

CURRICULUM VITAE

Michael B. Jordan, M.D.

PERSONAL DATA

Divisions of Immunobiology, and
Bone Marrow Transplantation and Immune Deficiency
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EDUCATION

1989 BA University Scholars, Cum Laude, Baylor University, Waco, Texas
1993 MD U.T. Southwestern Medical School, Dallas, Texas

POSTDOCTORAL TRAINING

7/93-7/96 Resident, Pediatrics, Children's Medical Center (Dallas), UT Southwestern Medical School
7/96- 2/02 Fellow, Pediatric Hematology/Oncology, The Children's Hospital, University of Colorado Health Science Center (7/96 -7/97- clinical appointment, 8/97-2/02- research appointment)
8/97- 7/02 Research Fellow/Group Member, Kappler/Marrack laboratory, HHMI, National Jewish Medical and Research Center, University of Colorado Health Science Center (concurrent with fellowship position above) Area: basic Immunology

LICENSURE AND BOARD CERTIFICATIONS

1993-1996 Texas state medical license
1996- Diplomate, American Board of Pediatrics
1996-2008 Colorado state medical license
2002- Subspecialty Board, Pediatric Hematology/Oncology
2005- Ohio state medical license

ACADEMIC APPOINTMENTS

7/02-7/03 Instructor, Pediatric Hematology/Oncology, University of Colorado Health Science Center and The Children's Hospital
7/03-7/04 Assistant Professor, Pediatric Hematology/Oncology University of Colorado Health Science Center and The Children's Hospital
7/04- 9/11 Assistant Professor, Immunobiology and Hematology/Oncology/BMT, Cincinnati Children's Hospital and the University of Cincinnati, Cincinnati, OH

9/11-2/17	Associate Professor, with tenure, Immunobiology and Bone Marrow Transplantation/ Immune Deficiency, Cincinnati Children's Hospital and the University of Cincinnati, Cincinnati, OH
3/17-present	Professor of Pediatrics, Divisions of Immunobiology and Bone Marrow Transplantation/ Immune Deficiency, Cincinnati Children's Hospital Medical Center and the University of Cincinnati, Cincinnati, OH

HONORS AND AWARDS

2001	Melvin Garb Endowed Fellowship in Basic Immunology- NJC
2003	Nezelof Prize in basic research, The Histiocyte Society
2007	Artemis Fellowship, The Nikolas Symposium
2009	Nezelof Prize in basic research, The Histiocyte Society
2012	Best Abstract Award, 2012 Tandem BMT meeting (ASBMT/CIBMTR)

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

- Member, The Histiocyte Society, 2004-
- Member, Children's Oncology Group, 1999-
- Member, American Society of Hematology, 1998-
- Member, American Association of Immunologists, 2006-
- Member, American Society of Blood and Marrow Transplantation, 2009-
- Member, Clinical Immunology Society, 2012-
- Member, American Society of Pediatric Hematology/Oncology, 2014-

LEADERSHIP AND MANAGEMENT

AAI, Clinical immunology Committee, (national) 2013-2016

- Member, Scientific Committee, The Histiocyte Society (International) 2005-2011
- Chairman, Scientific Committee, The Histiocyte Society (International) 2009-2011
- Member at large (Executive Board) The Histiocyte Society (International) 2011- 2014
- Secretary, The Histiocyte Society (International) 2014- 2017
- President-Elect, The Histiocyte Society (International) 2017-19
- President, The Histiocyte Society (International) 2019-22

The HIT-HLH trial: I initiated this clinical trial locally, then recruited a network of sites/ investigators across the US and Canada to conduct this clinical trial.

CLINICAL ACTIVITIES

- Attending, bone marrow transplant unit, approx. 6 weeks/ yr
- Attending, immunodeficiency and histiocytosis clinic, 0.5 days/ week
- I maintain a national and international referral practice for children which have HLH or other unusually difficult immune deficiencies/ immune regulatory disorders.
- I am one of the most recognized experts (nationally and internationally) for the care of children with HLH. I serve as the scientific director the CCHMC HLH center of excellence. I have also developed unique and increasingly recognized expertise in other immune regulatory disorders, including LRBA and CTLA4 deficiencies.

