Curriculum Vitae (2025)

Derek W. Abbott, M.D., Ph.D.

Brief Objective and Qualifications: As a Board Certified Pathologist, my lab works at the intersection of Cell Biology, Genetics and Immunology. We seek to use genetic data to help map key nodal points in inflammatory and autoimmune disease and then use that knowledge to guide drug development. We currently have developed a drug targeting the kinase RIPK2, which entered Phase I human studies in February 2023, with indications being tested including ImmunoOncology and Inflammatory Bowel Disease. Additionally, we identified the first chemical inhibitor of pyroptosis, a form of inflammatory cell death and are utilizing Gasdermin D mRNA technology for immunooncology applications. Due to the extensive drug development focus of my laboratory, I've established a large network within the Pharmaceutical and Biotech industry. Beyond the lab's science and extensive university service, I've held key leadership positions including co-Director and Director of CWRU's Medical Scientist Training Program and am the current co-chair of the Burroughs Wellcome Career Award for Medical Scientists.

1. Education

B.A. 1993 (Highest Distinction – Summa Cum Laude equivalent)
University of Virginia, Charlottesville, VA
Major: Chemistry with a specialization in Biological Chemistry
Advisor: Robert F. Bryan, Ph.D.
Thesis Title: "Crystal Structures of Biologically Interesting Molecules: A 1:1 Deoxyadenosine : Triphenylphosphine Oxide Complex and a 1:2 d,l-trans-tetraplatin : Triphenylphosphine Oxide Complex"

Ph.D. 1998
Vanderbilt University School of Medicine, Nashville, TN
Field: Cell Biology
Dissertation Advisor: Jeffrey T. Holt, M.D.
Dissertation Title: "The Interplay of Genomic Instability and Transformation in Carcinogenesis"

M.D. 2000
Vanderbilt University School of Medicine, Nashville, TN

Certificate in "Emotionally Intelligent Leadership" 2023
Weatherhead School of Management, Case Western Reserve University, Cleveland, OH

2. Professional Appointments

2000-2003
Resident Physician in Pathology / Clinical Fellow in Pathology
Brigham and Women's Hospital, Harvard Medical School, Boston, MA

2002 - 2006
Post-Doctoral Fellow in the laboratory of Dr. Lewis Cantley
Department of Systems Biology
Harvard Medical School, Boston, MA
Project: "Signal transduction cascades underlying Innate Immunity"

2005 - 2006
Instructor in Pathology
Brigham and Women's Hospital, Boston, MA

2006 – 2013
Assistant Professor of Pathology
Case Western Reserve University Medical School, Cleveland, OH

2013 – 2017
Associate Professor of Pathology (with tenure)
Case Western Reserve University Medical School, Cleveland, OH

2015 – present
Arline H. and Curtis F. Garvin Professor of Medicine

2015 – 2016
Associate Director, Medical Scientist Training Program

2016-2019
Co-Director, Medical Scientist Training Program

2017- 2025
Professor of Pathology (with tenure)
Case Western Reserve University Medical School, Cleveland, OH

2019-2022
Director, Medical Scientist Training Program

2025-present
Professor and Chair, National Jewish Health
Department of Immunology and Genomic Medicine

Consulting Positions:

2011-2018. Novartis (Genomics Institute of the Novartis Research Foundation), San Diego, CA

2011-pres. Oncodesign, Inc., Dijon, France.

2014-2018. Idera Pharmaceuticals, Cambridge, MA

2018-2019. Atlas Ventures, Cambridge, MA

Scientific Advisory Boards

2014-2024. Scientific Advisory Board, Burroughs Wellcome Career Award for Medical Scientists (co-chair of committee from 2020-2024)

2015-2019. National Scientific Advisory Council, Crohn's and Colitis Foundation

2014-pres. Harrington Discovery Center, University Hospitals of Cleveland

2016-pres. Scientific Advisory Board, Oncodesign, Inc (Dijon, France)

3. Medical Board Certification

United State Medical Licensing Examination (USMLE)
Step 1: Passed June, 1995.
Step 2: Passed October, 1999.
Step 3: Passed February 2002.

Anatomic Pathology Board Certification:
Diplomat of the American Board of Pathology, July, 2003

4. Professional Society Memberships:

American Society for Microbiology, 2007 – present
American Society of Investigative Pathology, 2008-present
American Association for Immunology, 2010-present
Society for Leukocyte Biology, 2012-present
American Society of Biochemistry and Molecular Biology, 2016-present
American Society of Clinical Investigators (ASCI), 2016-present

5. Honors/Awards

1990 Echols Scholar, University of Virginia
1993 Merck Index Award for Chemistry, University of Virginia
1993 Phi Beta Kappa, University of Virginia
2000 John L. Shapiro Award for Excellence in Pathology, Vanderbilt University School of Medicine
2005 Rodger C. Haggitt Gastrointestinal Pathology Society Award. "Genetic Interactions and Histologic Associations of NOD2, DLG5, OCTN1 and OCTN2 Polymorphisms in Ileal Crohn's Disease," presented at USCAP Feb, 2005
2006 Burroughs Wellcome Career Award in the Biomedical Science
2009 CWRU Scholarship in Teaching Award (one of two basic scientists awarded in the entire medical school)
2011 Crain's Business Award – Advances in Health Care
2011 CWRU Scholarship in Teaching Award (one of two basic scientists awarded in the entire medical school)
2012 Dolph Adams Award (early-mid career investigator in Host Defense and Immunity), Society for Leukocyte Biology
2014 CWRU Scholarship in Teaching Award (one of two basic scientists awarded in the entire medical school)
2016 Elected to the American Society of Clinical Investigation (ASCI)
2016 Harrington Discovery Institute Fellow

6. Service

Editorial Service

2010 – 2014: Associate Editor, Journal of Immunology – 4 year term
2016 – 2026: Associate Editor, Journal of Biological Chemistry – 2 - 5 year terms

NIH Study Sections:

