

Division Details

Division Data Summary

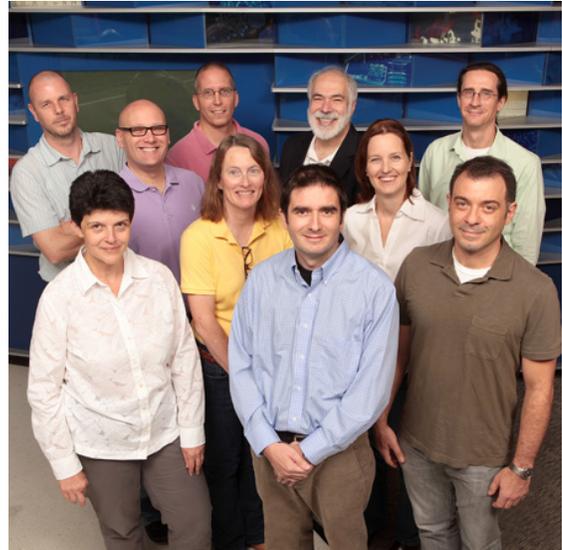
Research and Training Details

Number of Faculty	15
Number of Joint Appointment Faculty	1
Number of Research Fellows	14
Number of Research Students	18
Number of Support Personnel	26
Direct Annual Grant Support	\$4,760,311
Direct Annual Industry Support	\$9,240
Peer Reviewed Publications	46

Clinical Activities and Training

Number of Clinical Staff	0
Number of Clinical Fellows	1

Division Photo



Row 1: C Chougnet, S Divanovic, J Aliberti
Row 2: J Katz, S Morris, E Janssen
Row 3: K Hoebe, D Hildeman, F Finkelman, I Lewkowich

Significant Accomplishments

Understanding asthma pathogenesis

Asthma is the most frequent cause of pediatric emergency room visits in the US and is increasing in frequency. Two studies in the Division used mouse models to increase understanding of asthma pathogenesis. Ian Lewkowich, PhD, and colleagues studied cockroach frass, a particularly important allergen in the inner city (*J Innate Immunity*. 2011. 3: 167-179.). They demonstrated that this allergen promotes the development of asthma by inducing innate immune cells to recruit and activate antigen-presenting myeloid dendritic cells to stimulate CD4⁺ T cells to produce the Th2 and Th17 cytokines that synergistically induce the inflammatory and functional abnormalities characteristic of asthma. Fred Finkelman, MD, and colleagues demonstrated that direct IL-4 and IL-13 effects on airway smooth muscle cells induce a small set of muscle-associated proteins that stimulate the airway hyperresponsiveness to irritating and neural stimulation, the defining characteristic of human asthma (*J. Exp. Med.* 2011. 208:853-67). Both of these observations suggest novel therapeutic interventions.

Treatment of Hemophagocytic lymphohistiocytosis (HLH)

HLH is an infection- and inflammation-associated form of anemia in which hyper-activated macrophages cause anemia by ingesting erythrocytes. This disease, which occurs most frequently in children who have a genetic defect in perforin-mediated killing of infected cells, can be lethal and has been difficult to treat. Michael Jordan and collaborators have now shown that treatment with the anti-lymphocyte monoclonal antibody, alemtuzumab,

can help to control HLH that has been refractory to conventional therapy (*Pediatr Blood Cancer*. 2012, online April 22, 2012).

Pathogenesis of transfusion-related acute lung injury (TRALI)

TRALI, the leading cause of death from blood transfusion in developed countries, can be mediated by antibodies to major histocompatibility antigens in transfused blood products that induce a pulmonary vascular leak syndrome. Fred Finkelman, MD, and colleagues developed a mouse model of this disorder and used it to show that these antibodies cause an ultramicroscopic vascular endothelial lesion by binding to vascular endothelial cells and activating complement. This leads to the production of C5a, which attracts macrophages and monocytes to the lungs and induces them to produce the reactive oxygen intermediates that are the proximate cause of the vascular endothelial damage. This damage induces the disease symptoms by allowing fluid to leak from capillaries into the lungs, causing dyspnea and hypoxemia (*J. Exp. Med.* 2011. 208:2525-44.). These observations should promote the development of better ways to prevent TRALI.

Division Highlights

Regulation of the immune response

Although the immune system is critical for host protection against infection and malignancy, overactive immune responses can lead to life-threatening inflammatory disease. Consequently, several mechanisms have evolved to limit immunity and inflammation; mechanisms that are actively studied by several Division members. Claire Chougnet and colleagues demonstrated that peripheral differentiation of regulatory T cells from other T cells is increased in the setting of chronic infection (*AIDS* 2012. 26: 263-273.). Senad Divanovic and colleagues demonstrated that the tryptophan-catabolizing enzyme, indoleamine 2,3-dioxygenase (IDO), protects against intracellular protozoan infections in addition to its suppressive effects on the immune system and that the balance between host protection vs. inhibition of an anti-parasite response is pathogen-specific (*J Infect Dis*, 2012; 205:152-61 and *Am J Pathol*, 2012;180:2001). Julio Aliberti demonstrated that regulation of immunity and inflammation by lipoxins and tryptophan metabolites is dependent on proteasome degradation of the pro-inflammatory signaling molecule, TRAF-6 (*PLoS One* 2012. 7:e38384.). David Hildeman demonstrated that the death of activated CD8⁺ T cells and generation of memory cells after an invading virus has been eliminated depends on a balance of the pro-apoptotic molecule, Bim, and the anti-apoptotic molecule, Bcl-2, which binds Bim and blocks its effects (*J. Immunol.* 2011. 186:5729-36.). Kasper Hoebe used a genetic approach to show that the molecule, GTPase of immunity-associated protein 5 (Gimap5) is required for optimal development and persistence of regulatory T cells and accomplishes this by inducing members of the Foxo gene family (*J. Immunol.* 2012. 188:146-54.). All of these accomplishments have implications for the development of therapeutic approaches to alternatively reduce inflammatory diseases by promoting regulation or to increase immunity to infection or cancer by limiting regulation.

Ian Lewkowich, PhD

Ian Lewkowich received the 2012 Booberg Award from the American Thoracic Society (ATS) Foundation for the best score on an ATS unrestricted research grant.

Fred Finkelman, MD

Fred Finkelman, who assumed the interim directorship of what is now the Division of Cellular and Molecular Immunology, received the 2011 Middleton Award, an annual award that includes \$150,000 in research funds,

given to a single individual by the U.S. Department of Veterans Affairs for lifetime achievement in laboratory research.

Significant Publications

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

This paper used a mouse model to define the mechanism that causes anemia in hemophagocytic lymphohistiocytosis and some other inflammatory disorders. It was shown that physiologically relevant levels of the cytokine, interferon γ (IFN- γ) act directly on macrophages in vivo to alter endocytosis in a way that causes them to ingest erythrocytes. This, in turn, results in severe anemia. These observations suggest that IFN- γ antagonists may be useful for treatment of hemophagocytic lymphohistiocytosis and related disorders.

