BIOGRAPHICAL SKETCH

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NAME: Wilson, Eric

eRA COMMONS USER NAME: ERICWILSON

POSITION TITLE: Associate Professor of Microbiology and Molecular Biology

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Utah State University, Logan UT	BS	05/1990	Medical Technology
Utah State University, Logan UT	MS	05/1994	Parasitology
Montana State University, Bozeman MT	Ph.D	05/2000	Immunology
Stanford University, Stanford CA	Post doc	05/2004	Immunology

A. Personal Statement

I have broad training in immunology and have experience studying the immune response in mouse models of disease using a variety of *in vivo* infection models. Specifically, I earned my Ph.D. under the mentorship of Mark Jutila at Montana State University. Completed my postdoctoral training at Stanford University under the direction of Eugene C. Butcher. During my career I have used mouse models to study gastrointestinal diseases using both viral and bacterial pathogens, murine mastitis models using *E. coli* and *S. aureus,* and *S. aureus* skin infection models. While working at a university which is primarily focused on undergraduate teaching, I have built a successful research program having been awarded four NIH grants and one USDA grant. The overriding goal of our research laboratory is to gain a better understanding the immune response to infectious diseases. The main foci of our research is better understand the interactions of host pathogen relationships. Current projects include: 1, defining the role of nutritional immunity during mammary gland infections (host manipulation of metal availability) and 2, Understanding the role of bacterial regulatory systems in influencing neutrophil response in *S. aureus* infections.

My lab is highly collaborative and has published on many diverse topics ranging from immune cell homing and accumulation, chemokine structure function, bacterial metal acquisition, the influence of toxoplasma infection on dementia, characterizing the influence of chemokine receptor alleles in Alzheimer's risk and the description of new parasite species. We currently have active collaborations with Bruce Brown, Shawn Gale and Dawson Hedges in the BYU department of Psychology. David Erickson and Mary Davis in the BYU Microbiology and Molecular Biology Department and Tyler Nygaard and Jovanka Voyich at Montana State University.

Over the past several years my lab has transitioned from a chemokine biology/immunology focused lab to a lab focused on the role of Staphylococcal regulatory systems and their role in altering host immune responses. This transition to a new field has come at a cost in the number of publications during this time. However, our progress in this transition has recently been validated by our receiving a five year NIH R01 grant. To study neutrophil/Staphylococcus interactions.

B. Positions and Honors

Positions and Employment

1994-1999 Graduate Research Assistant, Montana State University
1999-2000 Postdoctoral Scholar, Montana State University
2000-2004 Postdoctoral Fellow, Stanford University (Eugene Butcher Laboratory)
2004-2010 Assistant Professor, Brigham Young University
2010-present Associate Professor, Brigham Young University

Other Experience and Professional Memberships

2004-Present Member, American Association of Immunologists
2010-Present Member, American Society for Microbiology
2013-2014 NIH Scientific Review Group Study Section member
2020-2020 Ad hock reviewer NIH Scientific Review Group

Honors

2012-2014 **Alcuin Fellowship.** Brigham Young University employees ~1,500 full time faculty. The Alcuin Fellowship is awarded to between 1-5 faculty members each year for excellence in teaching general education (GE) courses.

2016-2019 **University General Education Professorship**. Brigham Young University employees ~1,500 full time faculty. The General Education Professorship is awarded to a single professor each year. This award is given for "excellence in enriching and enlivening the experience of undergraduate students" at Brigham Young University.

C. Contributions to Science

Recent publications

- Craft, J, Eddington A, Christman N, Pryor W, Chaston JM, Erickson DL, **Wilson E**. 2022 Increased microbial diversity and decreased prevalence of common pathogens in the gut microbiomes of wild turkeys compared to domestic turkeys. *Applied and Environmental Microbiology* 2022. Jan. 19
- Olson MS, Grimsrud A, Richards AC, Mulvey MA, **Wilson E**, Erickson DL **2021.** Bile Salts Regulate Zinc Uptake and Capsule Synthesis in a Mastitis-Associated Extraintestinal Pathogenic Escherichia coli Strain. *Infection and Immunity* 2021 Sep. 16.