ZRG1 IMM-K (52) October 16, 2009 "RFA on Primary Immunodeficiencies"
ZAI1 BLG-M M2; March 17-18, 2010 "Enterics Research Investigational Network Cooperative Research Centers"
ZRG1 IMM-K (52) January 31, 2011 "RFA on Primary Immunodeficiencies
ZAI1 PA-1 (M2) May 11, 2011; "Abnormalities in B cell function" PPG Review

ZRG1 IMM-N (52) May 26, 2011 "Investigations on Primary Immunodeficiency Diseases"
ZRG1 IMM-N (52) September 2, 2011 "Investigations on Primary Immunodeficiency Diseases"
ZRG1 IMM-N (52) February 2, 2013 "Investigations on Primary Immunodeficiency Diseases"
VA study section IMMA "Immunology" June 12, 2013
ZAI1 PA-I (J1) November 17-19, 2013 "Autoimmune Centers of Excellence"
VA study section IMMA "Immunology" Dec. 3, 2013
ZRG1 IMM-N (52), March 6-7, 2014, "Investigations on Primary Immunodeficiency Diseases"
ZRG1 IMM-N (52), June 10, 2014, "Investigations on Primary Immunodeficiency Diseases"
ZRG1 F07-J-20, October 21, 2014, "Fellowships in Immunology"
ZRG1-IMM-J-81, October 22, 2014, "R15 grants in Immunology"
ZRG1 IMM-R (90), December 18, 2014, "Immunology Res. Special Emphasis Panel"
ZRG1 IDM-W (91), January 7, 2015, "Immunology Res. Special Emphasis Panel"
ZRG1 IMM-K (52), March 3, 2015, "Investigations on Primary Immunodeficiencies"
ZRG1 IMM-K (52), June 11, 2015, "Investigations on Primary Immunodeficiencies"
ZRG1 IMM-K (52), October 15, 2015, Investigations on Primary Immunodeficiencies"
ZAI1-PA-I-M3, January 22, 2016, "Abnormalities in B cell function" PPG review
ZRG1-IMM-K-52, March 2, 2017, "Investigations in Primary Immunodeficiencies"
ZRG1-IMM-K-52, June 13, 2017, "Investigations in Primary Immunodeficiencies"
ZRG1-DKUS-R-06, June 26, 2017, Special Emphasis Panel – Chair
ZRG1-DKUS-M-05, July 12, 2017, "GI Physiology and Pathology"
ZRG1-DKUS-N-10, March 7, 2018, "SBIR – Gastroenterology"
ZRG1-IMM-K-52, October 23, 2018, "Investigations on Primary Immunodeficiencies"
ZRG1-IDM-V-02, March 14, 2019, "Topics in Bacterial Pathogenesis and Virulence"
NIH GPMB, June 27, 2019, "Gastrointestinal Pathology and Mucosal Biology"
ZRG1-IMM-K-52, October 31, 2019, "Investigations in Primary Immunodeficiencies"
NIH IHD, June 24-25, 2020, "Immunity and Host Defense"
ZRG-IMM-T57, October 29-30, 2020, "Hypersensitivity, Allergy & Mucosal Immunology"
PRMRP – Department of Defense, August 8-9, 2023, "Mitochondrial Diseae"

International Grant Review

Italian Ministry of Health: Study Section for "Competition for Targeted Research Funding", August, 2010
National Medical Research Council (Singapore, Singapore): "Infection and Inflammation", January 26, 2011
French National Research Agency (Paris, France): "Microbiology, Infection and Inflammation" February 8. 2012
European Research Council, Advanced Grant Call, 2015; Brussels, Belgium
Scientific Review of MRC Human Immunology Unit at the University of Oxford (HIU), 2016, Cambridge, UK
Irish Research Council Advanced Laureate Awards – 2023
Swiss National Science Foundation - 2023

Local Service

2006-2010 Director of Pathology Research Seminar Series
(responsible for the invitation, itineraries and travel arrangements for 15 outside speakers per year and 18 internal speakers per year)

2006-2011 Judge, Biomedical Graduate Student Symposium Poster Judge, CWRU
(2006, 2007, 2008, 2009, 2010, 2011)

2009-pres. Planning Committee – Lepow Day

2010-2011 Search Committee, Director of Clinical Pathology

2011-2012 Search Committee, Director for the Center for Immunology

2011-pres. Steering Committee, Medical Scientist Training Program

2011-2012 Dean's Ad-hoc Committee on Faculty Compensation

2012-pres. Steering Committee – Cellular and Molecular Biology Training Grant

2012-2015. Chair, Search Committee, Assistant/Associate Prof. Immunology

2012-2015. Finance Committee, School of Medicine

2014-2015. Ratnoff Chair Search Committee

2014-2105 Cancer Center Faculty Search Committee

2015-pres. Search Committee – Immunology Faculty

2014-pres. Faculty advisory panel – UH/CWRU affiliation agreement

2015-pres. UH/CWRU Physician Scientist Committee

2015-pres. Harrington Discovery Center, Investigator Review panel

2015-2016. Associate Director, Medical Scientist Training Program

2016-2019 Co-Director, Medical Scientist Training Program

2016-2017. Search Committee, University Hospitals of Cleveland - Chairman of Medicine