SERVICE AND CITIZENSHIP

1. Committee Involvement

Member, Hematology/Oncology, scientific review committee (local) 2005-2008
Member, Immunobiology/Mol. Immunology scientific review committee (local) 2006-2010
Member, Search Committee for new chief of Hematology, CCHMC, 2013
Member, Search Committee for new chief of Infectious Diseases, CCHMC, 2015
Member, Search Committee for CTIMM faculty recruit, CCHMC, 2015/6
Member, Search Committee for food allergy center director, CCHMC, 2016
Member, MSTP promotion board, 2015-present

2. Professional activities

Grant reviewer, The Histiocytosis Association of America (national), 2005-2011
(2009-2011, chair/organizer of grant review process)
Grant reviewer, NIH, Partnerships for Biodefense Panel (ZAI1-NLE-M-J3), 2010
Grant reviewer, American Heart Association, 2013/14
Grant reviewer, French National Research Agency, 2013
Member, Working group on designing trials for uncommon diseases and therapeutics, NHLBI, 2016

3. Distinguished activities

Invited Presentations:

- 2012 Albany Medical College Immunology Seminar Series "Lymphocyte Cytotoxicity, Interferon Gamma, and Immunopathology: Unexpected Connections"

University of Iowa Medical and Pediatric Grand Rounds (September) "Hemophagocytic Lymphohistiocytosis"
- 2013 Heme/Onc grand rounds, Methodist Hospital, Houston
"The delicate balance of immune regulation and its disruption in Hemophagocytic Lymphohistiocytosis (HLH)"
- 2014 Invited speaker, Tandem BMT meeting (ASBMT/ CIBMTR)
"New Treatments for Hemophagocytic Lymphohistiocytosis"

Invited Speaker, Clinical Immunology Society
"Abatacept and lymphocytic interstitial lung disease: updates and mechanistic studies"

Invited Speaker, 46th Congress of the International Society of Paediatric Oncology
"Evolving understanding and treatment of Hemophagocytic Lymphohistiocytosis"
- 2015 Invited Speaker, Pediatric Heme/ Onc Grand Rounds- Children's Hospital of Dallas
"New insights into the unique immune regulatory disorder, Hemophagocytic Lymphohistiocytosis"

Invited Speaker, Pediatric Heme/ Onc Grand Rounds- New York-Presbyterian Morgan Stanley Children's Hospital/ Columbia Univ.
"Hemophagocytic lymphohistiocytosis (HLH): improving understanding and treatment"

Invited Speaker, 26th annual Histiocyte Society meeting, Athens, Greece,
"Hemophagocytic lymphohistiocytosis (HLH): what are we really talking about?"

Invited Speaker, Korean Society of Hematology, presidential symposium (Daegu, Korea) "Updates regarding Hemophagocytic Lymphohistiocytosis (HLH)"

Invited speaker, International Symposium of Pediatric Lymphohistiocytic Diseases (Hangzhou, China) "Pathogenesis of Hemophagocytic Lymphohistiocytosis (HLH)"

Invited speaker, First Affiliated Hospital of Guangxi Medical University (Nanning, China), "Hemophagocytic lymphohistiocytosis (HLH): improving understanding and treatment"

2016

Invited Speaker, Clinical Immunology Society
"Treatment of 'T_{reg}opathies': LRBA, CTLA4, and other genetic lesions"

Invited speaker, American Society of Pediatric Hematology Oncology, educational symposium "Hemophagocytic lymphohistiocytosis (HLH): salvage and novel therapies"

Invited speaker, 21st congress of The European Hematology Association,
"Hemophagocytic lymphohistiocytosis: Pathophysiology and Treatment"

Invited speaker, Seattle Children's Hospital "Hemophagocytic lymphohistiocytosis: new insights and new treatments for a unique immunoregulatory disorder"

Invited speaker, The Histiocyte Society meeting, 27th annual meeting, Dublin, Ireland,
"Targeting interferon gamma (IFN-g), the driver cytokine in HLH"

Invited Keynote Speaker, 6th Annual Ohio River Valley Cytometry Association, "Immune Regulatory Disorders: Lymphocytes Acting Badly"

Monthly ACMG Genomics Case Conference series speaker

2017

Invited speaker, The Society for Hematopathology meeting, "Hemophagocytic lymphohistiocytosis: A unique immunoregulatory disorder"

Invited speaker, 4th International conference on PID, Bangalore, India

Invited speaker, Henry Kunkel Society Meeting,

Invited speaker, The Children's Hospital, Colorado,

Invited speaker, Univ. of Oklahoma,

Invited speaker, Primary Immune Deficiency Treatment Consortium Meeting, Washington DC

Invited Speaker, Henry Ford Hospital, Detroit

2018

Invited Speaker, Children's Hosp., Univ of Pittsburgh

Invited Speaker, 6th Beijing International Conference on Histiocytosis

Invited Speaker, European Society for Immunodeficiencies

Invited Speaker, 34th annual meeting of the Histiocyte Society

Invited Speaker, Texas Children's Hospital, Houston

- 2019 Medical grand rounds, British Columbia Children's Hosp. and Vancouver General Hosp.
- 2020 AFLAC visiting Professor, Children's Hosp. of Atlanta
Invited Speaker: 2nd International Symposium on Pediatric Lymphohistiocytic Diseases
Hangzhou, China
- 2021 Invited Speaker: Indian Society of Primary Immune Deficiency, Lucknow, India (virtual)