We are a highly collaborative lab. However, our steadfast focus remains on understanding the immune response in mouse models. My major research accomplishments include publishing the first demonstration of the role of the chemokine CCL28 in mediating lymphocyte migration *in vivo*. In this paper we demonstrated the indispensable nature of this chemokine in mediating lymphocyte homing to the lactating mammary gland and mediating immune transfer to the nursing neonate. This paper has been highly cited and was highlighted in *Faculty of 1000*. In other related work, my lab identified the vascular adhesion molecules necessary for efficient homing of IgA ASC to the lactating mammary gland.

- **Wilson**, **E**. Butcher E.C. **2004**. CCL28 controls immunoglobulin (Ig)A plasma cell accumulation in the lactating mammary gland and IgA antibody transfer to the neonate, *J Exp. Med.* 200:805-809.
- Low, E. Martino, B. Zagieboylo, L. and **Wilson, E**. **2010**. IgA ASC Accumulation to The Lactating Mammary Gland is Dependent on VCAM-1 and alpha4 Integrins. *Molecular Immunol*. 47:1608-12
- Lazarus, N.H. Kunkel, E.J. Johnston, B. **Wilson, E**. Youngman, K.R, Butcher, E.C. **2003**. A common mucosal chemokine (MEC/CCL28) selectively attracts IgA plasmablasts. *J. Immunol*. 170:3799-3805
- Pallister, K. Mason, S. Nygaard, T. Liu, B. Griffith, S. Jones, J. Linderman, S. Hughes, M. Erickson, D. Voyich, J. and **Wilson E**. 2015. Bovine CCL28 mediates chemotaxis via CCR10 and demonstrates direct antimicrobial activity against mastitis causing bacteria. PLoS One. 2015 Sep 11.

My lab was the first to definitively demonstrate of the role of the CCR10 chemokine receptor in mediating *in vivo* lymphocyte accumulation to mucosal tissues.

- Morteau, O. Gerard, C. Lu, B. Ghiran, S. Rits, M. Fujiwara, Y. Law, Y. Distelhorst, K. Nielsen, E.M. Hill, E.D. Kwan, R. Lazarus, N.H. Butcher, E.C. **Wilson, E. 2008**. An Indispensable Role for the Chemokine Receptor CCR10 in IgA Antibody Secreting Cell Accumulation. *J. Immunol.* 181:6309-15.

My early immunology research was focused on the study of γδ T cells. In this work I developed a novel assay to measure the upregulation of integrin function on γδ T cells following chemokine stimulation. Additionally, using a bovine model I was involved in the initial characterization of a novel adhesion molecule.

- **Wilson, E**. Hedges, J.F. Butcher, E.C. Briskin, M. Jutila, M.A. 2002. Bovine γδ T cell subsets express distinct patterns of chemokine responsiveness and adhesion molecules: a mechanism for tissue-specific γδ T cell subset accumulation. *J. Immunol*. 169:4970-4975.
- **Wilson, E**. Aydintug, K. Jutila, M.A. 1999. A circulating bovine γδ T cell subset, which is found in large numbers in the spleen accumulate inefficiently in an artificial site of inflammation: correlation with lack of expression of E-selectin ligands and L-selectin. *J. Immunol.* 162:4914-4919.
- Jutila, M.A. **Wilson, E**. Kurk, S. **1997**. Characterization of an adhesion molecule that mediates leukocyte rolling on 24h cytokine- or lipopolysaccharide-stimulated bovine endothelial cells under flow conditions. *J Exp. Med*. 186:1701-1711.

I have a strong record of collaboration, having established effective collaborations with researchers in a variety of areas which have resulted in recent publications. In each of these collaborations I have served a role in designing, and advising on, experiments dealing with various aspects of the immune system.