2019-2022. Director, Medical Scientist Training Program

7. Selected National Presentations/Lectures

December 6, 2004;	Grand Rounds, Department of Pathology, Vanderbilt University School of Medicine, Nashville TN
January 20, 2005:	Grand Rounds, Department of Pathology, University of Colorado Health Sciences Center, Denver, CO
February 22, 2005:	Pathology Research Seminar, Dartmouth Hitchcock Medical Center, Dartmouth Medical School, Hanover, NH
May 26, 2005;	Research Seminar, Center for the Study of Inflammatory Bowel Disease, Massachusetts General Hospital, Boston, MA
August 5, 2005:	Research Seminar, Genentech, South San Francisco, CA
September 12, 2005	Research Seminar, University of California San Diego, San Diego, CA
September 22, 2005	Research Seminar, Case Western Reserve University, Cleveland, OH
October 26, 2005	Research Seminar, U. of California Los Angeles, Los Angeles, CA
December 3, 2005	Research Seminar, U. of California, San Francisco, San Francisco, CA
January 10, 2006	Research Seminar, Atlantic Digestive Diseases Conference, Wintergreen, VA
November 26, 2007	Research Seminar, College of Wooster, Wooster, OH
December 9, 2008	Pathology Grand Rounds, University of Virginia, Charlottesville, VA
September 10, 2009	Immunology Research Seminar Series, Wadsworth Institute, Albany, NY
March 8, 2010	Symposium speaker, AAAS "Personalized Medicine in the Clinic" conference, Arizona State University, Phoenix, AZ
April 5, 2010	Biology Research Seminar Series, University of South Carolina, Columbia, SC
July 20, 2010	Research Seminar, GlaxoSmithKline, Philadelphia, PA

October 23, 2010	ASBMB Special Meeting: "Post-translation modifications: Detection and Physiologic Evaluation," Tahoe City, CA
March 8, 2011	Department of Pathobiology Research Seminar Series, Cleveland Clinic Foundation, Cleveland, OH
March 22, 2011	CWRU Department of Pharmacology Research Seminar Series, Cleveland, OH
March 31, 2011	Department of Biology Research Seminar Series, John Carroll University, University Heights, OH
May 15, 2011	Co-Chair, AAI symposium on Inflammasome Function, San Francisco, CA
July 13, 2011	Research Seminar, Ubiquitin Drug Discover and Development Conference, Philadelphia, PA
July 29, 2011	Research Seminar, Novartis Institute for Genomic Medicine, San Diego, CA
October 21, 2011	Symposium Speaker, Fox Chase Cancer Center Symposium on Inflammation, Philadelphia, PA
August 3, 2012	Research Seminar, Boerhinger-Ingelheim, Danbury, CT
October 28, 2012	Dolph Adams Award Lecture, Society for Leukocyte Biology Annual Meeting, Maui, HI
October 3, 2013	Research Seminar, Genentech, South San Francisco, CA
February 20, 2014	Research Seminar, Van Andel Research Institute, Grand Rapids, MI
July 16, 2014	Research Seminar, Baylor College of Medicine, Houston, TX
October 2, 2015	Toll Meeting, Marbella, Spain (2 presentations)
February 3, 2016	Research Seminar, Yale University School of Medicine, New Haven, CT
November 15, 2016	Research Seminar, Johns Hopkins Medical School, Baltimore, MD
December 7, 2018	Research Seminar, Abbvie, Chicago, IL
March 19, 2019	Research Seminar, Jackson Laboratory, Storrs CT
Sept 19, 2020	Research Seminar, NIH (virtual)
March 22, 2022	Research Seminar, The University of Virginia, Charlottesville, VA
March 29, 2022	Research Seminar, Beth Israel Deaconess, Harvard Medical School
April 27, 2023	Moonshot Moderator, National Cancer Institute, Bethesda, MD
Feb 1, 2024	Research Seminar, National Jewish Hospital, Denver CO
Feb 5, 2024	Research Seminar, University of Pennsylvania, Philadelphia, PA

8. Teaching

Graduate Student Committees:

Reginald Gray, Ph.D Thesis Committee, graduation July, 2007
Jeffrey Meisch, MS Thesis Committee, graduation February, 2010
Elizabeth Rodkey, Qualifying Examination Committee, March, 2010
Gabriel Zentner, Ph.D. Thesis Committee, graduation October, 2011
Elizabeth Johnson, Ph.D. Thesis Committee, graduation August, 2014
Yi Liu, Ph.D. Thesis Committee, graduation July, 2011
Jeffrey Tomolka, Ph.D. Thesis Committee, graduation, June, 2013
Ling Wu, Ph.D. Thesis Committee, graduation June, 2014
Stephen De Jesus Carrion, PhD. Thesis Committee, graduation November, 2014
Chairut Vareechon, Ph.D., Thesis Committee, graduation March 2015
James Morrow, Chair, Thesis Committee, graduation May, 2016
Claire Mazahery, Chair, Thesis Committee, MSTP student, graduation May 2019
Avery Sears, Thesis committee, MSTP student, graduation October, 2020
Megan Zangara, Thesis committee, CCF Mol Medicine student, graduation Nov, 2021
Sarah Venus, Thesis Committee, MSTP student
Brendan Boylan, Thesis Committee, MSTP student
Katrina Piemonte, Thesis Committee, MSTP student
Zachary Grimmett, Thesis Committee, MSTP student

Student Adviser for:

Jill Marinis, graduate student – defended dissertation March 23, 2012
(note: recipient of 2012 Doctoral Award of Excellence – Pathology
joined the lab or Mitchell Lazar, UPENN as a post-doctoral fellow, currently an Investigator at GlaxoSmithKline)
Jennifer Soo Hoo, undergraduate – currently a resident in medicine
Jessica Perez, Ph.D. Graduation October, 2017
Steven Chirielson, MSTP student, Ph.D. Graduation, May 2017
Joseph Rathkey, MSTP student, Ph.D. Graduation May 2018
Bowen Zhou, MSTP student, Ph.D. Graduation July 2020
Hannah Kondolf,current MSTP student
Meghan O'Keefe, current MSTP student
Michelle Pan, current MSTP student

Post-Doctoral Adviser for:

Justine Tigno-Aranjuez, Ph.D. (currently Assistant Professor, University of Central Florida)
Christopher Ryder, M.D., Ph.D. (currently Assistant Professor, Moffitt Cancer Center)
Douglas Hartmann, M.D. **(**currently Asst Prof. of Pathology, University of Pittsburgh)

Rotation Students (didn't join lab):

