Immunobiology

Cincinnati Children's

Division Data Summary

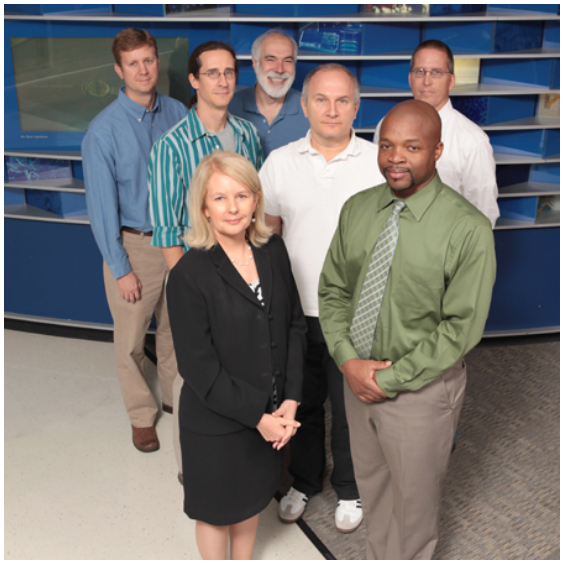
Research and Training Details

Number of Faculty	8
Number of Joint Appointment Faculty	2
Number of Research Fellows	10
Number of Research Students	9
Number of Support Personnel	16
Direct Annual Grant Support	$2,653,471
Direct Annual Industry Support	$99,355
Peer Reviewed Publications	45

Clinical Activities and Training

Number of Clinical Fellows	1

Division Photo



Row 1: M Wills-Karp, D Herbert
Row 2: I Lewkowich, HL Grimes
Row 3: M Jordan, F Finkelman, D Hildeman

Significant Publications

Lajoie S, Lewkowich IP, Suzuki Y, Clark JR, Sproles AA, Dienger K, Budelsky A, Wills-Karp M. **Complement-mediated regulation of the IL-17A axis is a central genetic determinant of the severity of experimental allergic asthma**. *Nature Immunol*. 11(10):928-35. 2010.

The mechanisms underlying the development of childhood asthma have been difficult to identify, as it is a clinically heterogeneous disorder. Dr. Wills-Karp and her colleagues have shown that severe forms of the disease may be driven by the activation of a novel Th17 cytokine pathway by the innate immune mediator, complement factor 3. These studies may inform the development of therapies designed specifically to treat the currently intractable forms of asthma.

Perkins C, Yanase N, Smulian G, Gildea L, Orekov T, Potter C, Brombacher F, Aronow B, Wills-Karp M, Finkelman FD. **Selective stimulation of IL-4 receptor on smooth muscle induces airway hyperresponsiveness in mice**. *J Exp Med*. 208(4):853-67, 2011.

Although airway constriction is the hallmark of asthma, the mechanisms driving this constriction have not been well understood. Dr. Finkelman and his colleagues demonstrated that IL-4Rs on airway smooth muscle are sufficient to induce the airway constriction associated with asthma. This paper opens the door for the development of smooth muscle-directed asthma therapies.

Zoller EE, Lykens JE, Terrell CE, Aliberti J, Filipovich AH, Henson PM, Jordan MB. **Hemophagocytosis causes a consumptive anemia of inflammation**. *J Exp Med*. 208(6):1203-14. 2011.

Cytopenias of unknown origin are commonly observed in patients during severe inflammation. Dr. Jordan and his colleagues have shown that high levels of the cytokine, IFN-g, which are produced during inflammation, drives the anemia through altering the ability of macrophages to endocytose red blood cells.

These findings define a unique pathological process underlying consumptive anemia that has broad clinical significance. The development of strategies to target IFN-g may have profound life-saving potential in patients with inflammation-induced anemias.

Chougnet CA, Tripathi P, Lages CS, Raynor J, Sholl A, Fink P, Plas DR, Hildeman DA. **A major role for Bim in regulatory T cell homeostasis**. *J Immunol*. 186(1):156-63. 2011.

An imbalance in T cell responses is associated with both impaired responses to infections and on the other hand the development of several immune diseases such as childhood arthritis, Crohn's disease, and asthma. Dr. Hildeman and his colleagues have shown that the regulation of the balance of harmful to beneficial T cells responses is influenced by a molecule referred to as Bim. Notably the T cell subset which dampens the function of other T cells, referred to as Tregulatory cells, have suppressed levels of Bim, leading to the survival of these immunosuppressive Tregs. This knowledge can be exploited for the development of therapies to either enhance immunity or suppress it in inflammatory diseases.

Meyer SE, Hasenstein JR, Baktula A, Velu CS, Xu Y, Wan H, Whitsett JA, Gilks CB, Grimes HL. **Kruppel-like factor 5 is not required for K-RasG12D lung tumorigenesis, but represses ABCG2 expression and is associated with better disease-specific survival**. *Am J Pathol*. 177(3):1503-13. 2010.

K-RAS mutations are found in approximately 30% of lung cancers. Kruppel-like Factor 5 (KLF5) has been shown to mediate cellular transformation signaling events downstream of oncogenic RAS in other cancers. Dr. Grimes and his colleagues explored the role KLF5 in lung tumorigenesis. They report that while KLF5 does not appear to be important in lung tumorigenesis, it plays an important role in suppressing responsiveness to the chemotherapeutic agent, doxorubician used clinically to treat lung cancer. This finding may lead to the development of therapies designed to enhance the efficacy of currently used chemotherapies and ultimately to patient survival.

Division Highlights

Fred Finkelman, MD

Dr. Finkelman and his colleagues identified new markers that can be used to distinguish whether anaphylaxis is mediated by IgE or IgG antibodies. Identification of the underlying antibody response may lead to the development of more specific therapies to prevent fatal anaphylactic responses in humans (Khodoun MV et al. **Identification of markers that distinguish IgE- from IgG-mediated anaphylaxis**. *PNAS.* 108(30):12413-8. 2011).

Jochen Mattner, MD

Dr. Mattner's lab identified Cd101 as the first genetic susceptibility gene in a model of primary biliary cirrhosis. They showed that the suppression of CD101 expression, a negative costimulatory molecule, on antigen presenting cells is associated with the development of overzealous T cell responses and severe liver autoimmunity (Mohammed JP et al. **Identification of Cd101 as a susceptibility gene for Novosphingobium aromaticivorans-induced liver autoimmunity**. *J. Immunol*. 187(1):337-49. 2011). This finding may provide a novel therapeutic target for the treatment of primary biliary cirrhosis.

David Hildeman, PhD

Dr. Hildeman has shown an important role for two molecules that regulate apoptosis, Bim and Bcl2, in regulatory T cell homeostasis in aged hosts (*J. Immunol*., 2011) and in controlling CD8+ effector T cell responses (*J. Immunol*., 2011), respectively. These findings may have major implications for developing therapies to restore T cell function in aged hosts and for controlling exaggerated T cell responses in a variety

of autoimmune diseases.