Selected publications from collaborative projects

- Gonzales, JD. Weinert, A. Tellez, CM. Arens, DK. Ferrel, MN. Grose, JH. Ridge, PG. Wilson, E. Kauwe, JSK. Weber SK. **2020**. Atypical chemokine receptor ACKR2-V41A has decreased CCL2 binding, scavenging, and activation, supporting sustained inflammation and increased Alzheimer's disease risk. Scientific Reports. PMID: 32415244
- Wyman CP, Gale SD, Hedges-Muncy A, Erickson LD, Wilson E, Hedges DW. **2017**. Association between *Toxoplasma gondii* seropositivity and memory function in nondemented older adults. Neurobiol Aging. PMID: 28235681.
- Olsen, D. Goar, W. Nichols, B. Bailey, T. Christensen, L. Merriam, K. Reynolds, P. **Wilson**, E. Weber, S. and Bridgewater, L. **2015**. Targeted mutation of nuclear bone morphogenetic protein 2 (nBMP2) impairs secondary immune response in a mouse model. *BioMed Research International*. Article ID 975789.
- Perry, CE. Gale, SD. Erickson, L. **Wilson, E**. Nielsen, B. Kauwe, J. Hedges, D. **2015.** Seroprevalence and Serointensity of Latent *Toxoplasma gondii* in a Sample of Elderly Adults with and without Alzheimer 's Disease. *Alzheimer Disease and Associated Disorders.* In Press.

A complete list of publications is available at:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1n1nvszlz-uAC/bibliography/48935510/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

2020-2025 **Role: Co-Principal Investigator** (with Tyler Nygaard and Jovanka Voyich)
NIH # 1R01AI149491-01A1 Funding $3,065,930 total ($722,400 to Wilson lab)
Title: Defining SaeR/S-dependent Neutrophil-*S. aureus* Interactions that Determine the Outcome of Infection. The goal of this project is to better understand the influences of the saeR/S regulatory system in influencing neutrophil responses to *S. aureus* infections.

Relevant past funding

2012-2016 **Role: Co-Principal Investigator** (with Dr. David Erickson)
NIH# 1R15AI1958-01
Title: Identification of Bacterial Resistance Mechanisms to Antimicrobial Chemokines
The goal of his study is to understand the role of the rfaD operon of *Yersinia pseudotuberculosis* and define the role of the gene products resulting from this operon in mediating bacterial evasion of host antimicrobial peptides.

2011-2015 **Role: Principal Investigator**
NIH # 2R15AI072769-02A1
Title: IgA ASC Homing to Mucosal Tissues
The goal of his project was to elucidate differences in the homing and accumulation mechanisms utilized by mucosal tissues with the goal of upregulating appropriate adhesion molecules to enhance IgA ASC accumulation to select tissues.

2008-2011 **Role: Co-Principal Investigator (with Dr. Jovanka Voyich)**
USDA # 35204-04623
Title: Expression and Function of Bovine CCL28"
The goal of this project was to characterize the expression and function of bovine CCR10 and CCL28 in mediating homing to mucosal sites.

2007-2010 **Role: Principal Investigator**
NIH# 1R15AI072769-01
Title: IgA ASC Homing to Mucosal Tissues
The goal of this project was to investigate the role of the CCR10 chemokine receptor and its ligands in mediating homing to mucosal sites.

Student involvement in peer reviewed research

Our lab has a history of having undergraduate students produce high quality research which earns them authorship on peer reviewed publications. Several undergraduate students from my lab have earned authorship on work published by our lab. **Undergraduate students, mentored in my laboratory have earned co-authorship on published manuscripts 15 times.** Additionally, undergraduate students mentored in my laboratory have earned first author status on 4 peer reviewed publications. These include Rich Davis and Trenden Flanigan (co first authors 2013), Elizabeth Low (first author 2010) and Katie Distelhorst (first author 2010).

Impact of Previous Mentoring

I am dedicated to providing an excellent mentoring environment in my laboratory and am proud of the accomplishments of my current and former students. **I feel the effective mentoring environment of my laboratory is evidenced by the accomplishments of my students after they leave my laboratory.** Many students mentored in my laboratory have been accepted to top rated professional and graduate programs.
Students mentored in my laboratory have gone on to graduate programs at top rated programs including Vanderbilt (Mary Davis), Washington University in St. Lewis (Cameron Sargent), Emory (Erick Christensen and Katie Distelhorst), and the University of Pennsylvania (Susi Linderman), Virginia Commonwealth University (Joel Mathews), University of Vermont (Jennie Sam Hyde) and the University of Arizona (Krysta Felix). Lastly, 12 students mentored in my laboratory have been accepted to medical school and four accepted to dental school.