Peter Levitt, MSTP student, Fall, 2007
Nile Chang, MSTP student, Spring 2008
Joseph Mudd, BSTP student, Summer 2009
Courtney Niland, BSTP student, Summer 2010
James Sears, BSTP student, Summer 2010
Nick Ventimiglia, BSTP student, Fall 2010
Kyle Scarberry, MSTP student, Fall, 2010
Chairut Vareechon, BSTP student, Fall 2011
Michelle Cruz, MSTP student, Summer, 2016
Otis Pickard, MSTP student, Fall, 2016
Kevin Newhall, MSTP student, Fall 2020
Jessica Sirek, BSTP student, Summer 2022
Eveliz Peguero Pierra, BSTP student, Fall 2022

Course Teaching:

Course co-director: Path 480 "Logical Dissection of Biomedical Investigation", a graduate school course investigating the logic behind experimental design, publication and grant applications, Taught every 4 semesters
Course Director, MSTP 601: "Introduction to Biomedical Science"
A 3 credit course taught in the Summer to incoming MSTP students.

Awards for Teaching:

2009 CWRU Scholarship in Teaching Award (one of two basic scientists awarded in the entire medical school) for co-directing Path480 "Logical Dissection of Biomedical Investigation"

2011 CWRU Scholarship in Teaching Award (one of two basic scientists awarded in the entire medical school) for co-directing Path480 "Logical Dissection of Biomedical Investigation"

2014 CWRU Scholarship in Teaching Award (one of two basic scientists awarded in the entire medical school) Path480 "Logical Dissection of Biomedical Investigation"

9. Research Support (Extramural)

2020-pres R35GM141602
"Innate Immune Signal Transduction Specificity in Inflammatory Disease"
National Institute of General Medical Sciences
Yearly Costs: $250,000 + 60% indirect costs
Role: Principal Investigator (6.12 calendar months)

2020-pres P01 AI41350
"Cellular Engineering to identify Gasdermin protein networks regulating inflammatory cell death"
National Institute of Allergy and Infectious Disease
Yearly Costs: $265,725 direct costs + 60% indirect costs per year
Role: Principal Investigator (3 Calendar Months)

Completed

1990-1993 Howard Hughes Undergraduate Research Fellowship
Total Funding = $18,000 over three years

1993-2000 National Institutes of Health – Medical Scientist Training Fellowship
Total Funding = $123,000 over 7 years

2003-2004 Center for Inflammatory Bowel Diseases
Massachusetts General Hospital
"RIP2 kinase activity in Crohn's Disease"
Total Funding: $17000 over 1 year

2004-2008. K08 Clinical Scientist Mentored Development Award
National Institutes of Allergy and Infectious Disease
K08 AI 53819-01
Total direct costs = $509,780 over 4 years

2006-2014 Burroughs Wellcome Career Award in the Biomedical Sciences
"Regulation of Innate Immunity via non-traditional ubiquitin linkages"
Total Funding = $500,000 over 5 years ($100,000 per year)
Role: Principal Investigator

2008-2011 R21AI076886
"Feedback regulation of innate immune signaling at mucosal surfaces"
National Institutes of Allergy and Infectious Disease
Total costs = $275,000 over 2 years + 57% indirect costs
July 1, 2008 – June 30, 2011
Role: Principal Investigator

2008-2011 R03AI0779766
"IRAK4 kinase activity's role in Immunodeficiency
National Institutes of Allergy and Infectious Disease
Total Costs = $100,000 over 2 years + 57% indirect costs
August 1, 2008 – July 31, 2011
Role: Principal Investigator

2010-2011 R01GM86550-01S1
"Innate immune signal transduction specificity in inflammatory disease"
National Institute of General Medical Sciences
Total costs: $71,000 direct costs (equipment grant)
September 1, 2010 – August 31, 2011
Role: Principal Investigator

2011-2014 R21AI091637
"The Role of NEMO Ubiquitination in EDA-ID"
National Institutes of Allergy and Infectious Disease
Total Costs = $275,000 direct costs over 2 years + 57% indirect costs
Role: Principal Investigator

2016 R01-GM86550-08S1 – one year equipment supplement
"Innate immune signal transduction specificity in inflammatory disease"
National Institute of General Medical Sciences
Yearly costs: $81,000 for a Molecular Devices Spectramax i3x
Role: Principal Investigator

2015-2018 R21 DE025825
"Glycome-Enhanced KnockOut (GEKO) Technology"
National Institute of Dental and Craniofacial Research
Yearly Costs: $194,000 + 58.5% indirect costs per year
Role: Principal Investigator (1.5 calendar months)
Note: Multi PI grant with Brian Cobb, Ph.D. as other PI

2015-2018. Oncodesign, Inc. Sponsored Project Award (Dijon, France)
Yearly costs: $40,000 + 58.5% indirect costs per year

2017-2020 Harrington Fellows Award
Harrington Discovery Center
Yearly costs: $75,000 direct
Role: Principal Investigator

2008-2021 R01 GM86550
"Innate immune signal transduction specificity in inflammatory disease"
National Institute of General Medical Sciences
Yearly costs: $205,000 direct costs + 60% indirect costs per year
Role: Principal Investigator (3 calendar months)

2019-2022 T32 GM007250
"Medical Scientist Training Program"
National Institute of General Medical Sciences
Yearly Costs: $1,459,164 direct costs + $68,013 indirect costs per year
Role: Principal Investigator (2.5 calendar months)

2011-2022 P01 DK091222
"Innate Immunity and experimental Crohn's disease"
National Institutes of Diabetes and Digestive and Kidney Disease
Yearly costs = $205,000 direct costs + 60% indirect costs per year
Role: Principal Investigator Project 2 (3 calendar months)

10. Bibliography

Abstracts (a list of dfabstracts from society meetings and other events resulting from investigator-initiated submission is available upon request)

Publications

Abbott, D.W. and J.T. Holt. (1997) "Finkel-Biskis-Reilly mouse osteosarcoma virus v-fos inhibits the cellular response to ionizing radiation in a myristoylation-dependent manner." *Journal of Biological Chemistry*. **272**:14005-8.