Aksoylar HI, Lampe K, Barnes MJ, Plas DR, **Hoebe K**. **Loss of immunological tolerance in Gimap5-deficient mice is associated with loss of Foxo in CD4⁺ T cells.** *J. Immunol.* 188:146-54, 2012.

Mice that have a missense mutation in the GTPase of immunity-associated protein 5 (Gimap5) develop a progressive loss of peripheral lymphocytes and spontaneous colitis, which causes early mortality. Aksoylar and colleagues now showed that CD4⁺ T cells in these mice spontaneously differentiate into cells that are polarized to secrete Th1 and Th17 cytokines and are critically important for the development of colitis. Concomitantly, regulatory T cells become reduced in frequency in the peripheral tissues of these mice and lose the ability to suppress immunity and inflammation. These changes in CD4⁺ T cells are associated with decreased expression of Forkheadbox group O (Foxo) transcription factors, including Foxo1, Foxo3, and Foxo4. Thus, Gimap5 controls inflammation through Foxo transcription factors; manipulation of this pathway may be a novel way to regulate inflammation.

Divanovic S, Sawtell NM, Trompette A, Warning JI, Dias A, Cooper AM, Yap GS, Arditi M, Shimada K, Duhadaway JB, Prendergast GC, Basaraba RJ, Mellor AL, Munn DH, **Aliberti J**, **Karp CL**. **Opposing biological functions of tryptophan catabolizing enzymes during intracellular infection.** *J. Infect. Dis.* 205:152-61, 2012.

The tryptophan-degrading enzyme indoleamine 2,3-dioxygenase (IDO) has been shown to be important in downregulating immunity and inflammation. However, IDO was originally shown to promote immunity to the protozoan parasite, *Toxoplasma gondii*, and other pathogens in vitro by decreasing the availability of tryptophan, an essential amino acid, to these pathogens. Divanovic and colleagues now showed that IDO inhibition during murine toxoplasmosis led to 100% mortality, with increased parasite burdens and no evident effects on the immune response. In contrast, IDO acts in mice infected with the protozoan parasite *Leishmania* to suppress parasite clearance and has no effect on outcome in mice infected with herpes simplex virus type 1. Thus, IDO plays biologically important roles in the host response to diverse intracellular infections, but the dominant nature of this role--antimicrobial or immunoregulatory--is pathogen-specific.

Presicce P, Shaw JM, Miller CJ, Shacklett BL, **Chougnet CA**. **Myeloid dendritic cells isolated from tissues of SIV-infected Rhesus macaques promote the induction of regulatory T cells.** *AIDS.* 26:263-73, 2012.

Regulatory T cells (Tregs) can suppress harmful inflammation and autoimmunity but can also limit protective immunity. Presicce and colleagues found that tissue myeloid dendritic cells (mDCs) from simian immunodeficiency virus (SIV)-infected animals exhibit an enhanced capability to induce Treg and may contribute to the accumulation of Tregs in lymphoid tissues during progressive infection. This may contribute to the inability of the immune system in SIV-infected monkeys to control the disease. In addition, modulation of dendritic cell activity with the aim of influencing Treg frequency may lead to new treatment options for HIV and

strategies for vaccine development.

Strait RT, Hicks W, Barasa N, Mahler A, Khodoun M, Kohl J, Stringer K, Witte D, Van Rooijen N, Susskind BM, **Finkelman FD. MHC class I specific antibody binding to nonhematopoietic cells drives complement activation to induce transfusion related acute lung injury in mice.** *J. Exp. Med.* 208:2525-44, 2011.

This paper demonstrated that the pathogenesis of a mouse model of transfusion-related acute lung injury (TRALI), the leading cause of death from blood transfusion in developed countries, requires the activation of complement by antibody binding to major histocompatibility antigens on vascular endothelial cells, with the production of C5a. C5a attracts and activates blood monocytes, which produce reactive oxygen intermediates that rapidly damage the vascular endothelial cells. The observations suggest complement and anti-oxidant-related strategies for preventing TRALI.

Division Publications

1. Ahrens R, Osterfeld H, Wu D, Chen CY, Arumugam M, Groschwitz K, Strait R, Wang YH, Finkelman FD, Hogan SP. **Intestinal mast cell levels control severity of oral antigen-induced anaphylaxis in mice.** *Am J Pathol.* 2012; 180:1535-46.
2. Aksoylar HI, Lampe K, Barnes MJ, Plas DR, Hoebe K. **Loss of immunological tolerance in Gimap5-deficient mice is associated with loss of Foxo in CD4+ T cells.** *J Immunol.* 2012; 188:146-54.
3. Allen JL, Flick LM, Divanovic S, Jackson SW, Bram R, Rawlings DJ, Finkelman FD, Karp CL. **Cutting edge: regulation of TLR4-driven B cell proliferation by RP105 is not B cell autonomous.** *J Immunol.* 2012; 188:2065-9.
4. Butcher BA, Fox BA, Rommereim LM, Kim SG, Maurer KJ, Yarovinsky F, Herbert DR, Bzik DJ, Denkers EY. **Toxoplasma gondii rhoptry kinase ROP16 activates STAT3 and STAT6 resulting in cytokine inhibition and arginase-1-dependent growth control.** *PLoS Pathog.* 2011; 7:e1002236.
5. Daissormont IT, Christ A, Temmerman L, Sampedro Millares S, Seijkens T, Manca M, Rousch M, Poggi M, Boon L, van der Loos C, Daemen M, Lutgens E, Halvorsen B, Aukrust P, Janssen E, Biessen EA. **Plasmacytoid dendritic cells protect against atherosclerosis by tuning T-cell proliferation and activity.** *Circ Res.* 2011; 109:1387-95.
6. Day SB, Ledford JR, Zhou P, Lewkowich IP, Page K. **German cockroach proteases and protease-activated receptor-2 regulate chemokine production and dendritic cell recruitment.** *J Innate Immun.* 2011; 4:100-10.
7. Deng S, Mattner J, Zang Z, Bai L, Teyton L, Bendelac A, Savage PB. **Impact of sugar stereochemistry on natural killer T cell stimulation by bacterial glycolipids.** *Org Biomol Chem.* 2011; 9:7659-62.
8. Denning TL, Norris BA, Medina-Contreras O, Manicassamy S, Geem D, Madan R, Karp CL, Pulendran B. **Functional specializations of intestinal dendritic cell and macrophage subsets that control Th17 and regulatory T cell responses are dependent on the T cell/APC ratio, source of mouse strain, and regional localization.** *J Immunol.* 2011; 187:733-47.
9. Divanovic S, Sawtell NM, Trompette A, Warning JI, Dias A, Cooper AM, Yap GS, Arditi M, Shimada K, Duhadaway JB, Prendergast GC, Basaraba RJ, Mellor AL, Munn DH, Aliberti J, Karp CL. **Opposing biological functions of tryptophan catabolizing enzymes during intracellular infection.** *J Infect Dis.* 2012; 205:152-61.
10. Divanovic S, Trompette A, Ashworth JI, Rao MB, Karp CL. **Therapeutic enhancement of protective immunity during experimental leishmaniasis.** *PLoS Negl Trop Dis.* 2011; 5:e1316.
11. D'Souza S, del Prete D, Jin S, Sun Q, Huston AJ, Kostov FE, Sammut B, Hong CS, Anderson JL, Patrene KD, Yu S, Velu CS, Xiao G, Grimes HL, Roodman GD, Galson DL. **Gfi1 expressed in bone marrow stromal cells**