Others

Several members of our divisional faculty received honors and new appointments this year. Dr. Michael Jordan was promoted to Associate Professor with tenure. Dr. Wills-Karp was appointed Chair of the NIH AITRC study section and to the AAI Clinical Immunology Committee. Dr. Grimes was appointed to the Faculty of 1000, the ASH Ad-Hoc Scientific Committee on Bone Marrow Failure Leukemia and Lymphoma Society CDP review, and as Associate Editor for PLoS Genetics. Dr. Hildeman was appointed Director of the Immunobiology Graduate Program and as a permanent member of the NIH Cellular and Molecular Immunology-B (CMI-B) study section. Dr. Jordan was re-elected for a second term as chair of the scientific committee for the Histiocyte society. Dr. Finkelman was elected as Treasurer of FASEB.

Division Collaboration

Pediatric Ophthalmology » Marsha Wills-Karp, PhD; Ian Lewkowich, PhD; Richard Lang, PhD

Dr. Wills-Karp and Dr. Lewkowich collaborated with Dr. Richard Lang on a study that demonstrated that myeloid cells regulate angiogenesis through a non-canonical Wnt-Flt1 pathway (Stefater JA 3rd et al. **Regulation of angiogenesis by a non-canonical Wnt-Flt1 pathway in myeloid cells**. *Nature.* 474(7352):511-5. May 29, 2011).

Asthma Research » Marsha Wills-Karp, PhD; Gurjit Hershey, MD, PhD

Dr. Wills-Karp collaborated with Dr. Gurjit Hershey on a study demonstrating that Serpinb3 plays an important role in mucus production in a mouse model of asthma (Sivaprasad U et al. **A nonredundant role for mouse Serpinb3a in the induction of mucus production in asthma**. 127(1):254-261.e6. *JACI.* Jan, 2011).

Allergy and Immunology » Fred Finkelman, MD; Simon Hogan, PhD

Dr. Finkelman collaborated with Dr. Hogan to show that interleukin-13 (IL-13)/IL-13 receptor alpha1 (IL-13Ralpha1) signaling regulates intestinal epithelial cystic fibrosis transmembrane conductance regulator channel-dependent Cl-secretion (Wu D et al. **Interleukin-13 (IL-13)/(IL-13 receptor alpha1 (IL-13Ralpha1) signaling regulates intestinal epithelial cystic fibrosis transmembrane conductance regulator channel-dependent Cl- secretion**. *J Biol Chem*. 286(15):13357-69. Apr 15, 2011).

Critical Care Medicine » Ian Lewkowich, PhD; Kristen Page, PhD

Dr. Lewkowich working with Dr. Kristen Page showed that early immunological responses to German cockroach frass exposure induce a Th2/Th17 environment (Page K et al. **Early immunological response to German cockroach frass exposure induces a Th2/Th17 environment**. *J Innate Immun*. 3(2):167-79. 2011).

Molecular Immunology » Ian Lewkowich, PhD; Claire Chougnet, PhD

Dr. Lewkowich in collaboration with Dr. Chougnet demonstrated that blockade of the PD-1/PD-L1 partially restores T-cell function in aged mice (Laqes CS et al. **Partial restoration of T-cell function in aged mice by in vitro blockade of the PD-1/PD-L1 pathway**. *Aging Cell*. 9(5):785-98. Oct, 2010).

Exp. Hem. & Cancer Bio. - Cell Signaling » H. Leighton Grimes, PhD; Yi Zheng, PhD

Dr. Grimes collaborated with Dr. Zheng to show that IL-7 receptor and T-cell receptor signaling are coordinated by cell-division cycle 42 to maintain T-cell homeostasis (Guo F et al. **Coordination of IL-7 receptor and T-cell receptor signaling by cell-division cycle 42 in T-cell homeostasis**. *Proc Natl Acad Sci U S A*. Oct 26, 2010).

Bone Marrow Transplantation » Michael Jordan, MD; Stella Davies, MBBS, PhD, MRCP

Dr. Jordan collaborated with Dr. Stella Davies in a study that alternate-day micafungin antifungal prophylaxis may provide an attractive alternative to anti-fungal prophylaxis in pediatric patients undergoing hematopoietic stem cell transplantation (Mehta PA et al. **Alternate-day micafungin antifungal prophylaxis in pediatric patients undergoing hematopoietic stem cell transplantation: a pharmacokinetic study**. *Biol Blood Marrow Transplant*. Oct, 2010).

Bone Marrow Transplantation » Michael Jordan, MD; Rebecca Marsh, MD; Stella Davies, MBBS, PhD, MRCP; Jacob Bleesing, MD, PhD; Lisa Filipovich, MD

Dr. Jordan working with a team here at CCHMC including Drs. Marsh, Davies, Bleesing and Filipovich showed that reduced-intensity conditioning significantly improves survival of patients with hemophagocytic lymphohistiocytosis undergoing allogeneic hematopoietic cell transplantation (Marsh RA et al. **Reduced-intensity conditioning significantly improves survival of patients with hemophagocytic lymphohistiocytosis undergoing allogeneic hematopoietic cell transplantation**. *Blood.* Dec, 2010).

Exp. Hem. & Cancer Bio. - Cell Signaling » Yi Zheng, PhD; Jochen Mattner, MD; H. Leighton Grimes, PhD; David Hildeman, PhD; Marsha Wills-Karp, PhD

In a collaborative study with Dr. Zheng, Drs. Mattner, Grimes, Hildeman and Wills-Karp showed that the absence of cdc42, a member of the Rho GTPase family, was important for the development of more severe liver pathology upon infection (Guo F et al. **Distinct roles of Cdc42 in thymopoiesis and effector and memory T cell differentiation**. *PLoSOne.* Mar 24, 2011).

Others » Marsha Wills-Karp, PhD

The Cytokine and Mediator Core run by Dr. Wills-Karp continues to provide cytokine measurements to a wide range of investigators here at CCHMC/UC and around the country. The Digestive Health Center has incorporated the CMC Core into the Core services it offers its members.

Faculty Members

Marsha Wills-Karp, PhD, Professor

Division Director
Associate Director of Immunobiology Graduate Program
Rieveschl Professor of Pediatrics
Research Interests Immunopathogenesis of asthma

Fred Finkelman, MD, Professor

McDonald Professor, UC Department of Internal Medicine, Division of Rheumatology and Immunology
Research Interests Allergy/Asthma, Intestinal Parasites

H. Leighton Grimes, PhD, Associate Professor

Director Cancer Pathology Program
Research Interests Leukemia/Lymphoma

De'Broski Herbert, PhD, Assistant Professor

Research Interests Inflammatory Bowel Diseases/Intestinal Parasitic Infections

David A. Hildeman, PhD, Associate Professor

Director, Immunobiology Graduate Program
Research Interests T-cell Biology

Michael B. Jordan, MD, Associate Professor

Research Interests Childhood Immunodeficiency Diseases

Ian Lewkowich, PhD, Instructor

Research Interests The role of PD-1 family members in differential control of immune responses/Mechanisms of severe allergic asthma