Abbott, D.W. and J.T. Holt. (1997) "Finkel-Biskis-Reilly osteosarcoma virus v-Fos inhibits adipogenesis and both the activity and expression of CCAAT/enhancer binding protein alpha, a key regulator of adipocyte differentiation."*Journal of Biological Chemistry*. **272**:32454-62.

Abbott, D.W., Freeman, M.L., and J.T. Holt (1998) "Double-strand break repair deficiency and radiation sensitivity in BRCA2 mutant cancer cells." *Journal of the National Cancer Institute*. **90**:978-85.

Abbott D.W. and J.T. Holt. (1999) "Mitogen-activated protein kinase kinase 2 activation is essential for progression through the G_2/M checkpoint arrest in cells exposed to ionizing radiation." *Journal of Biological Chemistry*. **274**:2732-42.

Abbott, D.W., Thompson, M.E., Robinson-Benion, C., Tomlinson, G., Jensen, R.A., and J.T. Holt. (1999) "BRCA1 expression restores radiation resistance in BRCA1-defective cancer cells through enhancement of transcription-coupled DNA repair." *Journal of Biological Chemistry*. **274**:18808-12.

Crum, C.P., **Abbott, D.W**. and B. Quade. (2003). "Cervical cancer screening: from the papanicolaou smear to the vaccine era." *J. Clinical Oncology*. 21(10 Suppl):224-30.

Hutti, J.E., Jarrell, E.T., Chang, J.D., **Abbott, D.W**., Storz, P.E., Toker, A., Cantley, L.C., and B.E. Turk. (2004). "A rapid method for determining protein kinase phosphorylation specificity." *Nature Methods*. **1**:27-29.

Abbott, D.W., Wilkins, A., Asara, J.M., and L.C. Cantley. (2004). "The Crohn's Disease gene, NOD2, induces the ubiquitinylation of NEMO at a novel site." *Current Biology*, **14**: 2217-2227. ("News and Views" discussing paper, *Current Biology*, 14: R1040-R1042.; Faculty of 1000 citation: "Must Read"; paper selected in Research Highlights at both *Nature Immunology* and *Nature Reviews Immunology*, Feb. 2005)

Kang, C., **Abbott, D.W.**, Cantley, L.C. and R. Husson. (2005) "The *Mycobacterium tuberculosis* serine/threonine kinases PknA and PknB: substrate identification and regulation of cell shape" *Genes and Development*. **19**: 1692-1704.

Manning, B.D., Logsdon, M.N., Lipovsky, A.I., **Abbott, D.W**., Kwiatkowski, D.J. and L.C. Cantley. (2005). "Feedback inhibition of Akt signaling limits the growth of tumors lacking *Tsc2." Genes and Development"*. **19**: 1773-1778.

Abbott, D.W. and D.B. Polk. (2005) "NODing off and ramping up." *Inflammatory Bowel Diseases*. *11*: 860-861.

Abbott, D.W.*, Yang, Y., Hutti, J.E., Madhavarapu, S., Kelliher, M.A. and L.C. Cantley. (2007) "Coordinated regulation of Toll-like Receptor and NOD2 signaling by K63-linked polyubiquitin chains." *Molecular and Cellular Biology.* **27**: 6012-6025. *corresponding author

Hutti, J.E., Turk, B.E., Asara, J.M., Ma., A., Cantley, L.C. and **D.W. Abbott*** (2007) "IkappaB kinase beta phosphorylates the K63 deubiquitinase A20 to cause feedback inhibition of the NF-kappaB pathway." *Molecular and Cellular Biology*. **27**: 7451-7461. *corresponding author

Yang, Y., Yin, C., Pandey, A., **Abbott, D**., Sassetti, C. and M.A. Kelliher. (2007)

"NOD2 Pathway Activation by MDP or Mycobacterium tuberculosis Infection Involves the Stable Polyubiquitination of Rip2." *J Biol Chem*. **282**: 36223-36229.

Xiao, H., Li, X. and **D.W. Abbott*** (2008) "Analysis of TLR expression, regulation and signaling." Signaling by Toll-like Receptors. Taylor and Francis Publishing Group. *corresponding author

Degterev, A., Hitomi, J., Germsheid, M., Ch'en, I., Korkina, O., Teng, X., **Abbott, D**., Cuny, G.D., Uyan, C., Wagner, G., Hedrick, G.M., Gerber, S.A., Lugovskoy, A. and J. Yuan. (2008) "Identification of RIP1 kinase as a cellular target of necrostatins." *Nature Chemical Biology*, **4**: 313-21.

Clark, N.M., Marinis, J.M., Cobb, B.A. and **D.W. Abbott***. (2008) "MEKK4 sequesters RIP2 to dictate NOD2 signal specificity." *Current Biology*. **18**: 1402-8. *corresponding author

Hutti, J.E., Shen, R.R., **Abbott, D.W**., Zhou, A.Y., Sprott, K.M., Asara, J.M., Hahn, W.C. and L.C. Cantley. (2009) "Phosphorylation of the tumor suppressor CYLD by the breast cancer oncogene IKKepsilon promotes cell transformation." *Molecular Cell*. **34**: 461-72.

Tao, M., Scacheri, P.C. Marinis, J.M., Harhaj, E.W., Scacheri, P.S., Matesic, L.M. and **D.W. Abbott*** (2009) "ITCH K63-ubiquitinates the NOD2-binding protein, RIP2, to influence inflammatory signaling pathways." *Current Biology*. **19**:1255-1263. *corresponding author

Li, C., Yu, S., Fumihhiko, N., Yin, S., Xi, J., Petrolla, A.A., Singh, N., Tartakoff, A., **Abbott, D.W**., Xin, W. and M. Sy. (2009) Binding of pro-prion to filamin A disrupts cytoskeleton and corr-elates with poor prognosis in pancreatic cancer. *Journal of Clinical Investigation* **119**:2725-36.