4. Manuscript review/ editorial services

Blood 2/ yr

Journal of Allergy and Clinical Immunology 2-3 / year

The Journal of Immunology 2 / year

New England Journal of Medicine 1/ 2 years

Pediatric Blood and cancer 2-3/year

Journal of Allergy and Clinical Immunology, 2-3/year

Associate editor, Frontiers in Immunology/ Primary Immunodeficiencies, 2015-

5. Recruitment activities

Participated in interviewing applicants for:

CCHMC Hematology/Oncology fellowship

Immunobiology PhD and MSTP (MD/PhD) programs

Academic track pediatric residency (MD PhD applicants)

6. Local activities to benefit CCHMC

Co-Organizer, Cancer and Blood Diseases Institute Seminar Series, 2005-2010

Co-Organizer, Immunobiology graduate program retreat, 2009-2013

Speaker/organizer, CCHMC annual HLH conference ('HLH bootcamp') 2009-2016

Co-Organizer, Immunology speaker series, 2016-

TEACHING

Graduate Students mentored (Immunobiology graduate program)

Erin Zoller- PhD. 2011 (mentor)- now Post-doctoral Scientist with John Harley

Rama Dhenni, Ms, 2016 (mentor)

Thesis Committee member:

G. Suidan (PhD., 2008)

J. Mitchell (PhD., 2010)

S. Kurtulus (PhD., 2012)

Jonathan McNalley (PhD, 2015)

Jared Klarquist (PhD, 2016)

Rama Denni (MS, 2016)

Kun-Po Li (PhD, 2016)

Sharmila Shanmuganad (PhD, ongoing)

Fellows mentored (clinical and post-doctoral)

Theodore Johnson, MD/PhD. Post-doctoral fellow (2010- 2012) - now Assistant Prof. at Medical College of Georgia

Robert Thacker, PhD- Post-doctoral fellow (2010- 2012)

Scott Millen PhD.- Post-doctoral fellow (2012- 2014)

Shanmuganathan Chandrakasan, MD- Clinical Research Fellow, co-mentored with P. Malik (2012-2015)

Marjan Tajrishi, PhD - Post-doctoral fellow (2015)

Vandana Chatevurdi, PhD - Post-doctoral fellow (2015-)

Hani Alrefai, PhD (2016- 2018)

John Erickson (2018-)

Teaching

Lectures: approx. 3/ yr to Immunobiology graduate students, 2/ yr to Heme /Onc fellows

Led the advanced topics seminar for Immunobiology graduate students, 2011 and 2015

RESEARCH AND SCHOLARLY ACTIVITIES

Ongoing clinical trials

An Open-label, Single Arm, Multicenter Study to Broaden Access to Emapalumab, an Anti-Interferon Gamma (Anti-IFN γ) Monoclonal Antibody, and to Assess its Efficacy, Safety, Impact on Quality of Life, and Long-term Outcome in Pediatric Patients with Primary Hemophagocytic Lymphohistiocytosis (NI-0501-09) Role: North American Primary Investigator

Founding member, and CCHMC PI, the North American Consortium for Histiocytosis (NACHO), a clinical trials network devoted to conducting clinical trials and research studies in the histiocytoses

Ongoing research support

R21CA256390 12/20-12/22 Jordan (PI)

Redefining hemophagocytic lymphohistiocytosis in hematologic malignancies

This project seeks to define the pathophysiologic basis of hemophagocytic lymphohistiocytosis occurring in patients with cancer but who typically do not have impairments of cytotoxic function.

Role: Principal Investigator

NI-0501-09 9/19-9/22

Novimmune/ Sobi inc

An Open-label, Single Arm, Multicenter Study to Broaden Access to Emapalumab, an Anti-Interferon Gamma (Anti-IFN γ) Monoclonal Antibody, and to Assess its Efficacy, Safety, Impact on Quality of Life, and Long-term Outcome in Pediatric Patients with Primary Hemophagocytic Lymphohistiocytosis

This clinical trial seeks to broaden access to and test the utility of emapalumab for patients with HLH.

Role: Principal Investigator

St Baldrick's Foundation 7/14- current 0.24 calendar

North American Consortium for Histiocytosis (NACHO)

Role: Co-Investigator

This grant funds a network of investigators focused of improving treatment for children with histiocytic disorders. I and CCHMC are founding members of this consortium.

Completed research support

R21AI142266 1/19-11/20 1.2 calendar

Targeted manipulation of the DNA damage response for prevention/treatment of GVHD

Role: Principal Investigator

This project seeks to develop drugs targeting the DDR as therapeutics for GVHD.

CCTST T1: "Development of complementary, targeted therapies for hemophagocytic lymphohistiocytosis (HLH)" \$60,000 7/18-7/19 0 calendar
 Role: Co-Principal Investigator (with D Plas)
 This projects seeks to investigate mechanisms of mTOR activation seen after IFN-g blockade, and with translational therapeutic endpoints.