Jochen Mattner, MD, Assistant Professor

Research Interests Autoimmune Liver Diseases

Joint Appointment Faculty Members

Eman Al-Khadra, MD, MPH, Assistant Professor

Critical Care Medicine

Kristen Page, PhD, Associate Professor

Critical Care Medicine

Trainees

- Pulak Tripathi, PhD, PGY-8, Markey Cancer Center, University of Kentucky, Lexington, Kentucky
- Chinavenmeni Velu, PhD, PGY-6, Texas Tech University Medical Center, Amarillo, Texas
- Erin Zoller, BS, GS-6, University of Virginia, Charlottesville, Virginia
- Andre Olsson, PhD, PGY-5, Lund University, Lund, Sweden
- Reena Rani, PhD, PGY-5, Chhatrapati Shahu Ji Maharaj University, Kanpur, India
- James Phelan, BS, GS-5, The Ohio State University, Columbus, Ohio
- Stephane Lajoie, PhD, PGY-4, McGill University, Montreal, Quebec, Canada
- Aditya Chaubey, PhD, PGY-4, Clemson University, Clemson, South Carolina
- Theodore Johnson, MD, PGY-4, Medical College of Georgia, Augusta, Georgia
- Andrew Lindsley, MD/PhD, PGY-4, Indiana University, Indianapolis, Indiana
- Sema Kurtulus, BS, GS-4, Sabanci University, Istanbul, Turkey
- Yusuke Suzuki, PhD, PGY-3, Kelo University, Tokyo, Japan
- Supriya Pokkali, PhD, PGY-3, Tuberculosis Research Center, Chennai, India
- Mark Webb, BS, GS-3, Brigham Young University, Provo, Utah
- Catherine Buckingham, BS, GS-3, Asbury College, Wilmore, Kentucky
- Stacey Burgess, BS, GS-3, Marietta College, Marietta, Ohio
- Jana Raynor, BS, GS-3, North Georgia College and State University, Dahlonega, Georgia
- Sara Stoffers, BS, GS-3, University Central Florida, Orlando, Florida
- Sara Meyer, PhD, PGY-2, University of Cincinnati, Cincinnati, Ohio
- Naina Gour, BS, GS-2, University of Delhi, Delhi, India

Significant Accomplishments

Insights into the Pathogenesis of Severe Asthma

The Division of Immunobiology has made significant strides toward its mission to elucidate the underlying mechanisms of immune-related diseases in children. These insights bring us closer to development of novel therapies for the treatment of childhood diseases. In particular, asthma is the leading cause of hospitalization in children. Although existing therapies effectively control mild forms of asthma, severe disease is not controlled by currently available therapies. Marsha Wills-Karp, PhD, and colleagues have identified a novel pathway by which severe asthma may develop. Specifically, they showed that overproduction of an innate immune mediator, complement factor C3, leads to aberrant Th17 cell responses, which induce severe

asthma. This recognition may lead to the development of novel therapies for difficult-to-treat asthma (Lajoie, *Nat. Immunol*., 2010).

Mechanisms of Anemia in Children

Unexplained anemia and other low-blood counts are often found in patients who develop sudden and severe inflammation. Patients with these conditions, such as sepsis, can also look quite similar to children with a unique inborn immune disorder called hemophagocytic lymphohistiocytosis (HLH). Michael B. Jordan, MD, and his colleagues have found that a particular inflammatory molecule, interferon gamma (IFN-γ), which is found in excess in children with HLH, is a critical driver of the acute anemia observed during diverse microbial infections via a unique mechanism called hemophagocytosis (Zoller, *JEM*, 2011). In a related study, Jordan opened and expanded a multicenter clinical trial, called "Hybrid Immunotherapy for Hemophagocytic Lymphohistiocytosis" (HIT-HLH), which tests the idea that a unique combination of therapies that arrest damaging immune responses in this disorder may improve current treatments. As significant numbers of HLH patients die during the initial phases of therapy, this approach should improve survival of children with HLH.

Potential Novel Treatment for Fatal Food Allergies

Fatal anaphylactic responses have been associated with ingestion of certain foods such as peanuts in allergic individuals. Fred Finkelman, MD, and his colleagues have recently demonstrated that the production of IgG antibodies, rather than IgE antibodies, to food allergens is protective and that delivery of IgG antibodies systemically can suppress the induction of shock by food allergens (*JACI*, 2011). Moreover, they have identified new markers that can be used to distinguish whether an individual develops a deleterious IgE or protective IgG antibody response. Identification of the underlying antibody response may lead to the development of more specific therapies to prevent fatal anaphylactic responses in children (Khodoun et al., *PNAS*, 2011).

Division Publications

1. Arumugam M, Ahrens R, Osterfeld H, Kottyan LC, Shang X, Maclennan JA, Zimmermann N, Zheng Y, Finkelman FD, Hogan SP. **Increased susceptibility of 129SvEvBrd mice to IgE-Mast cell mediated anaphylaxis**. *BMC Immunol*. 2011; 12:14.
2. Baye TM, Butsch Kovacic M, Biagini Myers JM, Martin LJ, Lindsey M, Patterson TL, He H, Ericksen MB, Gupta J, Tsoras AM, Lindsley A, Rothenberg ME, Wills-Karp M, Eissa NT, Borish L, Khurana Hershey GK. **Differences in candidate gene association between European ancestry and African American asthmatic children**. *PLoS One*. 2011; 6:e16522.
3. Chae HD, Siefring JE, Hildeman DA, Gu Y, Williams DA. **RhoH regulates subcellular localization of ZAP-70 and Lck in T cell receptor signaling**. *PLoS One*. 2010; 5:e13970.
4. Chavez Valdez R, Ahlawat R, Wills-Karp M, Nathan A, Ezell T, Gauda EB. **Correlation between serum caffeine levels and changes in cytokine profile in a cohort of preterm infants**. *J Pediatr*. 2011; 158:57-64, 64 e1.
5. Chougnet CA, Tripathi P, Lages CS, Raynor J, Sholl A, Fink P, Plas DR, Hildeman DA. **A major role for Bim in regulatory T cell homeostasis**. *J Immunol*. 2011; 186:156-63.
6. Doetschman T, Sholl A, Chen H, Gard C, Hildeman DA, Bommireddy R. **Divergent effects of calcineurin Abeta on regulatory and conventional T-cell homeostasis**. *Clin Immunol*. 2011; 138:321-30.
7. Finkelman FD. **IgE-dependent and independent effector mechanisms in human and murine anaphylaxis**. *Anaphylaxis and hypersensitivity reactions.* New York: Humana Press : Springer; 2011: 127-