Liu, Y.C, Gray, R.C., Hardy, G.A., Kuchtey, J., **Abbott, D.W.**, Emancipator, S.N. and C.V. Harding. (2010) CpG-B Oligodeoxynucleotides Inhibit TLR-Dependent and -Independent Induction of Type I IFN in Dendritic Cells. *J. Immunology*, **184**: 3367-76

Gorfu, G, Rivera-Nieves, J., Hoang, S., **Abbott, D.W.**, Pizarro, T.T., Cominelli, F., McDuffie, M. and K. Ley. (2009) "B7 integrin deficiency suppresses B cell homing and progression of chronic ileitis in SAMP1/YitFc mice." *J. Immunology*, **185**: 5561-8.

Tigno-Aranjuez, J.T., Asara, J.M. and **D.W. Abbott.*** (2010) "Inhibition of RIP2's tyrosine kinase activity limits NOD2-driven cytokine responses." *Genes and Development*. **24**:2666-77. *corresponding author

Marinis, J.M., Homer, C., McDonald, C.M. and **D.W. Abbott.*** (2011) "A novel motif in the Crohn's disease susceptibility protein, NOD2, allows TRAF4 to down-regulate innate immune responses." *Journal of Biological Chemistry*. **286**:1938-1950. *corresponding author

Shembade, N., Pujari, R., Harhaj, N.S., **Abbott, D.W**. and E.W. Harhaj. (2011) "The kinase IKKa inhibits activation of the transcription factor NF-kB by phosphorylating the regulatory molecule TAX1BP1" *Nature Immunology*, **12**:834-43.

Liu, Y.C., Simmons, D.P., Li, X., **Abbott, D.W.**, Boom, W.H. and C.V. Harding. (2012) "TLR2 signaling depletes IRAK1 and inhibits induction of type I IFN by TLR7/9. *J Immunol*. **288**:1019-26.

Tigno-Aranjuez, J.T. and **D.W. Abbott***. (2012) "Ubiquitination and Phosphorylation in the Regulation of NOD2 signaling and NOD2-mediated Disease." *Biochem and Biophys Acta*. 1823:2022-8. *corresponding author

Marinis, J.M., Hutti, J.E., Homer, C., Cobb, B.A., Cantley, L.C., McDonald, C. and **D.W. Abbott.*** (2012) "IKKα Phosphorylation of TRAF4 downregulates innate immune signaling." *Molecular and Cellular Biology* **32**:2479-89.*corresponding author

Roget, K., Ben-Addi, A., Mambole-Dema, A., Gantke, T., Yang, H.T., Janzen, J., Morrice, N., **Abbott, D.** and S.C. Ley. (2012) IKK2 regulates TPL-2 activation of ERK-1/2 MAP kinases by direct phosphorylation of TPL-2 serine 400. *Molecular and Cellular Biology*. **32**:4684-90.

Tigno-Aranjuez, J.T., Bai, X. and **D.W. Abbott*.** (2013) "A discrete ubiquitin-mediated network regulates the strength of NOD2 signaling." *Molecular and Cellular Biology*. **33**:146-158. *corresponding author

Jun, J.C., Cominelli, F and **D.W. Abbott*** (2013) RIP2 activity in inflammatory disease and implications for novel therapeutics. *Journal of Leukocyte Biology*. **94**:927-32.*corresponding author

Jun, J.C., Kertesy, S., Jones, M.B., Marinis, J.M., Cobb, B.A., Tigno-Aranjuez, J.T. and **D.W. Abbott***. (2013) Innate immune-directed NF-κB signaling requires site-specific NEMO ubiquitination. *Cell Reports*, **4**:352-361, *corresponding author

Corridoni, D., Kodani, T. Rodriguez-Palacios, A., Pizarro, T.T., Xin, W., Nickerson, K.P., McDonald, C., Ley, K.F., **Abbott, D.W.** and F. Cominelli. (2013) Dysregulated NOD2 predisposes SAMP1/YitFc mice to chronic intestinal inflammation. *PNAS*. **110**: 16999-7004.

Ryan, S.O, Leal, S.M. Jr., **Abbott, D.W.**, Pearlman, E. and B.A. Cobb. (2014) Mgat2 ablation in the myeloid lineage leads to defective glycoantigen T cell responses. *Glycobiology*. **24**: 262-271.

Ryan, S.O., **Abbott, D.W.** and B.A. Cobb. (2014) Myeloid glycosylation defects lead to a spontaneous common variable immunodeficiency-like condition with associated hemolytic anemia and antilymphocyte autoimmunity. *J. Immunology*. **192**: 5561-5570.

Tigno-Aranjuez, J.T., Benderitter, P., Rombouts,F., Deroose, F., Bai, X., Mattioli, B., Cominelli, F., Pizarro, T.T., Hoflack, J., and **D.W. Abbott*** (2014) "In vivo inhibition of RIPK2 kinase alleviates inflammatory disease." *J. Biol. Chem*., **289**: 29651-29654. *corresponding author

Perez, J.M., Chirieleison, S.M. and **D.W. Abbott*** (2015) "An I Kappa Kinase-regulated feed-forward circuit prolongs inflammation." *Cell Reports*, **12**:537-544 *corresponding author

De Salvo, C., Wang, X.M., Pastorelli, L., Mattioli, B., Omenetti, S., Buela, K.A., Chowdhry, S., Garg, R.R., Goodman, W.A., Rodriguez-Palacios, A., Smith, D.E., **Abbott, D.W**., Cominelli, F., Bamias, G., Xin, W., Lee, J.J., Vecchi, M. and T.T. Pizarro. (2016) "IL-33 drives eosinophil infiltration and pathogenic type 2 helpter T-cell Immune responses leading to chronic experimental ileitis". *American Journal of Pathology*. **186**:885-98.