CCHMC RIP: "A chimeric protein probe for detecting targets of perforin-mediated killing *in vivo*" \$75,000 10/18-9/19 0 calendar
 Role: Principal Investigator
 This project seeks to develop novel tools for detecting targets of cytotoxic killing in vivo.

1R21AI132822-01 (Jordan and Herr) 6/17-6/19 1.2 calendar
 NIH/NIAID \$150,000/yr
 Role: Co-Principal Investigator
 Mechanisms of LRBA-mediated control of CTLA4
 This project seeks to further define the cellular and biophysical basis for LRBA mediated regulation of CTLA4 protein levels.

The Jeffrey Modell Foundation
 "Mechanisms of LRBA-mediated immune regulation."
 \$50,000/yr
 Role: Principal Investigator 7/16- 7/18 0 calendar
 This project seeks to further define the cellular and biophysical basis for LRBA mediated immune regulation

CCHMC, The Center for Pediatric genomics (CPG) 0 calendar
 N-CoR, lymphoid development, and severe combined immune deficiency
 \$50,000/yr
 Role: Principal Investigator 7/16- 7/18 0 calendar
 This project seeks to define the causal role of novel mutations in N-CoR identified in a patient with severe combined immune deficiency.

1R01AI109810-01A1 (Jordan and Hildeman) 7/14-4/18 2.4 calendar
 NIH/NIAID \$250,000/yr (4 year project length)
 Role: Co-Principal Investigator
 "Exploiting the DNA damage response to selectively sculpt the T cell repertoire"
 This project seeks to define the mechanisms and pre-clinical potential of manipulating DNA damage response signaling pathways for treatment of immune mediated diseases.

R34HL107801-01 (Jordan) 3/12-3/17 1.2 calendar
 NIH/NHLBI \$150,000/yr (3 year project length)
 Role: Principal Investigator
 'Hybrid ImmunoTherapy (ATG/Dexamethasone/Etoposide) for Hemophagocytic LymphoHistiocytosis'
 This project is a clinical trial testing the feasibility of a novel treatment regimen for patients with newly diagnosed HLH.

The Histiocytosis Association
 \$50,000 12/14-12/16 0 calendar
 Role: Principal Investigator

'Gene expression in an Animal model of hemophagocytic lymphohistiocytosis'

The project seeks to better understand how HLH develops through gene expression studies of various cell types from animals with HLH.

PO1-AR048929 (Glass)

9/11-9/16

0.6 calendar

NIAMS

Project #4 PI: Grom "Pathobiology of Monomyelocytoid Signature in Systemic Juvenile Idiopathic Arthritis and Macrophage Activation Syndrome"

Role: Co-Investigator Total budget: \$ 978,277/yr

Gene Expression in Pediatric Arthritis

The overall goal of this project is to further define the pathogenesis and improve therapy for patients with juvenile idiopathic arthritis by studying gene expression. This grant supports collaborative efforts with Dr Grom.

CCHMC, Center for Technology Commercialization (CTC) Innovation award (Jordan)

\$100,000/yr

7/14-7/16

0 calendar

Role: Principal Investigator

"Exploiting the DNA damage response to develop new therapies for immunologic diseases"

This award supports efforts to further develop intellectual property related to novel methods of inhibiting the immune response, in order to enhance its commercialization potential.

CCTST T1 Award (Jordan)

7/14-7/15

0 calendar

\$100,000

'Creating an 'off switch' for harmful immune responses"

Role: Principal Investigator

This collaborative project (with D. Plas at UC) seeks to define the intersection between the PI3K signaling pathway and the DNA damage response pathway, as relating to therapeutic destruction of pathologic T cells.

American Society of Hematology Bridge Award

4/14-4/15

0 calendar

\$150,000

Role: Principal Investigator

This award supports meritorious hematology-related research that does not currently have substantial NIH funding.

R01 NS060881 (Johnson)

8/01/09- 7/31/14

1.0 calendar

NIH/NINDS

\$15,301/yr

'CD8 T cell control of the blood brain barrier'

Role: Co-Investigator

The goal of this study is to define the mechanisms of CD8 T cell dependent blood brain barrier disruption, as seen in viral infection and other inflammatory conditions.

CCTST T1 Award (Jordan)

7/12-7/13

0 calendar

\$100,000

'Gene therapy for hemophagocytic lymphohistiocytosis'

Role: Co-Principal Investigator

This collaborative project (with Malik and Risma labs) seeks to develop lentiviral gene correction as a viable strategy which may be tested in a clinical trial for HLH due to *prf1* mutations.

CCHMC Innovation Award (Jordan+ Hildeman) 7/12-7/13

0 calendar

\$75,000

'Targeted immunotherapy tailored to effector T cells'

Role: Co-Principal Investigator

This collaboration seeks to develop p53 activation/ MDM2 inhibition as an immunotherapeutic strategy for selectively eliminating unwanted immune responses.