- is a novel osteoblast suppressor in patients with multiple myeloma bone disease. *Blood*. 2011; 118:6871-80.
12. Fu CL, Odegaard JI, De'Broski RH, Hsieh MH. **A novel mouse model of Schistosoma haematobium egg-induced immunopathology.** *PLoS Pathog*. 2012; 8:e1002605.
 13. Fusakio ME, Mohammed JP, Laumonnier Y, Hoebe K, Kohl J, Mattner J. **C5a regulates NKT and NK cell functions in sepsis.** *J Immunol*. 2011; 187:5805-12.
 14. Jordan MB, Allen CE, Weitzman S, Filipovich AH, McClain KL. **How I treat hemophagocytic lymphohistiocytosis.** *Blood*. 2011; 118:4041-52.
 15. Kallapur SG, Kramer BW, Knox CL, Berry CA, Collins JJ, Kemp MW, Nitsos I, Polglase GR, Robinson J, Hillman NH, Newnham JP, Chougnet C, Jobe AH. **Chronic fetal exposure to Ureaplasma parvum suppresses innate immune responses in sheep.** *J Immunol*. 2011; 187:2688-95.
 16. Karp CL, Murray PJ. **Non-canonical alternatives: what a macrophage is 4.** *J Exp Med*. 2012; 209:427-31.
 17. Katz JD, Janssen EM. **Breaking T cell tolerance to beta cell antigens by merocytic dendritic cells.** *Cell Mol Life Sci*. 2011; 68:2873-83.
 18. Khodoun MV, Strait R, Armstrong L, Yanase N, Finkelman FD. **Identification of markers that distinguish IgE- from IgG-mediated anaphylaxis.** *Proc Natl Acad Sci U S A*. 2011; 108:12413-8.
 19. Kucuk ZY, Strait R, Khodoun MV, Mahler A, Hogan S, Finkelman FD. **Induction and suppression of allergic diarrhea and systemic anaphylaxis in a murine model of food allergy.** *J Allergy Clin Immunol*. 2012; 129:1343-8.
 20. Lewkowich IP, Day SB, Ledford JR, Zhou P, Dienger K, Wills-Karp M, Page K. **Protease-activated receptor 2 activation of myeloid dendritic cells regulates allergic airway inflammation.** *Respir Res*. 2011; 12:122.
 21. Lykens JE, Terrell CE, Zoller EE, Risma K, Jordan MB. **Perforin is a critical physiologic regulator of T-cell activation.** *Blood*. 2011; 118:618-26.
 22. Marsh RA, Jordan MB, Filipovich AH. **Reduced-intensity conditioning haematopoietic cell transplantation for haemophagocytic lymphohistiocytosis: an important step forward.** *Br J Haematol*. 2011; 154:556-63.
 23. Mohammed JP, Fusakio ME, Rainbow DB, Moule C, Fraser HI, Clark J, Todd JA, Peterson LB, Savage PB, Wills-Karp M, Ridgway WM, Wicker LS, Mattner J. **Identification of Cd101 as a susceptibility gene for Novosphingobium aromaticivorans-induced liver autoimmunity.** *J Immunol*. 2011; 187:337-49.
 24. Moreno-Fernandez ME, Rueda CM, Velilla PA, Rugeles MT, Chougnet CA. **cAMP during HIV infection: friend or foe?** *AIDS Res Hum Retroviruses*. 2012; 28:49-53.
 25. Nierkens S, den Brok MH, Garcia Z, Togher S, Wagenaars J, Wassink M, Boon L, Ruers TJ, Figdor CG, Schoenberger SP, Adema GJ, Janssen EM. **Immune adjuvant efficacy of CpG oligonucleotide in cancer treatment is founded specifically upon TLR9 function in plasmacytoid dendritic cells.** *Cancer Res*. 2011; 71:6428-37.
 26. Presicce P, Shaw JM, Miller CJ, Shacklett BL, Chougnet CA. **Myeloid dendritic cells isolated from tissues of SIV-infected Rhesus macaques promote the induction of regulatory T cells.** *AIDS*. 2012; 26:263-73.
 27. Puntambekar SS, Bergmann CC, Savarin C, Karp CL, Phares TW, Parra GI, Hinton DR, Stohlman SA. **Shifting hierarchies of interleukin-10-producing T cell populations in the central nervous system during acute and persistent viral encephalomyelitis.** *J Virol*. 2011; 85:6702-13.
 28. Rainbow DB, Moule C, Fraser HI, Clark J, Howlett SK, Burren O, Christensen M, Moody V, Steward CA, Mohammed JP, Fusakio ME, Masteller EL, Finger EB, Houchins JP, Naf D, Koentgen F, Ridgway WM, Todd JA, Bluestone JA, Peterson LB, Mattner J, Wicker LS. **Evidence that Cd101 is an autoimmune diabetes gene in nonobese diabetic mice.** *J Immunol*. 2011; 187:325-36.
 29. Ramsey BW, Banks-Schlegel S, Accurso FJ, Boucher RC, Cutting GR, Engelhardt JF, Guggino WB, Karp CL, Knowles MR, Kolls JK, LiPuma JJ, Lynch S, McCray PB, Jr., Rubenstein RC, Singh PK, Sorscher E, Welsh M. **Future directions in early cystic fibrosis lung disease research: an NHLBI workshop report.** *Am J Respir*

Crit Care Med. 2012; 185:887-92.