144. .
8. Finkelman FD. **Peanut allergy and anaphylaxis**. *Curr Opin Immunol*. 2010; 22:783-8.
9. Guo F, Hildeman D, Tripathi P, Velu CS, Grimes HL, Zheng Y. **Coordination of IL-7 receptor and T-cell receptor signaling by cell-division cycle 42 in T-cell homeostasis**. *Proc Natl Acad Sci U S A*. 2010; 107:18505-10.
10. Guo F, Zhang S, Tripathi P, Mattner J, Phelan J, Sproles A, Mo J, Wills-Karp M, Grimes HL, Hildeman D, Zheng Y. **Distinct roles of Cdc42 in thymopoiesis and effector and memory T cell differentiation**. *PLoS One*. 2011; 6:e18002.
11. Jenkins SJ, Ruckerl D, Cook PC, Jones LH, Finkelman FD, van Rooijen N, MacDonald AS, Allen JE. **Local macrophage proliferation, rather than recruitment from the blood, is a signature of TH2 inflammation**. *Science*. 2011; 332:1284-8.
12. Jones TG, Finkelman FD, Austen KF, Gurish MF. **T regulatory cells control antigen-induced recruitment of mast cell progenitors to the lungs of C57BL/6 mice**. *J Immunol*. 2010; 185:1804-11.
13. Kasten KR, Prakash PS, Unsinger J, Goetzman HS, England LG, Cave CM, Seitz AP, Mazuski CN, Zhou TT, Morre M, Hotchkiss RS, Hildeman DA, Caldwell CC. **Interleukin-7 (IL-7) treatment accelerates neutrophil recruitment through gamma delta T-cell IL-17 production in a murine model of sepsis**. *Infect Immun*. 2010; 78:4714-22.
14. Kasten KR, Tschop J, Adediran SG, Hildeman DA, Caldwell CC. **T cells are potent early mediators of the host response to sepsis**. *Shock*. 2010; 34:327-36.
15. Kasten KR, Tschop J, Goetzman HS, England LG, Dattilo JR, Cave CM, Seitz AP, Hildeman DA, Caldwell CC. **T-cell activation differentially mediates the host response to sepsis**. *Shock*. 2010; 34:377-83.
16. Kong KY, Owens KS, Rogers JH, Mullenix J, Velu CS, Grimes HL, Dahl R. **MIR-23A microRNA cluster inhibits B-cell development**. *Exp Hematol*. 2010; 38:629-640 e1.
17. Kurtulus S, Tripathi P, Moreno-Fernandez ME, Sholl A, Katz JD, Grimes HL, Hildeman DA. **Bcl-2 allows effector and memory CD8+ T cells to tolerate higher expression of Bim**. *J Immunol*. 2011; 186:5729-37.
18. Kurtulus S, Tripathi P, Opferman JT, Hildeman DA. **Contracting the 'mus cells'--does down-sizing suit us for diving into the memory pool?**. *Immunol Rev*. 2010; 236:54-67.
19. Lages CS, Lewkowich I, Sproles A, Wills-Karp M, Chougnet C. **Partial restoration of T-cell function in aged mice by in vitro blockade of the PD-1/ PD-L1 pathway**. *Aging Cell*. 2010; 9:785-98.
20. Lajoie S, Lewkowich IP, Suzuki Y, Clark JR, Sproles AA, Dienger K, Budelsky AL, Wills-Karp M. **Complement-mediated regulation of the IL-17A axis is a central genetic determinant of the severity of experimental allergic asthma**. *Nat Immunol*. 2010; 11:928-35.
21. Lin AA, Wojciechowski SE, Hildeman DA. **Androgens suppress antigen-specific T cell responses and IFN-gamma production during intracranial LCMV infection**. *J Neuroimmunol*. 2010; 226:8-19.
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; 116:1079-82.
23. Marsh RA, Satake N, Biroschak 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; 55:134-40.
24. 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; 116:5824-31.
25. Mattner J. **Genetic susceptibility to autoimmune liver disease**. *World J Hepatol*. 2011; 3:1-7.

26. McCormack MC, Breysse PN, Matsui EC, Hansel NN, Peng RD, Curtin-Brosnan J, Williams DL, Wills-Karp M, Diette GB. **Indoor particulate matter increases asthma morbidity in children with non-atopic and atopic asthma**. *Ann Allergy Asthma Immunol*. 2011; 106:308-15.
27. McCoy ME, Finkelman FD, Straus DB. **Th2-specific immunity and function of peripheral T cells is regulated by the p56Lck Src homology 3 domain**. *J Immunol*. 2010; 185:3285-94.
28. 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 micafungin antifungal prophylaxis in pediatric patients undergoing hematopoietic stem cell transplantation: a pharmacokinetic study**. *Biol Blood Marrow Transplant*. 2010; 16:1458-62.
29. Meyer SE, Hasenstein JR, Baktula A, Velu CS, Xu Y, Wan H, Whitsett JA, Gilks CB, Grimes HL. **Kruppel-like factor 5 is not required for K-RasG12D lung tumorigenesis, but represses ABCG2 expression and is associated with better disease-specific survival**. *Am J Pathol*. 2010; 177:1503-13.
30. Milner JD, Orekov T, Ward JM, Cheng L, Torres-Velez F, Junttila I, Sun G, Buller M, Morris SC, Finkelman FD, Paul WE. **Sustained IL-4 exposure leads to a novel pathway for hemophagocytosis, inflammation, and tissue macrophage accumulation**. *Blood*. 2010; 116:2476-83.
31. Page K, Zhou P, Ledford JR, Day SB, Lutfi R, Dienger K, Lewkowich IP. **Early immunological response to German cockroach frass exposure induces a Th2/Th17 environment**. *J Innate Immun*. 2011; 3:167-79.
32. Perkins C, Yanase N, Smulian G, Gildea L, Orekov T, Potter C, Brombacher F, Aronow B, Wills-Karp M, Finkelman FD. **Selective stimulation of IL-4 receptor on smooth muscle induces airway hyperresponsiveness in mice**. *J Exp Med*. 2011; 208:853-67.
33. Phelan JD, Shroyer NF, Cook T, Gebelein B, Grimes HL. **Gfi1-cells and circuits: unraveling transcriptional networks of development and disease**. *Curr Opin Hematol*. 2010; 17:300-7.
34. Rudra JS, Tripathi PK, Hildeman DA, Jung JP, Collier JH. **Immune responses to coiled coil supramolecular biomaterials**. *Biomaterials*. 2010; 31:8475-83.
35. Sharif-Askari E, Vassen L, Kosan C, Khandanpour C, Gaudreau MC, Heyd F, Okayama T, Jin J, Rojas ME, Grimes HL, Zeng H, Moroy T. **Zinc finger protein Gfi1 controls the endotoxin-mediated Toll-like receptor inflammatory response by antagonizing NF-kappaB p65**. *Mol Cell Biol*. 2010; 30:3929-42.
36. Sivaprasad U, Askew DJ, Ericksen MB, Gibson AM, Stier MT, Brandt EB, Bass SA, Daines MO, Chakir J, Stringer KF, Wert SE, Whitsett JA, Le Cras TD, Wills-Karp M, Silverman GA, Khurana Hershey GK. **A nonredundant role for mouse Serpinb3a in the induction of mucus production in asthma**. *J Allergy Clin Immunol*. 2011; 127:254-61, 261 e1-6.
37. Stefater JA, 3rd, Lewkowich I, Rao S, Mariggi G, Carpenter AC, Burr AR, Fan J, Ajima R, Molkentin JD, Williams BO, Wills-Karp M, Pollard JW, Yamaguchi T, Ferrara N, Gerhardt H, Lang RA. **Regulation of angiogenesis by a non-canonical Wnt-Flt1 pathway in myeloid cells**. *Nature*. 2011; 474:511-5.
38. Strait RT, Mahler A, Hogan S, Khodoun M, Shibuya A, Finkelman FD. **Ingested allergens must be absorbed systemically to induce systemic anaphylaxis**. *J Allergy Clin Immunol*. 2011; 127:982-9 e1.
39. Tripathi P, Kurtulus S, Wojciechowski S, Sholl A, Hoebe K, Morris SC, Finkelman FD, Grimes HL, Hildeman DA. **STAT5 is critical to maintain effector CD8+ T cell responses**. *J Immunol*. 2010; 185:2116-24.
40. Wills-Karp M. **Allergen-specific pattern recognition receptor pathways**. *Curr Opin Immunol*. 2010; 22:777-82.
41. Wu D, Ahrens R, Osterfeld H, Noah TK, Groschwitz K, Foster PS, Steinbrecher KA, Rothenberg ME, Shroyer NF, Matthaei KI, Finkelman FD, Hogan SP. **Interleukin-13 (IL-13)/IL-13 receptor alpha1 (IL-13Ralpha1) signaling regulates intestinal epithelial cystic fibrosis transmembrane conductance regulator channel-dependent Cl- secretion**. *J Biol Chem*. 2011; 286:13357-69.
42. Zhang X, Schmudde I, Laumonnier Y, Pandey MK, Clark JR, Konig P, Gerard NP, Gerard C, Wills-Karp M,

