020-2021 | Teresa Easterbrooks | University of Maine GSBSE |
| 2019-2020 | Ashleigh Beaulieu | University of Maine GSBSE |
| 2015-2019 | Alexander Fine | Tufts University (committee chair) |
| 2016-2019 | Qiming Wang | Tufts University |
| 2016-2017 | Nicholas Cutter | University of Maine GSBSE |