30. Rani R, Jordan MB, Divanovic S, Herbert DR. **IFN-gamma-driven IDO production from macrophages protects IL-4Ralpha-deficient mice against lethality during *Schistosoma mansoni* infection.** *Am J Pathol.* 2012; 180:2001-8.
31. Rani R, Smulian AG, Greaves DR, Hogan SP, Herbert DR. **TGF-beta limits IL-33 production and promotes the resolution of colitis through regulation of macrophage function.** *Eur J Immunol.* 2011; 41:2000-9.
32. Risma K, Jordan MB. **Hemophagocytic lymphohistiocytosis: updates and evolving concepts.** *Curr Opin Pediatr.* 2012; 24:9-15.
33. Rueda CM, Velilla PA, Chougnet CA, Montoya CJ, Rugeles MT. **HIV-induced T-cell activation/exhaustion in rectal mucosa is controlled only partially by antiretroviral treatment.** *PLoS One.* 2012; 7:e30307.
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37. Sheridan R, Lampe K, Shanmukhappa SK, Putnam P, Keddache M, Divanovic S, Bezerra J, Hoebe K. **Lampe1: an ENU-germline mutation causing spontaneous hepatosteatosis identified through targeted exon-enrichment and next-generation sequencing.** *PLoS One.* 2011; 6:e21979.
38. Strait RT, Hicks W, Barasa N, Mahler A, Khodoun M, Kohl J, Stringer K, Witte D, Van Rooijen N, Susskind BM, Finkelman FD. **MHC class I-specific antibody binding to nonhematopoietic cells drives complement activation to induce transfusion-related acute lung injury in mice.** *J Exp Med.* 2011; 208:2525-44.
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40. Wills-Karp M, Finkelman FD. **Innate lymphoid cells wield a double-edged sword.** *Nat Immunol.* 2011; 12:1025-7.
41. Wills-Karp M, Rani R, Dienger K, Lewkowich I, Fox JG, Perkins C, Lewis L, Finkelman FD, Smith DE, Bryce PJ, Kurt-Jones EA, Wang TC, Sivaprasad U, Hershey GK, Herbert DR. **Trefoil factor 2 rapidly induces interleukin 33 to promote type 2 immunity during allergic asthma and hookworm infection.** *J Exp Med.* 2012; 209:607-22.
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43. Wolkers MC, Bensinger SJ, Green DR, Schoenberger SP, Janssen EM. **Interleukin-2 rescues helpless effector CD8+ T cells by diminishing the susceptibility to TRAIL mediated death.** *Immunol Lett.* 2011; 139:25-32.
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- pathologies in a mouse model of chronic obstructive pulmonary disease.** *J Immunol.* 2012; 188:4468-75.
46. 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 HLH.** *Blood.* 2011; 118:5794-8.

Faculty, Staff, and Trainees

Faculty Members

Christopher Karp, MD, Professor

Leadership Director, Division of Molecular Immunology; Gunnar Esiason/Cincinnati Bell Chair; Director, CF Research Center; Director, Trustee and Procter Scholar Programs; Adjunct, effective March 2012

Research Interests Molecular mechanisms underlying regulation and dysregulation of inflammatory responses in infectious, allergic, and genetic metabolic diseases

Marsha Wills-Karp, PhD, Professor

Leadership Director, Division of Immunobiology; Associate Director of Immunobiology Graduate Program; Rieveschl Professor of Pediatrics; Adjunct, effective March 2012

Research Interests Immunopathogenesis of asthma

Fred Finkelman, MD, Professor

Leadership Interim Director, Division of Cellular and Molecular Immunology; McDonald Professor, UC Department of Internal Medicine, Division of Rheumatology and Immunology

Research Interests Allergy/Asthma, Intestinal Parasites

Julio Aliberti, PhD, Associate Professor

Research Interests Induction and regulation of immune responses to intracellular pathogens

Claire A. Chougnet, PhD, Associate Professor

Research Interests Mechanisms of immune dysregulation in HIV and aging; ontogeny of immune responses in early life

Senad Divanovic, PhD, Assistant Professor

Research Interests Role of the innate immune system in obesity and its sequelae. Role of innate immune system in induction of preterm labor

H. Leighton Grimes, PhD, Associate Professor

Leadership 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

Leadership Director, Immunobiology Graduate Program

Research Interests T-cell Biology

Kasper Hoebe, PhD, Assistant Professor

Research Interests Forward genetic analysis of the host immune response using ENU mutagenesis

Edith M. Janssen, PhD, Assistant Professor

Research Interests Mechanistic analysis and translational exploitation of adaptive immune responses to antigens expressed by apoptotic cells

Michael B. Jordan, MD, Associate Professor

Research Interests Childhood Immunodeficiency Diseases

Joerg Koehl, MD, Adjunct

Research Interests Regulation of innate and adaptive immune responses by the complement system

Ian Lewkowich, PhD, Assistant Professor

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

Jonathan Katz, PhD, Professor (Endocrinology)

Research Interests The immunology of Type 1 Diabetes Mellitus

Trainees

- **Halil Aksoylar, BS**, GSY-5, Middle East Technical University, Ankara, Turkey
- **Nicholas Boespflug, BS**, GSY-3, Seattle University, Seattle, Washington
- **Stacey Burgess, BS**, GSY-4, Marietta College, Marietta, Ohio
- **Monica Cappelletti, PhD**, PGY-1, University of Milan, Milan, Italy
- **Jordan Downey, BS**, GSY-3, Hendrix College, Conway, Arkansas
- **Changhu Du, PhD**, PGY-8, Guangzhou Medical School, Guangzhou, China
- **Maria Moreno Fernandez, BS**, GSY-3, Universidad de Antioquia, Medellin, Antioquia, Colombia
- **Daniel Giles, BS**, GSY-1, Case Western Reserve University, Cleveland, Ohio
- **Naina Gour, BS**, GSY-3, University of Delhi, Delhi, India
- **Isaac Harley, BS**, GSY-4, University of Oklahoma, Norman, Oklahoma
- **Jared Klarquist, BA**, GSY-1, Dartmouth College, Hanover, New Hampshire
- **Sema Kurtulus, BS**, GSY-5, Sabanci University, Istanbul, Turkey
- **Stephane Lajoie, PhD**, PGY-5, McGill University, Montreal, Quebec, Canada
- **Kun-Po Li, MS**, GSY-1, Graduate Institute of Immunology, National Taiwan University, Taiwan
- **Andrew Lindsley, MD, PhD**, PGY-5, Indiana University, Indianapolis, Indiana
- **Jaclyn McAlees, PhD**, PGY-3, The Ohio State University, Columbus, Ohio
- **Cortez McBerry, BS**, GSY-5, Southern Illinois University, Carbondale, Illinois
- **Jonathan McNally, BS**, GSY-3, St. Mary's College, St. Mary's City, Maryland
- **Sara Meyer, PhD**, PGY-3, University of Cincinnati, Cincinnati, Ohio
- **Andre Olsson, PhD**, PGY-6, Lund University, Lund, Sweden
- **James Phelan, BS**, GS-6, The Ohio State University, Columbus, Ohio
- **Supriya Pokkali, PhD**, PGY-4, Tuberculosis Research Center, Chennai, India
- **Pietro Presicce, PhD**, PGY-6, University of Pavia, Pavia, Italy
- **Reena Rani, PhD**, PGY-6, Chhatrapati Shahu Ji Maharaj University, Kanpur, India
- **Jana Raynor, BS**, GS-4, North Georgia College and State University, Dahlonega, Georgia
- **Cesar Rueda Rios, PhD**, PGY-1, Universidad de Antioquia, Medellin, Antioquia, Colombia
- **Rosa Maria Salazar-Gonzalez, PhD**, PGY-3, Emory University, Atlanta, Georgia
- **Hesham Shehata, BA**, GSY-2, Transylvania University, Lexington, Kentucky