The Histiocytosis Association of America 12/12-12/13 0.0 calendar

Role: Principal Investigator \$50,000 total

'Focused screening of novel therapies for HLH using an animal model'

This study proposes to utilize animal models of HLH to screen for novel therapies that may hold translational value.

R01 HL091769 (Jordan) 8/10/07-6/30/13 4.8 calendar

NIH/NHLBI \$250,000/yr

Role: Principal Investigator

'An Animal Model of Hemophagocytic Lymphohistiocytosis'

This study proposes to define the basis of immune dysregulation in hemophagocytic lymphohistiocytosis, utilizing an animal model.

Completed clinical trials

A Pilot, Open-label, Single Arm, Multicentre Study to Explore Safety, Tolerability, Pharmacokinetics and Efficacy of Intravenous Multiple Administrations of NI-0501, an Anti-interferon Gamma (Anti-IFN γ) Monoclonal Antibody, in Paediatric Patients With Primary Haemophagocytic Lymphohistiocytosis

US Principal investigator (sponsored by Novimmune SA)

2014- 2019

Hybrid Immunotherapy for Hemophagocytic Lymphohistiocytosis

Initiator, coordinator, and principal investigator for the HIT-HLH network

2012-2016

PUBLICATIONS

1. Frizzell R. T., F. M. Fichtel, **M. B. Jordan**, B. E. Weprin, D. J. Borchers, E. C. Allen, W. R. Pogue, and H. H. Batjer. Effects of etomidate and hypothermia on cerebral metabolism and blood flow in a canine model of hypoperfusion. *J. Neurosurg. Anesthesiol.* 5:104-110, 1993.
2. **Jordan, M. B.** and T. J. Abramo. Occurrence of herpetic whitlow in a twelve-day-old infant. *Pediatr. Infect. Dis. J.* 13:832-833, 1994.
3. Marrack, P., J. Bender, D. Hildeman, **M. Jordan**, T. Mitchell, M. Murakami, A. Sakamoto, B. C. Schaefer, B. Swanson, and J. Kappler. Homeostasis of alpha beta TCR+ T cells. *Nat. Immunol.* 1:107-111, 2000.
4. Marrack, P., J. Bender, **M. Jordan**, W. Rees, J. Robertson, B. C. Schaefer, and J. Kappler. Major histocompatibility complex proteins and TCRs: do they really go together like a horse and carriage? *J. Immunol.* 167:617-621, 2001.
5. Kedl, R. M., **M. Jordan**, T. Potter, J. Kappler, P. Marrack and S. Dow. CD40 stimulation accelerates deletion of tumor-specific CD8(+) T cells in the absence of tumor-antigen vaccination. *Proc. Natl. Acad. Sci. USA.* 98:10811-10816, 2001.

6. **Jordan, M. B.**, N. van Rooijen, S. Izui, J. Kappler and P. Murrack. Liposomal clodronate as a novel agent for treating autoimmune hemolytic anemia in a mouse model. *Blood*. 101:594-601, 2003.
7. **Jordan, M.B.**, D. M. Mills, J. Kappler, P. Murrack and J. C. Cambier. Promotion of B cell immune responses via an alum-induced myeloid cell population. *Science*. 304:1808-10, 2004.
8. **Jordan, M. B.**, Hildeman D, Kappler J, Murrack P. An animal model of hemophagocytic lymphohistiocytosis (HLH): CD8+ T cells and interferon gamma are essential for the disorder. *Blood*. 104:735-743, 2004.
9. **Jordan, M. B.**, McClain KL, Yan X, Hicks J, Jaffe R. Anti-CD52 Antibody, Alemtuzumab, binds to Langerhans cells in Langerhans cell histiocytosis. *Pediatric Blood and Cancer* 44:251-254, 2005.
10. Hoffmann P. R., J. A. Kench, A. Vondracek, E. Kruk, D.L. Daleke, **M. Jordan**, P. Murrack, P.M. Henson and V. A. Fadok. Interaction between Phosphatidylserine and the Phosphatidylserine Receptor Inhibits Immune Responses In Vivo. *J. Immunol*. 174:1393-404, 2005.
11. Mathes M., **Jordan M.**, Dow S. Evaluation of liposomal clodronate in experimental spontaneous autoimmune hemolytic anemia in dogs. *Exp Hematol*. 2006 Oct;34(10):1393-402.
12. Zaks K*, **Jordan M***, Guth A, Sellins K, Kedl R, Izzo A, Bosio C, Dow S. Efficient immunization and cross-priming by vaccine adjuvants containing TLR3 or TLR9 agonists complexed to cationic liposomes. *J Immunol*. 2006 Jun 15;176(12):7335-45. (*= contributed equally to published work)
13. Wojciechowski S, **Jordan MB**, Zhu Y, White J, Zajac AJ, Hildeman DA. Bim mediates apoptosis of CD127(lo) effector T cells and limits T cell memory. *Eur J Immunol*. 2006 Jul;36(7):1694-706.
14. Bhatla D, Davies SM, Shenoy S, Harris RE, Crockett M, Shoultz L, Smolarek T, Bleesing J, Hansen M, Jodele S, **Jordan M**, Filipovich AH, Mehta PA. Reduced-intensity conditioning is effective and safe for transplantation of patients with Shwachman-Diamond syndrome. *Bone Marrow Transplant*. 2008 Aug;42(3):159-65.
15. **Jordan MB**, Filipovich AH. Hematopoietic cell transplantation for hemophagocytic lymphohistiocytosis: a journey of a thousand miles begins with a single (big) step. *Bone Marrow Transplant*. 2008 Oct;42(7):433-7
16. Urrea Moreno R, Gil J, Rodriguez-Sainz C, Cela E, LaFay V, Oloizia B, Herr AB, Sumegi J, **Jordan MB**, Risma KA. Functional assessment of perforin C2 domain mutations illustrates the critical role for calcium-dependent lipid binding in perforin cytotoxic function. *Blood*. 2009 Jan 8;113(2):338-46.
17. Marsh RA, Villanueva J, Zhang K, Snow AL, Su HC, Madden L, Mody R, Kitchen B, Marmer D, **Jordan MB**, Risma KA, Filipovich AH, Bleesing JJ. A rapid flow cytometric screening test for X-linked lymphoproliferative disease due to XIAP deficiency. *Cytometry B Clin Cytom*. 2009 Mar 13;76B(5):334-344.