Kohl J. **A critical role for C5L2 in the pathogenesis of experimental allergic asthma**. *J Immunol*. 2010; 185:6741-52.

43. Zhu H, Perkins C, Mingler MK, Finkelman FD, Rothenberg ME. **The role of neuropeptide S and neuropeptide S receptor 1 in regulation of respiratory function in mice**. *Peptides*. 2011; 32:818-25.
44. 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; 208:1203-14.
45. Zuo L, Fulkerson PC, Finkelman FD, Mingler M, Fischetti CA, Blanchard C, Rothenberg ME. **IL-13 induces esophageal remodeling and gene expression by an eosinophil-independent, IL-13R alpha 2-inhibited pathway**. *J Immunol*. 2010; 185:660-9.

Grants, Contracts, and Industry Agreements

Grant and Contract Awards		Annual Direct / Project Period Direct
FINKELMAN, F		
Direct IL-4 and IL-13 Effects on Pulmonary Smooth Muscle in Allergic Airway Disease		
National Institutes of Health		
R01 HL 097360	09/01/09-08/31/11	$312,500
GRIMES, L		
Epigenetic Manipulation of Leukemia		
National Institutes of Health		
R21 CA 142601	07/01/09-06/30/11	$110,000
Building New Treatment for Leukemia using Nanotechnology		
Cancer Free Kids		
	07/01/10-06/30/11	$20,000
Gfi-1 and Osteoblast Suppression in Multiple Myeloma		
National Institutes of Health(University of Pittsburgh)		
R01 AR 059679	07/26/10-06/30/15	$22,500
A New Target in T Cell Acute Lymphoblastic Leukemia		
Cancer Free Kids		
	05/04/11-05/03/12	$15,000
HERBERT, D		
Alternative Macrophage Activation Limits Immunopathology		
National Institutes of Health		
R01 GM 083204	09/13/09-07/31/12	$173,250
Regulation of Antibody-Mediated Disorders		
National Institutes of Health(University of Cincinnati)		
R01 AI 072040	09/12/09-07/31/11	$21,261
CD8+ T Cell Homeostasis by IL-4		
National Institutes of Health(University of Cincinnati)		
R01 AI 070300	01/01/10-12/31/12	$8,408
HILDEMAN, D		
Regulation of Apoptosis in Activated Primary T Cells		
National Institutes of Health		
R01 AI 057753	07/01/10-06/30/11	$71,220
Regulation of Apoptosis in Activated Primary T Cells		
National Institutes of Health		
R01 AI 057753	12/01/08-11/30/13	$252,760
Transforming Growth Factor Beta in T-Cell Homeostasis and Tolerance		
National Institutes of Health(Arizona Board of Regents)		

R01 AI 067903	03/01/07-02/28/12	$21,377

JORDAN, M

An Animal Model of Hemophagocytic Lymphohistiocytosis
National Institutes of Health

R01 HL 091769	08/10/07-06/30/12	$250,000

LEWKOWICH, I

Synergistic Roles of IL-17 in Asthma Susceptibility
Parker B. Francis Fellowship Program

	07/01/10-06/30/13	$52,000

MATTNER, J

Primary Biliary Cirrhosis: Molecular Genetics and Microbe
National Institutes of Health

R01 DK 084054	06/01/09-05/31/14	$171,518.00

WILLS-KARP, M

Mechanism of PM Induced Dendritic Cell Activation
National Institutes of Health(The Johns Hopkins University)

P50 ES 015903	09/29/07-06/30/12	$214,789

Epithelial Regulation of Th2 Immune Responses in the Lung
National Institutes of Health

R01 AI 083315	08/20/09-07/31/14	$247,500

MoFlo XDP Cell Sorter
National Institutes of Health

S10 RR 031653	02/15/11-02/14/12	$462,394

Epithelial Genes in Allergic Inflammation - Project 3
National Institute of Health

U19 AI 070235	09/15/06-08/31/11	$188,202.00

Digestive Health Center: Bench to Bedside in Research in Pediatrics Digestive Disease
National Institutes of Health

P30 DK 078392	06/01/10-05/31/12	$38,792.00
	Current Year Direct	**$2,653,471**

Industry Contracts

JORDAN, M

Therapure BioPharma, Inc	$30,800

WILLS-KARP, M

Allertein Therapeutics	$47,355
Current Year Direct Receipts	**$99,355**
Total	**$2,752,826**

Immunobiology Graduate Program

The Immunobiology Graduate Program is an inter-departmental program within the University of Cincinnati that offers PhD and MS degrees in Immunology. The Division of Immunobiology serves as the administrative home of the Graduate Program. The program is governed by Director Dr. David Hildeman, Associate Director Dr. Marsha Wills-Karp and a Steering Committee composed of members of several departments/divisions at CCHMC and UC. Dr. Jonathan Katz is the coordinator of the Foundations in Immunology Courses.

The Immunobiology Program provides broadly based instruction in immunology, along with rigorous research training that

emphasizes modern approaches to understanding the function of the immune system in health and disease. To this end, the program currently has 31 faculty members from 4 departments and 12 divisions within the College of Medicine and CCHMC. We currently have a total of 34 outstanding students (31 PhD students and 3 MS students) from around the country and abroad. This academic year we celebrated the graduation of 2 PhD students and 2 MS students. Our students have distinguished themselves already by receiving several travel and research awards (AAAI, Yates Scholarship Award, Ryan Scholarship Award and an NIH F30 Award).