Chirieleison, S.M., Kertesy, S.B. and **D.W. Abbott*** (2016) "Synthetic Biology Reveals the Uniqueness of the RIP Kinase Domain". *Journal of Immunology,* **96**:4291-7*.* *corresponding author

Petrosiute, A., Dorand, R.D., Nthale, J., Myers, J.T., Barkauskas, D.S., Chirieleison, S.M.,Pareek, T., **Abbott, D.W.**, Stearns, D.S., Letterio, J.J., and A.Y. Huang. (2016) "Cdk5 Disruption Attenuates Tumor PD-L1 Response to IFNγ Leading to CD4+ T-cell Mediated Rejection" *Science*, 53: 399-403.

Russo, H, Rathkey, J., Boyd-Tressler, A., Katsnelson, M.A., **Abbott, D.W.** and G.R. Dubyak. (2016) "Active caspase-1 induces gasdermin D-dependent plasma membrane pores that are blocked by lanthanides", *Journal of Immunology,* **197**: 1353-67*.*

Chirieleison, S.M., Marsh, R., Kumar, P., Rathkey, J.K., Dubyak, G.R. and **D.W. Abbott***. (2017) XLP-2 and IBD-associated mutations of xIAP lower the threshold for inflammatory cell death. *Journal of Biological Chemistry*. **292**:9666-9679. *corresponding author

Rathkey, J.K., Benson, B.L, Chirieleison, S.M., Yang, J., Xiao, T.S., Dubyak, G.R., Huang, A.Y. and **D.W. Abbott***. (2017) Live-cell visualization of gasdermin D-driven pyroptotic cell death. *Journal of Biological Chemistry*. **292**:14649-14658. *corresponding author

Perez, J.M., Chen, Y. Xiao, T.S. and **D.W. Abbott*** (2018) "Phosphorylation of ITCH diminishes binding to its cognate E2 ubiquitin ligase." *Journal of Biological Chemistry*, **293**:1100-1105.*corresponding author

Dziedzic, S.A., Su, Z., Najafov, A., Amin, P., Pan, H., Sun, L., Zhu, H., **Abbott, D.W.** and J. Yuan. (2018) "ABIN-1 Regulates RIPK1 Activation by Controlling Its Ubiquitination in TNFR1 Signaling." *Nature Cell Biology,* **20**:58-68.

Liu, Z, Wang, C., Rathkey, J.K., Yang, J., Dubyak, G.R., **Abbott, D.W.** and T.S. Xiao. (2018) Structures of the Gasdermin D C-Terminal Domains Reveal Mechanisms of Autoinhibition. *Structure*. 26: 778-84.

Yang, J., Liu, Z., Want, C., Yang, R., Rathkey, J.K. Shi, W., Dubyak, G.R., **Abbott, D.W.**, and T.S. Xiao. (2018) "Mechanism of gasdermin D recognition by inflammatory caspases and their 2 inhibition by a gasdermin D-derived peptide inhibitor." *PNAS*, **115**:6792-6797.

Chirieleison, S.M., Rathkey, J.R. and **D.W. Abbott***. (2018) "Unique BIR domain sets dictate IAP-driven cell-death and NOD2 signal specificity." *Science Signaling*. 11(539). pii: eaao3964 *corresponding author

Rathkey, J.K, Zhou, J. Luo, Z., Chen, Y., Yang, J., Kondolf, H.C., Benson, B.L., Chirieleison, S.M., Huang, A.Y., Dubyak, G.R., Xiao, T.S., Li, X. and **D.W. Abbott***. (2018) "Chemical disruption of the pyroptotic pore forming protein, Gasdermin D, inhibits inflammatory cell death and sepsis." *Science Immunology*. 3(26). pii: eaat2738 *corresponding author

Lopetuso, L.R., De Salvo, C., Pastorelli, L., Rana, N., Senkor, H.N., Petito, V., Di Martino, L., Scaldaferri, F., Gasbarrini, A., Cominelli, F., **Abbott, D.W.**, Goodman, W.A. and T.T. Pizarro. (2018) "IL-33 promotes recovery from acute colitis by inducing miR-320 to stimulate epithelial restitution and repair." *PNAS*, **115**: E9362-E9370

Liu, X., Taftaf, R., Kawaguchi, M., Chang, Y.F., Chen, W., Entenberg, D., Zhang, Y., Gerratana, L., Huang, S., Patel, D.B., Tsui, E., Adorno-Cruz, V., Chirieleison, S.M., Cao, Y., Harney, A.S., Patel, S., Patsialou, A., Shen, Y., Avril, S., Gilmore, H.L., Lathia, J.D., **Abbott, D.W.**, Cristofanilli, M., Condeelis, J.S. and H. Liu. (2019) "Homophilic CD44 interactions mediate tumor cell aggregation and polyclonal metastasis in patient-derived breast cancer models. *Cancer Discovery*. **9**: 96-113."

Zhang, C.J., Jiang, M., Zhou, H., Liu, W., Wang, C., Kang, Z., Han, B., Zhang, Q., Chen, X., Xiao, J., Fisher, A., Kaiser, W.J., Murayama, M.A., Iwakura, Y., Gao, J., Carman, J., Dongre, A., Dubyak, G., **Abbott, D.W.**, Shi, F.D., Ransohoff, R.M. and X. Li (2019) "TLR-stimulated IRAKM activates caspase-8 inflammasome in microglia and promotes neuroinflammation." *J. Clinical Investigation*, **128**: 5399-5412

Zammit ,N.W., Siggs, O.M., Gray, P.E., Horikawa, K., Langley, D.B., …**Abbott, D.W**., …, Teo, J., Tangye, S.G., King, C., Wong, M., Cox, M.P., Phung, W., Tang, J., Sandoval, W., Wertz, I.E., Christ, D., Goodnow, C.C., and S.T. Grey. (2019) "Denisovan, modern human and mouse TNFAIP3 alleles tune A20 phosphorylation and Immunity." *Nature Immunology* **20**: 1299-1310.