18. Marsh RA, Villanueva J, Kim MO, Zhang K, Marmer D, Risma KA, **Jordan MB**, Bleesing JJ, Filipovich AH. Patients with X-linked lymphoproliferative disease due to BIRC4 mutation have normal invariant natural killer T-cell populations. *Clin Immunol*. 2009 Jul;132(1):116-23.
19. Lin AA, Tripathi PK, Sholl A, **Jordan MB**, Hildeman DA. Gamma interferon signaling in macrophage lineage cells regulates central nervous system inflammation and chemokine production. *J Virol*. 2009 Sep;83(17):8604-15.
20. Lykens JE, Terrell CE, Zoller EE, Divanovic S, Trompette A, Karp CL, Aliberti J, Flick MJ, **Jordan MB**. Mice with a selective impairment of IFN-gamma signaling in macrophage lineage cells demonstrate the critical role of IFN-gamma-activated macrophages for the control of protozoan parasitic infections in vivo. *J Immunol*. 2010 Jan 15;184(2):877-85.
21. Manoli I, Golas G, Westbroek W, Vilboux T, Markello TC, Introne W, Maynard D, Pederson B, Tsilou E, **Jordan MB**, Hart PS, White JG, Gahl WA, Huizing M. Chediak-Higashi syndrome with early developmental delay resulting from paternal heterodisomy of chromosome 1. *Am J Med Genet A*. 2010 Jun;152A(6):1474-83.
22. Marsh RA, Madden L, Kitchen BJ, Mody R, McClimon B, **Jordan MB**, Bleesing JJ, Zhang K, Filipovich AH. XIAP deficiency: a unique primary immunodeficiency best classified as X-linked familial hemophagocytic lymphohistiocytosis and not as X-linked lymphoproliferative disease. *Blood*. 2010 May 20. [Epub ahead of print]
23. Marsh RA, Satake N, Biroeschak J, Jacobs T, Johnson J, **Jordan MB**, Bleesing JJ, Filipovich AH, Zhang K. STX11 mutations and clinical phenotypes of familial hemophagocytic lymphohistiocytosis in North America. *Pediatr Blood Cancer*. 2010 Jul 15;55(1):134-40.
24. Mehta PA, Vinks AA, Filipovich A, Bleesing J, Jodele S, **Jordan MB**, Marsh R, Tarin R, Edwards S, Fearing D, Lawrence J, Davies SM. Alternate day Miconazole Anti-fungal Prophylaxis in Pediatric patients undergoing Hematopoietic Stem Cell Transplantation: A Pharmacokinetic study. *Biol Blood Marrow Transplant*. 2010 May 20. [Epub ahead of print]
25. Marsh RA, Vaughn G, Kim MO, Li D, Jodele S, Joshi S, Mehta PA, Davies SM, **Jordan MB**, Bleesing JJ, Filipovich AH. Reduced-intensity conditioning significantly improves survival of patients with hemophagocytic lymphohistiocytosis undergoing allogeneic hematopoietic cell transplantation. *Blood*. 2010 Dec 23;116(26):5824-31. Epub 2010 Sep 20.
26. Lykens JE, Terrell CE, Zoller EE, Risma K, **Jordan MB**. Perforin is a critical physiologic regulator of T-cell activation. *Blood*. 2011 May 23. [Epub ahead of print]
27. Zoller EE, Lykens JE, Terrell CE, Aliberti J, Filipovich AH, Henson PM, **Jordan MB**. Hemophagocytosis causes a consumptive anemia of inflammation. *J Exp Med*. 2011 Jun 6;208(6):1203-14. Epub 2011 May 30.
28. Marsh RA, **Jordan MB**, Filipovich AH. Reduced-intensity conditioning haematopoietic cell transplantation for haemophagocytic lymphohistiocytosis: an important step forward. *Br J Haematol*. 2011 Sep;154(5):556-63