The Program is supported financially by a variety of sources. This year, tuition support was provided through University Graduate Scholarships awarded by the University of Cincinnati. Student stipends were supported through a variety of sources including funds from the University of Cincinnati (UGA), NIH training grants, external grants to their advisors, and funds from Cincinnati Children's Research Foundation. The program anticipates sustained growth over the next few years with a target class size of 10 new students per year.

Immunobiology Graduate Program Students, 2010-2011

Student	Faculty Mentor	Admission Year
Jessica Allen	Christopher Karp	2004
Erin Zoller	Michael Jordan	2005
Katherine Groschwitz	Simon Hogan	2005
James Phelan	H. Leighton Grimes	2006
Jill Fritz	Timothy Weaver	2006
Joni Prasad	Jay Degen	2006
Amanda Beichler Waddell	Simon Hogan	2007
Cortez McBerry	Julio Aliberti	2007
Rachael Mintz	Gurjit Hershey	2007
Sema Kurtulus	David Hildeman	2007
Ibrahim Aksoylar	Kasper Hoebe	2007
Stacey Burgess	Marsha Wills-Karp	2008
Samuel Vaughn	Thomas Griffin	2008
Isaac Harley	Christopher Karp	2008
Catherine Buckingham	Marsha Wills-Karp	2008
Jana Raynor	David Hildeman	2008
Sara Stoffers	H.Leighton Grimes	2008
Bo Liu	Yui-Hsi Wang	2008
Mark Webb	Marsha Wills-Karp	2008
Nick Boespflug	Christopher Karp	2009

Jordan Downey	Christopher Karp	2009
Naina Gour	Marsha Wills-Karp	2009
Jonathan McNally	Edith Janssen	2009
Maria Fields	Claire Chougnet	2009
Harini Raghu	Matthew Flick	2009
Akash Verma	George Deepe	2009
Yunguan Wang	Fred Finkelman	2009
Olivia Ballard	Ardythe Morrow	2010
Kyle Bednar	William Ridgway	2010
Roger Fecher	George Deepe	2010
Wenting Huang	William Ridgway	2010
Jennifer Leddon	Timothy Cripe	2010
Ke Liu	John Harley	2010
Hesham Shehata	Claire Chougnet	2010

Student Honors

Stacey Burgess 2011 Center for Environmental Genetics NIS award, University of Cincinnati

Naina Gour 2011 UC-GSGA-Conference Travel Award for attending The American Academy of Allergy, Asthma and Immunology Conference

Katherine R. Groschwitz 2008 – 2010 NIH F30 DK082113 “Mast cell-mediated intestinal permeability”

Isaac T. W. Harley 2011 – 2013 Albert J. Ryan Fellowship

Sema Kurtulus 2011 – 2012 UC Distinguished Dissertation Completion Fellowship

Jennifer Leddon 2011-2012 Cancer Free Kids grant

Cortez C. McBerry 2008 - 2012 Albert C. Yates Fellowship

Rachael A. Mintz-Cole 2010 Ruth L. Kirchstein National Research Service Award Individual Fellowship; 2010 2nd Place: University of Cincinnati Graduate Student Poster Forum; 2011 Chrysallis Travel Award Recipient (AAAAI)

Maria E. Moreno-Fernandez 2010 John Wallace Diversity Scholarship, Autumn Immunology Congress**;** 2010 HIV pathogenesis Scholarship National Institute Health, Office of AIDS Research, Keystone Symposia

James D. Phelan 2010 External Fellowship through The Ohio State Comprehensive Cancer Center; 2010 Center for Immunological Research Retreat, 1st Place Poster Award; 2010 American Society of Hematology Travel Award; 2011 Pelotonia Graduate Fellowship

Amanda B. Waddell 2009 - 2011 American Gastroenterological Association Foundation Graduate Student Award

Student Publications

Naina Gour (2009) Janssen EM, Lemmens EE, **Gour N**, Reboulet RA, Green DR, Schoenberger SP, Pinkoski MJ. Distinct roles of cytolytic effector molecules for antigen-restricted killing by CTL *in vivo.* Immunol Cell Biol. (2010) 88(7):761-5.

Katherine R. Groschwitz (2005) Munitz A, Cole ET, Beichler A, **Groschwitz K**, Ahrens R, Steinbrecher K, Willson T, Han X, Denson L, Rothenberg ME, Hogan SP. Paired immunoglobulin-like receptor B (PIR-B) negatively regulates macrophage activation in experimental colitis. Gastroenterology. (2010) 139(2):530-41.

Han X, Gilbert S, **Groschwitz K**, Hogan S, Jurickova I, Trapnell B, Samson C, Gully J. Loss of GM-CSF signalling in non-haematopoietic cells increases NSAID ileal injury. Gut. (2010) 59(8):1066-78.

Isaac T. W. Harley (2008) Phillips C, Gerbing R, Alonzo T, Perentesis JP, **Harley ITW**, Meshinchi S, Bhatla D, Radloff G, Davies SM. MDM2 Polymorphism Increases Susceptibility to Childhood Acute Myeloid Leukemia: A Report From the Children's Oncology Group. Pediatr Blood Cancer. (2010) 55(2):248-253.

Harley ITW, Niewold T, Stormont RM, Kaufman KM, Glenn SB, Franek BS, Kelly JA, Kilpatrick JR, Hutchings D, Divers J, Bruner GR, Edberg JC, McGwin JR G, Petri MA, Ramsey-Goldman R, Reveille JD, Vila-Perez LM, Merrill JT, Gilkeson G, Vyse TJ, Alarcon-Riquelme ME, Cho S-K, Jacob CO, Alarcon GS, Moser KL, Gaffney PM, Kimberly RP, Bae S-C, Langefeld CD, Harley JB, Guthridge JM, James JA. The role of genetic variation near interferon-k in systemic lupus erythematosus. J Biomed Biotechnol. (2010) Cytokines in SLE special issue vol. 2010, 2010:706825.

Schauberger EM, Ewart SL, Arshad SH, Huebner M, Karmaus W, Holloway JW, Friderici KH, Ziegler J, Rose-Zerilli MJ, Barton SJ, Holgate ST, Kilpatrick JR, Harley JB, Lajoie-Kadoch S, **Harley ITW**, Hamid Q, Kurukulaaratchy RJ, Seibold MA, Avila PC, Rodriguez-Citron W, Rodriguez-Santana JR, Hu D, Gignoux C, Romieu I, London SJ, Burchard EG, Langefeld CD, Wills-Karp M. Identification of *ATPAF1* as a novel candidate gene for asthma in children. J Allergy Clin Immunol. 2011 June 20, Epub ahead of print.

Sema Kurtulus (2007) Kurtulus S, Tripathi P, Opferman JT, Hildeman DA. Contracting Tripathi P, **Kurtulus S**, Wojciechowski S, Sholl A, Hoebe K, Morris S, Finkelman F, Grimes HL, Hildeman DA. STAT5 is critical to maintain effector CD8+ T cell responses. J Immunol. (2010) 185(4):2116-24.

