Curriculum Vitae – Brian Christopher Miller

CONTACT
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PRESENT POSITION

Instructor in Medicine, Harvard Medical School, Dana Farber Cancer Institute
Post-Doctoral Researcher in the lab of Dr. Arlene H. Sharpe

POST-GRADUATE TRAINING

2014-2018 Fellowship in Hematology/Oncology, Dana Farber Cancer Institute/MGH Cancer Center

2012-2014 Residency in Internal Medicine, Duke University Hospital

2011-2012 Internship in Internal Medicine, Duke University Hospital

EDUCATION

2003-2011 **Washington University School of Medicine**, St. Louis, MO
MD/PhD, PhD in immunology, Alpha Omega Alpha Member

1999-2003 **Princeton University,** Princeton, NJ
Bachelor of Arts, major in Molecular Biology, summa cum laude

2001-2002 **Brethern Colleges Abroad, University of Strasbourg,** Strasbourg, France

1995-1999 **Sycamore High School,** Cincinnati, OH

RESEARCH EXPERIENCE

2015 – **Dana-Farber Cancer Institute**, Boston, MA
Post-doctoral researcher in the laboratories of Drs. W. Nicholas Haining and Arlene H. Sharpe
Project: Dissecting Mechanisms of PD-1 Blockade with Single-Cell RNA-Sequencing

2012-2014 **Duke University, Department of Internal Medicine,** Durham, NC
Recipient of the Duke Faculty Resident Research Grant, 2013
Internal Medicine resident working with Dr. Aimee Zaas
Project: Diagnosing Aspergillosis with Whole Blood Transcriptional Signatures

2005-2009 **Washington University, Department of Pathology and Immunology,** St. Louis, MO
Graduate student in the laboratory of Dr. Herbert (Skip) W. Virgin IV
Thesis: The Functions of Autophagy Genes in Lymphocytes and Osteoclasts

2001-2003 **Princeton University, Department of Molecular Biology,** Princeton, NJ
Becker Scholar Research Fellow, summer 2001
Undergraduate student in the laboratory of Dr. Lynn Enquist
Thesis: The Search for an ICP47 Homologue in PRV: Initial Characterization of the Putative UL21.5 Gene

2000 **Webb-Waring Institute for Cancer, Aging, and Antioxidant Research,** Denver, CO
Brian Fitzgerald Fellow, summer 2000
Undergraduate student in the laboratory of Dr. John Repine

1999 **University of Cincinnati/Children's Hospital Research Center,** Cincinnati, OH
High school student in the laboratory of Dr. Jeffrey Whitsett

FORMAL TEACHING/MENTORING EXPERIENCE

2018- **Resident Tutor**, Leverett Undergraduate House, Harvard University
Advise students and help build community in a Harvard Undergraduate House

2014 **Assistant Chief Resident**, Duke University Hospital
Lead case conferences, medical student lectures, and one-on-one patient case discussions

2005-2006 **Teaching assistant**, medical student physiology course, Washington University School of Medicine

AWARDS

2019 AACR Scholar-in-Training Award, travel award to attend AACR Annual Meeting 2019
2018 Keystone Symposia Scholarship, travel award to Keystone conference
2017 Medical Oncology Board Certification, American Board of Internal Medicine
2017 AACR Scholar-in-Training Award, travel award to attend AACR Annual Meeting 2017
2017 Keystone Symposia Future of Science Fund scholarship, travel award to Keystone conference
2015 Resident Teaching Award, awarded by the Harvard Medical School Class of 2015
2014 Internal Medicine Board Certification, American Board of Internal Medicine
2014 Duke Appleseed Teaching Award, awarded by the Duke Medical School Class of 2014
2013 Duke Faculty Resident Research Grant
2012 Duke Appleseed Teaching Award, awarded by the Duke Medical School Class of 2012
2012 National American College of Physicians Associates Clinical Vignette Poster Winner
2012 North Carolina American College of Physicians Best Poster Award
2010 Elected to Alpha Omega Alpha Honor Medical Society
2009 Stanley J Korsmeyer Young Investigator Award, Best Poster Award, Association of American Physicians
2008 Kauffman Life Science Entrepreneurship Fellowship Recipient
2005 The McGraw-Hill/Appleton & Lange Medical Student Book Award for academic achievement
2003 Highest Graduating Honors, Department of Molecular Biology
2003 Senior Thesis Prize in Molecular Biology
2003 Phi Beta Kappa Society Prize for Academic Excellence
2002 Elected to Phi Beta Kappa Society
2001 Shapiro Prize for Academic Excellence
2000 First Annual Brian Fitzgerald Fellow, funded research at the Webb-Waring Institute
2000 Princeton President's Award for Academic Achievement