29. Zhang K, **Jordan MB**, Marsh RA, Johnson JA, Kissell D, Meller J, Villanueva J, Risma KA, Wei Q, Klein PS, Filipovich AH. Hypomorphic mutations in PRF1, MUNC13-4, and STXBP2 are associated with adult-onset familial hemophagocytic lymphohistiocytosis. *Blood*. 2011 Nov 24;118(22):5794-8. Epub 2011 Aug 31.
30. **Jordan MB**, Allen CE, Weitzman S, Filipovich AH, McClain KL. How I treat hemophagocytic lymphohistiocytosis. *Blood*. 2011 Oct 13;118(15):4041-52. Epub 2011 Aug 9.
31. Risma K, **Jordan MB**. Hemophagocytic lymphohistiocytosis: updates and evolving concepts. *Curr Opin Pediatr*. 2012 Feb;24(1):9-15.
32. Shin CR, Kim MO, Li D, Bleesing JJ, Harris R, Mehta P, Jodele S, **Jordan MB**, Marsh RA, Davies SM, Filipovich AH. Outcomes following hematopoietic cell transplantation for Wiskott-Aldrich syndrome. *Bone Marrow Transplant*. 2012 Nov;47(11):1428-35.
33. Rani R, **Jordan MB**, Divanovic S, Herbert DR. IFN- γ -Driven IDO Production from Macrophages Protects IL-4R α -Deficient Mice against Lethality during *Schistosoma mansoni* Infection. *Am J Pathol*. 2012 May;180(5):2001-8.
34. Borges M, Barreira-Silva P, Flórido M, **Jordan MB**, Correia-Neves M, and Appelberg R. Molecular and cellular mechanisms of *Mycobacterium avium*-induced thymic atrophy. *J Immunol*. 2012 Oct 1;189(7):3600-8. Epub 2012 Aug 24
35. Marsh RA, Rao K, Satwani P, Lehmborg K, Müller I, Li D, Kim MO, Fischer A, Latour S, Sedlacek P, Barlogis V, Hamamoto K, Kanegane H, Milanovich S, Margolis DA, Dimmock D, Casper J, Douglas DN, Amrolia PJ, Veys P, Kumar AR, **Jordan MB**, Bleesing JJ, Filipovich AH. Allogeneic hematopoietic cell transplantation for XIAP deficiency: an international survey reveals poor outcomes. *Blood*. 2012 Nov 6. [Epub ahead of print]
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Quality review of publications:

1. **Jordan, M.B.**, D. M. Mills, J. Kappler, P. Marrack and J. C. Cambier. Promotion of B cell immune responses via an alum-induced myeloid cell population. Science. 304:1808-10, 2004. This work describes a new mechanistic aspect of how alum (the most widely used vaccine adjuvant in the world) promotes immune responses *in vivo*. This work was an even collaboration between Dr Mills and myself. We conceived and performed all of this work with the input and support of Dr's Marrack and Cambier. Citations: 147 total, 64 in the last 5 years
2. **Jordan, M. B.**, Hildeman D, Kappler J, Marrack P. An animal model of hemophagocytic lymphohistiocytosis (HLH): CD8+ T cells and interferon gamma are essential for the disorder. Blood. 104:735-743, 2004. This work provided key insights into the pathogenesis of HLH and has become the basis for modern understanding of this disorder. I conceived and conducted these studies. Citations: 232 total, 116 in the last 5 years