Kurtulus S, Tripathi P, Moreno-Fernandez M, Sholl A, Katz JD, Grimes HL, Hildeman DA. Bcl-2 allows Effector and memory CD8+ T cells to tolerate higher expression of Bim. J Immunol. (2011) 186 (10): 5729-37.

Jennifer Leddon (2010) Browne AW, **Leddon JL,** Currier MA, Williams JP, Frischer JS, Collins MH, Ahn CH, Cripe TP. Cancer screening by systemic administration of a gene delivery vector encoding tumor-selective secretable biomarker expression. PLoS One. (2011) 6(5):e19530.

Bo Liu (2008) Wang YH, Voo KS, **Liu B**, Chen CY, Uygungil B, Spoede W, Bernstein JA, Huston DP, Liu YJ. A novel subset of CD4(+) T(H)2 memory/effector cells that produce inflammatory IL-17 cytokine and promote the exacerbation of chronic allergic asthma. J Exp Med. (2010) 207(11):2479-91.

Rachael A. Mintz-Cole (2007) Mintz-Cole R, Gibson A, Reponenen T, Hershey GK. Mold-Specific Differences in Inflammatory Responses in the Lungs. Journal of Allergy and Clinical Immunology (2010) 125(2):AB46. Abstract.

Maria E. Moreno-Fernandez (2009) Kurtulus S, Tripathi P, **Moreno-Fernandez ME**, Sholl A, Katz JD, Grimes HL, Hildeman DA. Bcl-2 Allows Effector and Memory $CD8^+$ T Cells To Tolerate Higher Expression of Bim. J Immunol. (2011) 15;186(10):5729-37.

Moreno-Fernandez ME, Rueda CM, Rusie LK, Chougnet CA. Regulatory T cells control HIV replication in activated T cells through a cAMP-dependent mechanism. Blood. (2011) 117(20):5372-80.

James D. Phelan (2006) Phelan JD, Cook TA, Gebelein B, Shroyer N, Grimes HL. Gfi1—Cells & Circuits: Unraveling transcriptional networks of development and disease. Curr Opin Hematol. (2010) 17(4):300-7.

Guo F, Zhang S, Tripathi P, Mattner J, **Phelan JD**, Sproles A, Mo J, Wills-Karp M, Grimes HL, Hildeman D, Zheng Y. Distinct roles of Cdc42 in thymopoiesis and effector and memory T cell differentiation. PLoS ONE (2011) 6(3):e18002.

Harini Raghu (2009) Raghu H, Flick MJ. Targeting the Coagulation Factor Fibrinogen for Arthritis Therapy. Curr Pharm Biotechnol. 2011 Mar 14, Epub ahead of print.

Sara L. Stoffers (2008) Stoffers SL, Meyer SE, Grimes HL. MicroRNAs in the midst of myeloid signal transduction. J Cell Physiol. 2011 May 12, Epub ahead of print.

Amanda B. Waddell (2007) Munitz A, Cole E, **Beichler (Waddell) A**, Groschwitz K, Ahrens R, Steinbrecher K, Willson T, Han X, Denson L, Rothenberg ME, Hogan SP. Paired Immunoglobulin-like receptor B (PIR-B) negatively regulates macrophage activation in experimental colitis. Gastroenterology (2010) 139 (2): 530-541.

Waddell A, Ahrens R, Steinbrecher K, Donovan B, Rothenberg ME, Munitz A, Hogan SP. Colonic Eosinophilic Inflammation in Experimental Colitis Is Mediated by Ly6Chigh CCR2+ Inflammatory Monocyte/Macrophage-Derived CCL11. J Immunol (2011) 186:5993-6003.

Erin E. Zoller (2005) Lykens JE, Terrell CE, **Zoller EE**, Risma K, Jordan MB. Perforin is a critical physiologic regulator of T-cell activation. Blood. (2011) 118(3):618-26.

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) 208(6):1203-14.

Student Presentations

ORAL PRESENTATIONS

Catherine M. Buckingham (2008) Buckingham CM. IL-17A exacerbates airway hyperresponsiveness by suppressing T regulatory cell-mediated protection. Autumn Immunology Conference, Chicago, IL 2010

Jill Fritz (2006) Fritz J. The UPR chaperone ERdj4 impacts early B cell development. Immunobiology Division Meeting, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2011

Fritz J. The UPR chaperone ERdj4 impacts early B cell development. Pulmonary Biology Division Meeting, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2011

Naina Gour (2009) Gour N, Wills-Karp M. Carbohydrates in Dust Mite Allergen Promote IL-10 Production by Dendritic Cells. Autumn Immunology Conference, Chicago, IL 2010

Isaac T. W. Harley (2008) Harley I. The role of Intestinal Bacteria in the Development of Diet-induced Obesity. University of Cincinnati PSTP Program Meeting, Cincinnati, OH 2010

Rachael A. Mintz-Cole (2007) Mintz-Cole R, Gibson A, Reponen T, Hershey GK. Induction of CD80 and CD86 on APCs after exposure to *Aspergillus versicolor* or *Cladosporium cladosporioides* is correlated with distinct T cell responses. Autumn Immunology Conference, Chicago, IL 2010

Maria E. Moreno-Fernandez (2009) Presicce P, Rusie LK, Moreno-Fernandez ME, Fichtenbaum C, Chougnet CA. Induction of adaptive regulatory T cells by HIV infected dendritic cells is defective. Annual Meeting of the American Association of Immunologist, San Francisco, CA 2011

Moreno-Fernandez ME, Rueda CM, Rusie LK, Chougnet CA. Regulatory T cells control HIV replication in activated T cells

through contact-dependent and independent pathways. Autumn Immunology Conference, Chicago, IL 2010

Moreno-Fernandez ME, Rueda CM, Rusie LK, Chougnet CA. Regulatory T cells control HIV replication in activated T cells. Trainees' Research Grand Round, University of Cincinnati, Cincinnati, OH 2010

James D. Phelan (2006) Phelan J. Lymphoid malignancies critically require Growth factor independent 1 (Gfi1) for tumor initiation and maintenance. Experimental Hematology Floor Meeting, Division of Experimental Hematology, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2011

Phelan J. Lymphoid malignancies critically require Growth factor independent 1 (Gfi1) for tumor initiation and maintenance. Cancer Therapeutics Data Club, University of Cincinnati College of Medicine, Department of Cancer & Cell Biology, Cincinnati, OH 2010

Phelan J. Lymphoid malignancies critically require Growth factor independent 1 (Gfi1) for tumor initiation and maintenance. Student Post-Doc Forum, Division of Immunobiology, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2010

Phelan J. Notch-induced lymphoid malignancies critically require growth factor independent 1 (Gfi1) for tumor initiation and maintenance. Notch Data Club, Intra-divisional conference, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2010