ONGOING FUNDING

2018-2020 **KL2/CMeRIT Award**
PI: Miller, Brian C

2018-2019 **ASCO Young Investigator Award**
PI: Miller, Brian C

COMPLETED FUNDING

2016-2018 **AACR-Bristol-Myers Squibb Fellowship in Translational Immuno-oncology**
PI: Miller, Brian C

2016-2017 **Wong Family Award**, Internal Dana-Farber Cancer Institute Research Grant
PI: Miller, Brian C

PEER-REVIEWED PUBLICATIONS

1. LaFleur MW, Nguyen TH, Coxe MA, **Miller BC**, Yates KB, Gaudiano EF, Sen DR, Gillis JE, Al Abosy R, Freeman GJ, Haining WN, Sharpe AH. *Ptpn2* regulates the generation of exhausted $CD8^+$ T cell subpopulations and restrains anti-tumor immunity. *Nature Immunol*. *In press*.

2. **Miller BC[1]**, Sen DR[1], Al Abosy R, Bi K, Virkud YV, LaFleur MW, Yates KB, Lako A, Felt K, Naik GS, Manos M, Gjini E, Kuchroo JR, Ishizuka JJ, Collier JL, Griffin GK, Maleri S, Comstock DE, Weiss SA, Brown FD, Panda A, Zimmer MD, Manguso RT, Hodi FS, Rodig SJ, Sharpe AH, Haining WN. Functionally specialized subsets of exhausted $CD8^+$ T cells mediate tumor control and differentially respond to checkpoint blockade. *Nature Immunol*. 2019 Mar; 20(3):326-336.
   [1]These two authors contributed equally to this manuscript.

3. Ishizuka JJ, Manguso RT, Cheruiyot CK, Bi K, Panda A, Iracheta-Vellve A, **Miller BC**, Du PP, Yates KB, Dubrot J, Buchumenski I, Comstock DE, Brown FD, Ayer A, Kohnle IC, Pope HW, Zimmer MD, Sen DR, Lane-Reticker SK, Robitschek EJ, Griffin GK, Collins NB, Long AH, Doench JG, Kozono D, Levanon EY, Haining WN. Loss of ADAR1 in tumors overcomes resistance to immune checkpoint blockade. *Nature.* 2019 Jan; 565(7737):43-48.

4. Jenkins RW, … **Miller BC** *et al*. Ex Vivo Profiling of PD-1 Blockade Using Organotypic Tumor Spheroids. *Cancer Discov.* 2018 Feb; 8(2):196-215.

5. Manguso RT, Pope HW, Zimmer MD, Brown FD, Yates KB, **Miller BC**, Collins NB, Bi K, LaFleur MW, Juneja VR, Weiss SA, Lo J, Fisher DE, Miao D, Van Allen E, Root DE, Sharpe AH, Doench JG, Haining WN. In vivo CRISPR screening identifies Ptpn2 as a cancer immunotherapy target. *Nature*. 2017 Jul 27; 547(7664):413-418.

6. **Miller BC**, Maus MV. CD19-Targeted CAR T cells: A New Tool in the Fight against B Cell Malignancies. *Onc Res Treat*. 2015 Epub Nov 18; 38(12):683-690.

7. Pei B, Zhao M, **Miller BC**, Vela JL, Bruinsma MW, Virgin HW, Kronenberg M. Invariant NKT cells require autophagy to coordinate proliferation and survival signals during differentiation. *J Immunol.* 2015 Jun 15;194(12):5872-84.

8. DeSelm CJ[1], **Miller BC**[1], Zou W, Beatty WL, van Meel H, Takahata Y, Klumperman J, Tooze SA, Teitelbaum SL, Virgin HW. Autophagy proteins regulate the secretory component of osteoclastic bone resorption. *Dev Cell.* 2011 Nov 15;21(5):966-74.
   [1]These two authors contributed equally to this manuscript.

9. Stephenson LM[1]**, Miller BC[1]**, Ng A, Eisenberg J, Zhao Z, Cadwell K, Graham DB, Mizushima NN, Xavier R, Virgin HW, Swat W. Identification of Atg5-dependent transcriptional changes and increases in mitochondrial mass in Atg5-deficient T lymphocytes. *Autophagy.* 2009 Jul;5(5):625-35.
   [1]These two authors contributed equally to this manuscript.

10. Zhao Z, Fux B, Goodwin M, Dunay IR, Strong D, **Miller BC**, Cadwell K, Delgado MA, Ponpuak M, Green KG, Schmidt RE, Mizushima N, Deretic V, Sibley LD, Virgin HW. Autophagosome-independent essential function for the autophagy protein Atg5 in cellular immunity to intracellular pathogens. *Cell Host Microbe.* 2008 Nov 13;4(5):458-69.