3. Lykens JE, Terrell CE, Zoller EE, Divanovic S, Trompette A, Karp CL, Aliberti J, Flick MJ, **Jordan MB**. Mice with a selective impairment of IFN-gamma signaling in macrophage lineage cells demonstrate the critical role of IFN-gamma-activated macrophages for the control of protozoan parasitic infections in vivo. *J Immunol*. 2010 Jan 15;184(2):877-85.
This work, conducted in my lab, demonstrates, for the first time *in vivo*, that IFN- γ must act directly on macrophages for the control of a wide array of protozoan parasites. This work utilizes a unique transgenic mouse we created in which macrophages are selectively rendered insensitive to interferon gamma. **Citations:** 39 total, 31 in the last 5 years
4. Zoller EE, Lykens JE, Terrell CE, Aliberti J, Filipovich AH, Henson PM, **Jordan MB**. Hemophagocytosis causes a consumptive anemia of inflammation. *J Exp Med*. 2011 Jun 6;208(6):1203-14. Epub 2011 May 30.
This work, conducted in my lab, describes an entirely new aspect of interferon gamma biology and provides mechanistic insights into common clinical immunopathologic phenomena. **Citations:** 60 total, 45 in the last 5 years
5. **Jordan MB**, Allen CE, Weitzman S, Filipovich AH, McClain KL. How I treat hemophagocytic lymphohistiocytosis. *Blood*. 2011 Oct 13;118(15):4041-52. Epub 2011 Aug 9.
Though this is a review / opinion article, it has become an authoritative work guiding clinical care for patients with HLH and is one of the most ever downloaded articles in Blood's "How I Treat" series. **Citations:** 202 total, 161 in the last 5 years
6. Marsh RA, Allen CE, McClain KL, Weinstein JL, Kanter J, Skiles J, Lee ND, Khan SP, Lawrence J, Mo JQ, Bleesing JJ, Filipovich AH, **Jordan MB**. Salvage therapy of refractory hemophagocytic lymphohistiocytosis with alemtuzumab. *Pediatr Blood Cancer*. 2013 Jan;60(1):101-9.
This work is the only report related to second line treatment of HLH in the medical literature involving more than a few patients. I originated this clinical strategy and wrote this paper with colleagues. **Citations:** 33 in the last 5 years
7. Terrell CE, **Jordan MB**. Perforin deficiency impairs a critical immunoregulatory loop involving murine CD8(+) T cells and dendritic cells. *Blood*. 2013 Jun 27;121(26):5184-91. doi: 10.1182/blood-2013-04-495309. Epub 2013 May 9. PMID:23660960
This work provides key mechanistic insights which substantially extend the 2004 Blood article on HLH pathogenesis. **Citations:** 18 in the last 5 years
8. Johnson TS, Terrell CE, Millen SH, Katz JD, Hildeman DA, **Jordan MB**. Etoposide selectively ablates activated T cells to control the immunoregulatory disorder hemophagocytic lymphohistiocytosis. *J Immunol*. 2014 Jan 1;192(1):84-91. PMID:24259502
This work, conducted in my lab, provides the first mechanistic insights into how standard of care treatment (etoposide) controls the immune disorder HLH. **Citations:** 9 in the last 5 years
9. Carmo M, Risma KA, Arumugam P, Tiwari S, Hontz AE, Montiel-Equihua CA, Alonso-Ferrero ME, Blundell MP, Schambach A, Baum C, Malik P, Thrasher AJ, **Jordan MB***, Gaspar HB*. Perforin Gene Transfer Into Hematopoietic Stem Cells Improves Immune Dysregulation in Murine Models of Perforin Deficiency. *Mol Ther*. 2014 Dec 19. doi: 10.1038/mt.2014.242.
This work is the first report of pre-clinical correction of an immune regulatory disorder with lentiviral gene therapy. I conducted these studies in equal collaboration with Dr Gaspar's lab. **Citations:** 4 in 2015

10. Lo B, Zhang K, Lu W, Zheng L, Zhang Q, Kanellopoulou C, Zhang Y, Liu Z, Fritz JM, Marsh R, Husami A, Kissell D, Nortman S, Chaturvedi V, Haines H, Young LR, Mo J, Filipovich AH, Bleasing JJ, Mustillo P, Stephens M, Rueda CM, Chougnet CA, Hoebe K, McElwee J, Hughes JD, Karakoc-Aydiner E, Matthews HF, Price S, Su HC, Rao VK, Lenardo MJ, **Jordan MB**. AUTOIMMUNE DISEASE. Patients with LRBA deficiency show CTLA4 loss and immune dysregulation responsive to abatacept therapy. Science. 2015;349(6246):436-40. doi: 10.1126/science.aaa1663. PubMed PMID: 26206937.

This work has made a key contribution regarding how LRBA deficiency leads to immune dysregulation/ deficiency and how it may be treated. I made the clinical observations/ interventions underlying this work and conducted all laboratory studies in equal collaboration with the Lenardo lab. Citations: 22 in 10 months

paper#	2011	2012	2013	2014	2015	2016	total
1	11	17	16	9	9	2	147
2	22	24	15	20	25	10	232
3	8	6	7	4	4	2	39
4	2	7	10	18	12	4	60
5	3	15	42	63	61	17	202
6	N/A	N/A	6	14	10	3	33
7	N/A	N/A	1	7	7	3	18
8	N/A	N/A	N/A	3	6	0	9
9	N/A	N/A	N/A	N/A	3	1	4
10	N/A	N/A	N/A	N/A	10	12	22

Books:

“Histiocytic Disorders” (Chapter 50) M Jordan and A Filipovich, in Hematology, 6th edition, Hoffman et al (ed.) Elsevier, 2013

Distribution of effort:

Research and Scholarly activities: 75%

Clinical activities: 20%

Teaching /mentoring: 5%

I have reviewed the curriculum vita for completeness and accuracy and agree with its contents.

Michael B. Jordan