Joni Prasad (2006) Prasad J. Host fibrinogen and the *S. aureus*-encoded procoagulant vWbp are context-dependent determinants of bacterial virulence. American Society of Hematology Conference, Orlando, FL 2010

Amanda B. Waddell (2007) Waddell A. Macrophage and eosinophil interactions in inflammatory bowel diseases. Department of Immunobiology Student/PostDoc Forum, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2011

Yunguan Wang (2009) Wang Y. Involvement of complement in IgG2a induced murine systemic anaphylaxis. Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2011

Erin E. Zoller (2005) Zoller E. Systemic IFN-g induces hemophagocytosis by macrophages causing a consumptive anemia of inflammation. Histiocyte Society Annual Meeting, Boston, MA 2010

POSTER PRESENTATIONS

Halil Ibrahim Aksoylar (2007) Aksoylar HI, Lampe K, Hoebe K. Intestinal inflammation in *Gimap5* deficient mice: A Possible link between loss of FoxO expression and impaired Treg function. Annual Meeting of American Association of Immunologists, San Francisco, CA 2011

Nicholas D. Boespflug (2009) Boespflug ND, Karp C. Adherence-induced ATF3expression: a mechanism underlying differences in macrophage subsetresponsiveness? PSTP and Immunobiology Program Poster Sessions, University of Cincinnati, Cincinnati, OH 2010

Stacey Burgess (2008) Burgess S, Wills-Karp M. Segmented Filamentous Bacteria Exacerbate Experimental Murine Asthma. Autumn Immunology Conference, Chicago, IL 2010

Burgess S, Wills-Karp M. Segmented Filamentous Bacteria In The Exacerbation of Experimental Murine Asthma. American Academy of Allergy, Asthma and Immunology Annual Conference, San Francisco, CA 2011

Jill Fritz (2006) Fritz J, Dong M, Weaver T. The UPR chaperone ERdj4 impacts early B cell development . Center for Immunological Research Annual Retreat, Loveland, OH 2010

Fritz J, Dong M, Weaver T. The UPR chaperone ERdj4 impacts early B cell development . Keystone Symposia, Whistler, BC 2011

Giebel JD, Fritz J, Akinbi HT, Hanna PC. The Role of Host Lysozyme in Bacillus anthracis Virulence . 111th General Meeting American Society for Microbiology, New Orleans, LA 2011

Naina Gour (2009) Gour N, Wills-Karp M. Carbohydrates in Dust Mite Allergen Promote IL-10 Production by Dendritic Cells. Autumn Immunology Conference, Chicago, IL 2010

Gour N, Wills-Karp M. Carbohydrate Moieties Contained in Dust Mite Allergen Promote IL-10 Production by Dendritic Cells . American Academy of Allergy, Asthma and Immunology Annual Meeting, San Francisco, CA 2011

Isaac T. W. Harley (2008) Harley I, Divanovic S, Pfluger P, Trompette A, Dunn J, Flick L, Minges C, Allen J, Ashworth J, Pamp S, Weisberg S, Clegg D, Setchell K, Relman D, Flick M, Seeley R, Tschöp M, Karp CL. Defining the Locus of TLR/RP105-mediated protection from Diet-Induced Obesity. UC Physician Scientist Training Program Spring Retreat, Oxford, OH 2011

Sema Kurtulus (2007) Kurtulus S. Additional loss of Bim rescues viral-specific effector and memory T cells, but not endogenous memory T cells or NK cells in IL-15-deficient mice. The American Association of Immunologists Annual Meeting, San Francisco, CA 2011

Kurtulus S. Bcl-2 allows Effector and memory CD8+ T cells to tolerate higher expression of Bim' poster presentation. The American Association of Immunologists Annual Meeting, San Francisco, CA 2011

Rachael A. Mintz-Cole (2007) Mintz-Cole R, Gibson A, Reponen T, Hershey GK. Induction of CD80 and CD86 on APCs after exposure to *Aspergillus versicolor* or *Cladosporium cladosporioides* is correlated with distinct T cell responses. Autumn Immunology Conference, Chicago, IL 2010

James D. Phelan (2006) Phelan JD, Khandanpour C, Horman SR, Gaudreau M, Zhu J, Paul WE, Dührsen U, Grimes HL, Möröy T. Lymphoid malignancies critically require Growth factor independent 1 (Gfi1) for tumor initiation and maintenance. American Society of Hematology, Orlando, FL 2010

Phelan JD, Khandanpour C, Horman SR, Gaudreau M, Zhu J, Paul WE, Dührsen U, Möröy T, Grimes HL. Lymphoid malignancies critically require Growth factor independent 1 (Gfi1) for tumor initiation and maintenance. Cancer Biology Training Consortium, Tucson, AZ 2010

Phelan JD, Khandanpour C, Horman SR, Gaudreau M, Zhu J, Paul WE, Dührsen U, Möröy T, Grimes HL. Lymphoid malignancies critically require Growth factor independent 1 (Gfi1) for tumor initiation and maintenance. Center for Immunological Research Annual Retreat, Loveland, OH 2010

Joni Prasad (2006) Prasad J. Host fibrinogen and the *S. aureus*-encoded procoagulant vWbp are context-dependent determinants of bacterial virulence. American Society of Hematology Conference, Orlando, FL 2010

Prasad J. Host hemostatic factors and the *S. aureus*-encoded procoagulant vWbp are determinants of bacterial virulence. FASEB Proteases in Hemostasis and Vascular Biology Conference, Carefree, AZ 2011

Jana Raynor (2008) Raynor J, Chougnet C, Triphathi P, Silva-Lages C, Sholl A, Fink P, Plas D, Hildeman D. Bim controls regulatory T cell homeostasis. Autumn Immunology Conference, Chicago, IL 2010

Amanda B. Waddell (2007) Waddell A. Colonic eosinophilic inflammation and histopathology in experimental colitis is mediated by Ly6C^{+} CCR2^{+} inflammatory monocyte-derived CCL11 via a STAT-6-independent mechanism. Center for Immunological Research Annual Retreat, Loveland, OH 2010

Waddell A. Colonic eosinophilic inflammation in experimental colitis is mediated by Ly6C^{hi} CCR2^{+} inflammatory monocyte-derived CCL11. Graduate Student Research Forum, University of Cincinnati College of Medicine, Cincinnati, OH 2010

Waddell A. Colonic eosinophilic inflammation in experimental colitis is mediated by Ly6C^{hi} CCR2^{+} inflammatory monocyte-derived CCL11. Digestive Health Center Retreat, Cincinnati Children's Hospital Research Foundation, Cincinnati, OH 2011

Mark L. Webb (2008) Webb M, Dienger K, Wills-Karp M. Allergen-induced CCL20 release from bronchial epithelial cells requires transporter-mediated Cl^{-} export. Autumn Immunology Conference, Chicago, IL 2010

Webb M, Dienger K, Wills-Karp M. Allergen-induced lysosomal CCL20 release from BECs requires ion transporter-mediated Cl^{-} export. American Academy of Allergy, Asthma and Immunology Annual Meeting, San Francisco, CA 2011