11. **Miller BC**, Zhao Z, Stephenson LM, Cadwell K, Pua HH, Lee HK, Mizushima NN, Iwasaki A, He YW, Swat W, Virgin HW 4th. The autophagy gene ATG5 plays an essential role in B lymphocyte development. *Autophagy*. 2008 Apr 1;4(3):309-14.

12. Zhao Z, Thackray LB, **Miller BC**, Lynn TM, Becker MM, Ward E, Mizushima NN, Denison MR, Virgin HW 4th. Coronavirus replication does not require the autophagy gene ATG5. *Autophagy*. 2007 Nov-Dec;3(6):581-5.

INVITED TALKS

1. **AACR Annual Meeting 2019**, April 1, 2019, Atlanta, GA
   Title: Functionally Specialized Subsets of Exhausted $CD8^+$ T Cells Mediate Tumor Control and Differentially Respond to Checkpoint Blockade

2. **AACR Annual Meeting 2017**, April 3, 2017, Washington, DC
   Title: Dissecting Mechanisms of PD-1 Blockade with Massively Parallel Single-Cell RNA-Sequencing

3. **Keystone Symposia on Cancer Immunology and Immunotherapy**, March 23rd, 2017, Whistler, British Columbia, Canada
   Title: Dissecting Mechanisms of PD-1 Blockade with Massively Parallel Single-Cell RNA-Sequencing

4. **SelectBio Cancer Immunotherapy and Biofluid Biopsies**, November 2, 2016, Boston, MA
   Title: Dissecting Mechanisms of PD-1 Blockade with Massively Parallel Single-Cell RNA-Sequencing

5. **AACR Tumor Immunology and Immunotherapy**, October 22, 2016, Boston, MA
   Title: Dissecting Mechanisms of PD-1 Blockade with Massively Parallel Single-Cell RNA-Sequencing

CONFERENCE POSTER PRESENTATIONS

1. **Miller BC**, Sen DR, Al Abosy R, Bi K, Yates K, Gjini E, Felt K, Manguso R, Rodig SJ, Sharpe AH, Haining WH. Distinct Subsets of Dysfunctional $CD8^+$ T Cells Underlie Response to Checkpoint Blockade. AACR Annual Meeting. 2018; Apr 14-18.

2. **Miller BC**, Sen DR, Al Abosy R, Bi K, Yates K, Gjini E, Felt K, Manguso R, Rodig SJ, Sharpe AH, Haining WH. Shared States of T Cell Dysfunction between LCMV and Cancer Underlie Response to Checkpoint Blockade. Keystone Symposia on T Cell Dysfunction, Cancer and Infection. 2018; Jan 16-20.

3. **Miller BC**, Wadsworth MH 2nd, Bi K, Hughes TK, Sharpe AH, Shalek AK, Haining WN. Dissecting Mechanisms of PD-1 Blockade with Single-Cell RNA-Sequencing. AACR Tumor Immunology and Immunotherapy. 2016; Oct 20-23.
   - ❖ Invited to give a short talk

4. **Miller BC**, Wadsworth MH 2nd, Bi K, Hughes TK, Sharpe AH, Shalek AK, Haining WN. Single-Cell RNA-Seq allows deep analysis of the tumor immune microenvironment. Society of Hematologic Oncology meeting. 2016; Sept 7-10.

5. **Miller BC,** DeSelm CJ, Zou W, Beatty WL, van Meel E, Takahata Y, Klumperman J, Tooze SA, Teitelbaum SL, Virgin HW. Autophagy proteins regulate the secretory component of osteoclastic bone resportion. North Carolina chapter meeting of the American College of Physicians. 2013; Feb 8-9.

6. **Miller BC**, Zhang T, Kaplan DM. Non-infectious mimics of infectious diseases: A case presentation of new onset Crohn's disease. National conference of the American College of Physicians. 2012; Apr 22-24.
   - ❖ Awarded the 2012 North Carolina Chapter Best Poster Award
   - ❖ Awarded the 2012 National ACP Associates Clinical Vignette Poster Winner

7. **Miller BC**, Stephenson LM, Ng A, Eisenberg J, Zhao Z, Cadwell K, Graham DB, Mizushima NN, Xavier R, Swat W, Virgin HW. The essential autophagy gene Atg5 is required for mitochondrial maintenance in T cells. Conference of the American Society for Clinical Investigation/Association of American Physicians. 2009; Apr 24-26.
   - ❖ Awarded the Stanley J Korsemeyer Young Investigator Award

8. **Miller BC**, Zhao Z, Stephenson LM, Swat W, Virgin HW. The autophagy gene Atg5 is essential for normal differentiation of murine B cells. Keystone Symposium on Autophagy in Health and Disease. 2007; Apr 15-20.