Liu, Z., Wang, C., Yang, J., Zhou, B., Yang, R., Ramachandran, R., **Abbott, D.W.** and T.S. Xiao. (2019) "Crystal structures of full-length murine and human gasdermin D reveal mechanisms of autoinhibition, lipid-binding and oligomerization." *Immunity*, **51**: 43-49

Rathkey, J.K., Xiao, T.S., and **D.W. Abbott***. (2020) "Human polymorphisms in Gsdmd alter the inflammatory response." *J. Biol. Chem*. Epub Jan 27, 2020 doi: 10.1074/jbc.RA119.010604. * corresponding author

Gao, X.H., Li, L., Parisien, M., Wu, J., Bederman, I., Gao, Z., Krokowski, D., Chirieleison, S.M., **Abbott, D.**, Wang, B., Arvan, P., Cameron, M., Chance, M., Willard, B. and M. Hatzoglou M. (2020) "Discovery of a redox thiol switch: Implications for cellular energy metabolism. *Molecular and Cellular Proteomics*. **19**: 852-870.

Karmakar, M., Minns, M., Greenberg, E.N., Diaz-Aponte, J., Pestonjamasp, K., Johnson, J.L., Rathkey, J.K., **Abbott, D.W.**, Wang, K., Shao, F., Catz, S.D., Dubyak, G.R. and E. Pearlman. (2020) "N-GSDMD trafficking to neutrophil organelles facilitates IL-1b release independently of plasma membrane pores and pyroptosis." *Nature Communications*. **11**:2212.

Liu, Z., Wang, C., Yang, J., Chen, Y., Zhou, B., **Abbott, D.W.** and T.S. Xiao. (2020) "Caspase-1 engages full-length Gasdermin D through two distinct interfaces that mediate Caspase recruitment and substrate cleavage." *Immunity*. **53**:106-114.

Zhou, B. and **D.W. Abbott***. (2021) "Gasdermin E permits IL-1B release in distinct sublytic and pyroptotic phases." *Cell Reports*. **35**:108998. *corresponding author

Ryder, C.B., Kondolf, H.C., O'Keefe, M.E., Zhou, B. and **D.W. Abbott*.** (2022) "Chemical modulation of Gasdermin-mediated pyroptosis and therapeutic potential." *Journal of Molecular Biology*. **434**:167183. doi: 10.1016/j.jmb.2021.167183. *corresponding author

Rana, N., Privitera, G., Kondolf, H.C., Bulek, K., Lechuga, S., De Salvo, C., Corridoni, D., Antanaviciute, A., Maywald, R.L., Hurtado, A.M., Zhao, J., Huang, E., Li, X., Chan, E.R., Simmons, A., Barnias, G., **Abbott, D.W.**, Heaney, J.D., Ivanov, A.I. and Pizarro, T.T. (2022) "Non-pyroptotic GSDMB regulates epithelial restitution and repair and is increased in IBD." *Cell*. **185**:283-298.

Zhang, Q., Liu, W., Wang, H., Zhou, H., Bulek, K., Chen, X., Zhang, C.J., Zhao, J., Zhang, R., Liu, C., Kang, Z., Bermel, R.A., Dubyak, G., **Abbott, D.W.**, Xiao, T.S, Nagy, L.E. and X. Li. (2022) "Th17 cells promote CNS inflammation by sensing danger signals via Mincle." *Nature Communications*, **13**:2406. doi: 10.1038/s41467-022-30174-1.

Zhou, B., Ryder, C.R. Dubyak, G.R. and **D.W. Abbott***. (2022) "Gasdermins and pannexin-1 mediate pathways of chemotherapy-induced cell lysis in hematopoietic malignancies" *Science Signaling*. **15**:eabl6781. doi: 10.1126/scisignal.abl6781. *corresponding author

Kondolf, H.C., D'Orlando, D.A., Dubyak, G.R. and **D.W. Abbott*.** (2023) "Protein engineering reveals that Gasdermin A preferentially targets mitochondrial membranes over the plasma membrane during pyroptosis." *Journal of Biological Chemistry*, 299(2):102908 doi: 10.1016/j.jbc.2023.102908 *corresponding author

Lethier, M., Huard, K., Hons, M., Favier, A., Brutscher, B., Boeri Erba, E., **Abbott, D.W.**, Cusack, S and E. Pellegrini. (2023) "Structural analysis shows that the BIR2 domain of E3 ligase XIAP 1 binds across the RIPK2 kinase dimer interface". *Life Science Alliance*. 6(11):e202201784

Zhou, B. and **D.W. Abbott*** (2023) "Chemical Modulation of Gasdermin D Activity: Therapeutic Implications and Consequences." *Seminars in Immunology*. doi: 10.1016/j.smim.2023.101845. *Corresponding author

O'Keefe, M.E., Dubyak, G.R. and **D.W. Abbott*** (2024) "Post-Translational control of NLRP3 signaling." *Journal of Biological Chemistry*. Published online ahead of print, doi: 10.1016/j.jbc.2024.107386 *corresponding author

O'Keefe, M.E., Kondolf, H.C., De Santis, S., Pizarro, T.T. and **D.W. Abbott***. (2025) "Restraint of inflammasome-driven cytokine responses through the mRNA stability protein TTP" Cell Reports. *In press*. *Corresponding author

Patents

“Method for Treating Inflammatory Diseases”
Provisional Patent Application No. 61/311,591, filing date March 8, 2010
Provisional Patent Application No. 61/408,827, filing date November 1, 2010
International PCT Patent Application No. PCT/US11/27555, filing date March 8, 2011
Inventors: Derek Abbott (50%) and Justine Tigno-Aranjuez (50%)

“Biomarkers to predict the efficacy of RIP2 inhibition in inflammatory disorders”
Invention Disclosure form filed April, 2012
Provisional Patent application filed October, 2012
Inventors: Derek Abbott (50%) and Justine Tigno-Aranjuez (50%)

Composition and Methods of Inhibiting Pyroptosis – Patent application submitted (CWRU 27877US). Will be public on August 25, 2019.
Inventors: Derek Abbott (90%) and Hannah Kondolf (10%)