- **Sara Stoffers, BS**, GSY-4, University Central Florida, Orlando, Florida
- **Robert Thacker, PhD**, PGY-5, The University of Cincinnati, Cincinnati, Ohio
- **Pulak Tripathi, PhD**, PGY-9, Markey Cancer Center, University of Kentucky, Lexington, Kentucky
- **Chinavenmeni Velu, PhD**, PGY-7, Texas Tech University Medical Center, Amarillo, Texas
- **Mark Webb, BS**, GSY-4, Brigham Young University, Provo, Utah

Division Collaboration

Allergy and Immunology » Simon Hogan, PhD

TGF- β limits IL-33 production and promotes the resolution of colitis through regulation of macrophage function (Herbert)

Allergy and Immunology » Kimberly Risma, MD, PhD

The biology of cytotoxicity: Genotype/phenotype correlations (Jordan)

Allergy and Immunology » Marc Rothenberg, MD, PhD

Advances in mechanisms of asthma, allergy and immunology in 2011 (Finkelman)

IL-13 associated eosinophil lung responses (Grimes)

Allergy and Immunology » Yui-Hsi Wang, PhD

The potential role of interleukin-17 in severe asthma (Wills-Karp)

Allergy and Immunology » Anil Mishra, PhD and Marc Rothenberg, MD, PhD

Induction and activation of invariant natural killer T cells are critical in the pathogenesis of eosinophilic esophagitis (Mattner)

Allergy and Immunology » Ariel Munitz, PhD and Marc Rothenberg, MD, PhD

Resistin-like molecule alpha regulates IL-13-induced chemokine production but not allergen-induced airway responses (Finkelman)

Allergy and Immunology; Emergency Medicine » Z. Yesim Kucuk, MD, Simon Hogan, PhD, and Rick Strait, MD

Induction and suppression of allergic diarrhea and systemic anaphylaxis in a mouse model of food allergy (Finkelman)

Allergy and Immunology; Experimental Hematology and Cancer Biology » Simon Hogan, PhD, Nives

Zimmerman, MD, and Yi Zheng, PhD

Increased susceptibility of 129SvEvBrd mice to IgE- mast cell mediated anaphylaxis (Finkelman)

Asthma Research » Gurjit Khurana Hershey, MD, PhD

Role of allergen-driven epithelial genes in asthma pathogenesis (Wills-Karp)

Asthma Research » Hong Ji, PhD

Human dendritic cell development (Janssen)

Asthma Research; Neonatology and Pulmonary Biology » Gurjit Khurana Hershey, MD, PhD, Umasundari

Sivaprasad, PhD, and Timothy LeCras, PhD

Down-regulation of Glutathione S-transferase Pi in asthma contributes to enhanced oxidative stress (Wills-Karp)

Bone Marrow Transplant and Immune Deficiency » Rebecca Marsh, MD

Immune profiling in Hemophagocytic Lymphohistiocytosis (Jordan)

Cellular and Molecular Immunology » Julio Aliberti, PhD

The role of CD244 and Slp76 in *Toxoplasma gondii* infections (Hoebe)

Cellular and Molecular Immunology » Claire Chougnet, PhD

Effect of aging on merocytic dendritic cells (Janssen)

Assessing host-microbe cross-talk and determine the role of innate immune pathways on pregnancy outcomes (Hoebe)

Cellular and Molecular Immunology » Senad Divanovic, PhD

Obesity driven modulation of immune responses (Janssen)

Characterization of inflammatory pathways driving hepatic steatosis and steatohepatitis in *Acox-1*-deficient mice (Hoebe)

Cellular and Molecular Immunology » Fred Finkelman, MD

Regulation of antibody-mediated disorders (Herbert)

Innate lymphoid cells wield a double-edged sword (Wills-Karp)

Cellular and Molecular Immunology » David Hildeman, PhD

Homeostasis and function of regulatory T cells in aging (Chougnet)

Immune responses to oncolytic viruses (Janssen)

Assessment of NK cells and their role in CD4⁺ T cell responses following LCMV infection (Hoebe)

Control of autoreactive T-cell using small molecule antagonists of BH3 family members (Katz)

Selective ablation of undesirable T cell responses (Jordan)

Cellular and Molecular Immunology » Kasper Hoebe, PhD

Effect of aging on NK function (Chougnet)

Mapping of *Ureaplasma* signaling pathways (Chougnet)

Cellular and Molecular Immunology » Edith Janssen, PhD

Effect of aging on DC function (Chougnet)

Human DC subsets (Chougnet)

Role of Merocytic DC in breaking peripheral T cell tolerance in Type 1 diabetes (Katz)

Cellular and Molecular Immunology » Christopher Karp, MD

Regulation of obesity by RP105, TLRs and Baff (Divanovic)

Regulation of leishmanial infection by IDO, and 5-LO/15-LO (Divanovic)

Cellular and Molecular Immunology » Jochen Mattner, MD

The role of Slp76 and C5AR in NK/NKT cell function (Hoebe)

Identification of Cd101 as a susceptibility gene for *Novosphingobium aromaticivorans* – induced liver autoimmunity (Wills-Karp)

Cellular and Molecular Immunology » Kasper Hoebe, PhD and Joerg Koehl, MD

C5a regulates NKT and NK cell functions in sepsis (Mattner)

Cellular and Molecular Immunology » Michael Jordan, MD and Senad Divanovic, PhD

IFN- γ -drivenIDO production from macrophages protects IL-4Ra-deficient mice against lethality during Schistosoma mansoni infection (Herbert)

Cellular and Molecular Immunology; Asthma Research » Marsha Wills-Karp, PhD, Ian Lewkowich, PhD, Fred Finkelman, MD, Gurjit Khurana Hershey, MD, PhD, and Umasundari Sivaprasad, PhD

Trefoil factor 2 rapidly induces interleukin 33 to promote type 2 immunity during allergic asthma and hookworm infection (Herbert)

Cellular and Molecular Immunology; Critical Care Medicine » Ian Lewkowich, PhD and Kristen Page, PhD

Protease-activated receptor 2 activation of myeloid dendritic cells regulates allergic airway inflammation (Wills-Karp)

Cellular and Molecular Immunology; Emergency Medicine » Joerg Koehl, MD and Rick Strait, MD

MHC class I-specific antibody binding to nonhematopoietic cells drives complement activation to induce transfusion related acute lung injury in mice (Finkelman)

Cellular and Molecular Immunology; Gastroenterology, Hepatology and Nutrition » Christopher Karp, MD, Rohit Kohli, MD, MS, and Stavra Xanthakos, MD, MS

Role of IL-17 axis in NAFLD development and progression (Divanovic)

Cellular and Molecular Immunology; Hematology » Senad Divanovic, PhD and Timothy Cripe, MD

VEGF blockade enables oncolytic cancer virotherapy in part by modulating intratumoral myeloid cells (Hildeman)

Cellular and Molecular Immunology; Pathology » Kasper Hoebe, PhD and Rachel Sheridan, MD

Modeling development and progression of NAFLD (Divanovic)

Cellular and Molecular Immunology; Reproductive Sciences » Christopher Karp, MD, Kasper Hoebe, PhD, Edith Janssen, PhD, and S.K. Dey, PhD

Defining the mechanisms underlying inflammation-driven preterm birth (Divanovic)

Center for Autoimmune Genomics and Etiology (CAGE) » Nan Shen, MD

Dendritic cells in SLE (Janssen)

Critical Care Medicine » Kristen Page, PhD

Dendritic cell-derived tumor necrosis factor α modified airway epithelial cell responses (Lewkowich)

Developmental Biology » Chia-Yi Kuan, MD, PhD

The role of Th17 cells and Th17 cell-derived products in promoting damage in an infection sensitized model of Hypoxic-ischemic induced brain injury (Lewkowich)

Plasminogen activator inhibitor-1 mitigates brain injury in a rat model of infection-sensitized neonatal hypoxia-ischemia (Wills-Karp)

Emergency Medicine » Rick Strait, MD

Identification of markers that distinguish IgE- from IgG- mediated anaphylaxis (Finkelman)

Synergistic induction of a mouse model of TRALI (Finkelman)

Endocrinology » Jonathan Katz, PhD

Diabetes and dendritic cells (Janssen)

Experimental Hematology and Cancer Biology » Jose Cancelas, MD, PhD and Yi Zheng, PhD

Cincinnati Center for Excellence in Molecular Hematology (Chougnet)

Experimental Hematology and Cancer Biology » Marie-Dominique Filippi, PhD and Yi Zheng, PhD

Cdc42 regulates neutrophil migration via crosstalk between WASp, CD11b, and microtubules (Finkelman)

Experimental Hematology and Cancer Biology » Matthew Flick, PhD

The hemostatic protease thrombin in non-alcoholic fatty liver disease pathogenesis (Divanovic)

Experimental Hematology and Cancer Biology » Punam Malik, MD

Novel methods to promote stem cell engraftment (Jordan)

Gene Therapy Resource Program Preclinical Vector Production Core Laboratory (Wills-Karp)

Experimental Hematology and Cancer Biology; Allergy and Immunology » Punam Malik, MD and Kimberly

Risma, MD, PhD

Gene therapy for Hemophagocytic Lymphohistiocytosis (Jordan)

Experimental Hematology and Cancer Biology » James Mulloy, PhD

NSGS Tg mice as a humanized model for in vivo infectious diseases (Aliberti)

Stress hematopoiesis reveals abnormal control of self-renewal, lineage-bias and myeloid differentiation in M11 partial tandem duplication (M11-PTD) hematopoietic stem/progenitor cells (Grimes)

Gastroenterology, Hepatology and Nutrition » Jorge Bezerra, MD

Dysfunction in biliary atresia (Chougnet)

Forward genetic analysis of immune-mediated liver disease using ENU mutagenesis (Hoebe)

Digestive Health Center, Bench to Bedside Research in Pediatrics (Wills-Karp)

Gastroenterology, Hepatology and Nutrition » Ted Denson, MD, PhD

Human IgG-mediated anaphylaxis (Finkelman)

Gastroenterology, Hepatology and Nutrition » Alexander Miethke, MD

Role of regulatory T cells in biliary atresia (Chougnet)

Hematology/Oncology » Joseph Palumbo, MD

The effect of the hemostatic system on T cell responses (Janssen)

Molecular Cardiovascular Biology » Jeffery Molkentin, PhD

Collaboration involves the identification of ENU germline mutants with heart defects (Hoebe)

Neonatology » Alan Jobe, MD, PhD, Paul Kingma, MD, PhD, and Jim Greenberg, MD

Biomarkers of immunologic function and preterm respiratory outcomes (Chougnet)

Neonatology » Suhas Kallapur, MD and Alan Jobe, MD, PhD

Late preterm birth, Ureaplasma species and childhood lung disease (Chougnet)

Ophthalmology » Richard Lang, PhD

The importance of WNT signaling in the formation and growth of human hemangiomas (Lewkowich)

Pediatric and Thoracic Surgery » Gregory Tiao, MD

The molecular determinants of virus induced biliary atresia (Chougnet)

Reproductive Sciences » S.K. Dey, PhD

Regulation of TLR signaling by cannabinoid receptors; regulation of preterm birth by innate immune receptors

(Divanovic)

Rheumatology » John Harley, MD, PhD

Identification of *ATPAF1* as a novel candidate gene for asthma in children (Wills-Karp)

Grants, Contracts, and Industry Agreements

Grant and Contract Awards Annual Direct

ALIBERTI, J

Control of Immune Responses by Lipoxins During Tuberculosis

National Institutes of Health

R01 AI 075038 02/01/08-01/31/13 \$229,432

Long-Term Immunity Against Toxoplasmosis

National Institutes of Health(George Washington University)

R01 AI 033325 07/01/08-06/30/13 \$19,608

CHOUGNET, C

Homeostasis and Function of Regulatory T Cells in Aging

National Institutes of Health

R01 AG 033057 09/15/09-08/31/12 \$65,258

CHOUGNET, C / JOBE, A

Biomarkers of Immunologic Function and Preterm Respiratory Outcomes

National Institutes of Health

U01 HL 101800 05/01/10-04/20/15 \$125,710

DIVANOVIC, S

Better Mouse Models of Disease: Humanizing Experimental Atherosclerosis

National Institutes of Health

R21 HL 113907 04/01/12-03/31/14 \$176,975

FINKELMAN, F (KARP, C)

Allergenicity Resulting from Functional Mimicry of the TLR Complex

National Institutes of Health

R01 AI 088372 03/01/10-02/28/15 \$286,689

GRIMES, L

Gfi-1 and Osteoblast Suppression in Multiple Myeloma

National Institutes of Health(University of Pittsburgh)

R01 AR 059679 07/26/10-06/30/15 \$21,600

MicroRNA in Acute Myeloid Leukemia

National Institutes of Health

R01 CA 159845 07/01/11-04/30/16 \$207,500

HERBERT, D

Alternative Macrophage Activation Limits Immunopathology

National Institutes of Health

R01 GM 083204 09/13/09-07/31/12 \$171,518

Trifol Factors Regulate Th2 Immunity

National Institutes of Health

R01 AI 095289 07/01/11-06/30/16 \$36,013

Regulation of Antibody-Mediated Disorder

National Institutes of Health(University of Cincinnati)

R01 AI 072040 09/12/09-07/31/12 \$11,767

HILDEMAN, D

Regulation of Apoptosis in Activated Primary T Cells

National Institutes of Health

R01 AI 057753 12/01/08-11/30/13 \$254,125

HILDEMAN, D / KATZ, J

Control of Diabetes by Manipulation of Bc12 Family Members

National Institutes of Health

R01 DK 081175 07/01/11-06/30/15 \$125,000

HOEBE, K

Functional Analysis of NK Cells and Their Potential to Generate CTL Responses

National Institutes of Health

R01 AI 074743 07/10/09-06/30/13 \$245,025

HOEBE, K (KARP, C)

Immunobiology of IFRD1, a Gene Modifying CF Lung Disease

National Institutes of Health

R01 HL 094576 08/01/09-07/31/13 \$259,020

Regulation of TLR Signaling and Innate Immunity by RP105

National Institutes of Health

R01 AI 075159 07/01/07-06/30/12 \$240,370

JANSSEN, E

Activating Robust Immunity to Tumor-Associated Antigens: Mechanisms and Biology

National Institutes of Health

R01 CA 138617 04/01/09-02/28/14 \$201,275

JANSSEN, E / KATZ, J

Dendritic Cells in the Breaking of Peripheral Tolerance

National Institutes of Health

R01 DK 090978 09/20/10-08/31/13 \$68,029

JORDAN, M

An Animal Model of Hemophagocytic Lymphohistiocytosis

National Institutes of Health

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

CD8 T Cell Mediated Disruption of Blood Brain Barrier Tight Junction

National Institutes of Health(Mayo Clinic)

R01 NS 060881 09/04/10-07/31/14 \$16,066

Hybrid ImmunoTherapy (ATG/Dexamethasone/Etoposide) for Hemphagocytic Lymphohistiocytosis

National Institutes of Health

R34 HL 107801 03/15/12-02/28/15 \$150,000

KARP, C

Cystic Fibrosis Foundation Research Development Program

Cystic Fibrosis Foundation

07/01/07-06/30/12 \$375,920

Karp, C	Admin/Lipidomics Core	\$125,920
Wells, J	Project 2	\$80,000
Xu, Y	Project 3	\$80,000
Bridges, J	Project 4	\$40,000
Whitsett, J	Core 1	\$50,000

LEWKOWICH, I**Mechanisms of Steroid Resistance in Severe Asthma**

American Thoracic Society

10/01/11-09/30/13

\$40,000

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 Microbial Pathogenesis**

National Institutes of Health

R01 DK 084054

06/01/09-05/31/14

\$171,518

MCALEES, J**Der p 2-driven TLR4 Signaling in Allergic Asthma**

National Institutes of Health

F32 HL 110497

09/01/11-08/31/13

\$53,157

University Research Council Postdoctoral Fellow Research Program

University of Cincinnati

12/01/11-11/30/12

\$5,000

MEYER, S**The Role of Specific MicroRNA Associated with Oncogenics**

Ladies Auxiliary to the Veterans of Foreign War

06/01/11-05/31/13

\$50,000

PHELAN, J**Pelotonia Fellowship Award**

Ohio State University

07/01/11-06/30/12

\$26,000

WILLS-KARP, M**Epithelial Regulation of Th2 Immune Responses in the Lung**

National Institutes of Health

R01 AI 083315

08/20/09-07/31/14

\$245,025

Mechanism of PM Induced Dendritic Cell Activation

National Institutes of Health(The Johns Hopkins University)

P50 ES 015903

09/29/07-06/30/12

\$204,791

Current Year Direct**\$4,760,311****Industry Contracts****JORDAN, M**

Therapure BioPharma, Inc

\$9,240

Total**\$4,769,551****Additional Information****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 Cellular and Molecular Immunology serves as the administrative home of the Graduate Program. The program is governed by Director Dr. David Hildeman, 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 39 faculty members from 5 departments and 12 divisions within the University of Cincinnati College of Medicine and CCHMC. We currently have a total of 39 outstanding students (35 PhD students and 4MS students) from around the country and abroad. This academic year we celebrated the graduation of 3 PhD students and 1 MS students. Our students have distinguished themselves already by receiving several travel and research awards (AAAAI, 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

Student	Faculty Mentor	Admission Year
James Phelan	H. Leighton Grimes	2006
Jill Fritz	Timothy Weaver	2006
Joni Prasad	Jay Degen	2006
Amanda Beichler	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	John Harley	2008
Isaac Harley	Christopher Karp	2008
Jana Raynor	David Hildeman	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	Jonathan Katz	2009
Maria Fields	Claire Chougnnet	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 Chougnnet	2010
Kristina Bielewicz	Non-Thesis MS	2011
Rahul D'Mello	Marc Rothenberg	2011

Lindsay Dunn	Non-Thesis MS	2011
Dan Giles	Senad Divanovic	2011
Mike Horwath	George Deepe	2011
Jared Klarquist	Edith Janssen	2011
Kun-Po Li	David Hildeman	2011
Yuan Li	MS student	2011
Sara Stoffers	Ian Lewkowich	2011
Yi Ting Tsai	Simon Hogan	2011

Student Honors

Olivia Ballard (2010) Travel Award, ISHRML Conference, Trieste, Italy

Rahul D'Mello (2011) Robert Swain Memorial Award, University of Cincinnati College of Medicine, "Transforming the drudgery of medical school into an enjoyable experience for one's classmates"

Maria Fields (2009)

- Ryan Fellowship
- Poster Award 3rd Place, Imaging and Cytometry Research Day, Cincinnati Children's Hospital
- Amnis-EMD Millipore Travel Award, AAI Conference, Boston, Massachusetts

Rachael Mintz (2007) Philanthropic Educational Organization Scholar Award: \$15,000

Mark Webb (2008) Awarded best poster/abstract in its category, Autumn Immunology Conference, Chicago, Illinois, and at the graduate student poster forum at the University of Cincinnati

Student Publications

Ibrahim Aksoylar (2007) - Aksoylar HI, Lampe K, Barnes MJ, Plas DR, Hoebe K. Loss of immunological tolerance in Gimap5-deficient mice is associated with loss of Foxo in CD4+ T cells. *J Immunol.* 188(1):146-54, 2012.

Nicholas Boespflug (2009) - Gadi VK, Nelson JL, Guthrie K, Anderson C, **Boespflug N**, Redinger J, Biswajit P, Dinyari P, Shapiro JAM. Soluble Donor DNA and Islet Injury After Transplantation. *Transplantation* 92(5): 607-611, 2011.

Maria Fields (2009) - Moreno-Fernandez ME, Rueda CM, Velilla PA, Rugeles MT, Chougnet CA. cAMP during HIV infection: friend or foe? *AIDS Res. Hum. Retroviruses* 28(1):49-53, 2012.

Moreno-Fernandez ME, Presicce P, Chougnet CA. Origin and function of regulatory T cells in HIV/SIV infection. In Press, *J Virol.*

Presicce P, **Moreno-Fernandez ME**, Rusie LK, Fichtenbaum C, Chougnet CA. In Vitro HIV Infection Impairs the Capacity of Myeloid Dendritic Cells to Induce Adaptive Regulatory T Cells. In Press, *PLoS One.*

Isaac Harley (2008) - Schauburger EM, Ewart SL, Arshad SH, Huebner M, Karmaus W, Holloway JW, Friderici KH, Ziegler JT, Zhang H, Rose-Zerilli MJ, Barton SJ, Holgate ST, Kilpatrick JR, Harley JB, Lajoie-Kadoch S, **Harley IT**, Hamid Q, Kurukulaaratchy RJ, Seibold MA, Avila PC, Rodriguez-Cintrón 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.* 128(4):753-760.e11, 2011.

Namjou B, Choi CB, **Harley IT**, Alarcón-Riquelme ME, BIOLUPUS Network, Kelly JA, Glenn SB, Ojwang JO, Adler A, Kim K, Gallant CJ, Boackle SA, Criswell LA, Kimberly RP, Brown EE, Edberg J, Alarcón GS, Stevens

AM, Jacob CO, Gilkeson GS, Kamen DL, Tsao BP, Anaya JM, Kim EM, Park SY, Sung YK, Guthridge JM, Merrill JT, Petri M, Ramsey-Goldman R, Vilá LM, Niewold TB, Martin J, Pons-Estel BA, Genoma en Lupus Network, Vyse TJ, Freedman BI, Moser KL, Gaffney PM, Williams AH, Comeau ME, Reveille JD, Kang C, James JA, Scofield RH, Langefeld CD, Kaufman KM, Harley JB, Bae SC. Evaluation of TRAF6 in a large multiancestral lupus cohort. *Arthritis Rheum.* 64(6):1960-9, 2012.

Harley ITW and Karp CL. Obesity and the gut microbiome: Striving for causality. In Press, *Molecular Metabolism* (Elsevier).

Cortez McBerry (2007) - McBerry CM, Gonzalez RM, Shryock N, Dias A, Aliberti J. SOCS2-induced proteasome-dependent TRAF6 degradation: a common anti-inflammatory pathway for control of innate immune responses. *PLoS One* 7(6):e38384, 2012.

McBerry CM, Egan CE, Rani R, Yang Y, Wu D, Boespflug N, Butcher B, Mirpuri J, Hogan SP, Denker EY, Aliberti J, Herbert DR. Trefoil factor 2 negatively regulates Type 1 immunity against *Toxoplasma gondii*. In Press, *J Immunol*.

Jana Raynor (2008) - Raynor J, Lages CS, Shehata H, Hildeman DA, Chougnet CA. Homeostasis and function of regulatory T cells in aging. *Curr Opin Immunol.* 24(4):482-7, 2012.

Hesham Shehata (2010) - Raynor J, Lages CS, **Shehata H**, Hildeman DA, Chougnet CA. Homeostasis and function of regulatory T cells in aging. *Curr Opin Immunol.* 24(4):482-7, 2012.

Sara Stoffers (2011) - Stoffers SL, Meyer SE, Grimes HL. MicroRNAs in the midst of myeloid signal transduction. *J Cell Physiol.* 227(2):525-33, 2012.

Samuel Vaughn (2008) - Vaughn SE, Kottyan LC, Munroe ME, Harley JB. Genetic susceptibility to lupus: the biological basis of genetic risk found in B cell signaling pathways. In Press, *J Leukoc Biol*.

Student Oral Presentations

Kun-Po Li (2011) - IL-17A expression in steroid refractory mice is associated with differential HDAC expression. Autumn Immunology Conference, Chicago, Illinois, 2011.

Cortez McBerry (2007) - Trefoil Factor 2 regulates Type-1 Inflammation to *Toxoplasma gondii*. 16th Annual Woods Hole Immunoparasitology Meeting, Woods Hole, Massachusetts, 2012.

Rachael Mintz-Cole (2007) - Dectin-1 Inhibits Allergic Airway Disease Induced by *Aspergillus versicolor*. Autumn Immunology Conference, Chicago, Illinois, 2011.

Harini Raghu (2009) - Plasminogen mediates both positive and negative effects on disease severity in a mouse model of TNF α -driven arthritis. American Society of Hematology (ASH), San Diego, California, 2011.

Plasminogen mediates both positive and negative effects on TNF α -driven arthritis through fibrinogen-dependent mechanisms. Gordon research seminar on "Plasminogen activation and extracellular proteolysis", Ventura, California, 2012.

Student Poster Presentations

Maria Fields (2009) - Regulatory T cells decreased HIV transmission from DC to conventional T cells. 99th Annual Meeting of the American Association of Immunologists, Boston, Massachusetts, 2012.

Isaac Harley (2008) - Role of IL-17 in the development and progression of non-alcoholic fatty liver disease.

Digestive Health Center Retreat; Cincinnati Diabetes and Obesity Center Retreat, Cincinnati, Ohio; Keystone Symposium Conference on the Microbiome, Keystone, Colorado, 2012.

Regulation of Energy Metabolism and Obesity Development by RP105. Digestive Health Center Retreat; Cincinnati Diabetes and Obesity Center Retreat, Cincinnati, Ohio; Keystone Symposium Conference on the Microbiome, Keystone, Colorado, 2012.

Cortez McBerry (2007) - Innate Immunity: Sensing the Microbes and Damage Signals. PD-1 Signaling Drives Immune-Protective IL-10 production in Naïve Mice. Keystone Symposium, 2012.

Rachael Mintz-Cole (2007) - Dectin-1 Inhibits Allergic Airway Disease Induced by *Aspergillus versicolor*. Autumn Immunology Conference, Chicago, Illinois, 2011.

Dectin-1 Inhibits Allergic Airway Disease Induced by *Aspergillus versicolor*. Graduate Student Forum, University of Cincinnati, 2012.

Harini Raghu (2009) - Plasminogen mediates both positive and negative effects on TNF α -driven arthritis through fibrinogen-dependent mechanisms. Gordon research seminar on "Plasminogen activation and extracellular proteolysis", Ventura, California, 2012.

Mark Webb (2008) - Allergen-induced Chemokine release from secretory lysosomes in bronchial epithelial cells requires chloride/proton exchangers. American Thoracic Society Annual Meeting, San Francisco, California, 2012.

Allergen-induced lysosomal CCL20 release from bronchial epithelial cells requires the chloride transporter CLC-7. Autumn Immunology Conference, Chicago, Illinois, 2011; Graduate Student Poster Forum, University of Cincinnati, Cincinnati, Ohio, 2012.