

BRIAN A. ZABEL, PHD

Principal Investigator/Senior Research Scientist
Palo Alto Veterans Institute for Research (PAVIR)
Veterans Affairs Palo Alto Health Care Research System (VAPAHCS)
m/c 154F, 3801 Miranda Ave, Palo Alto, CA 94304
Office: Bldg 4 Room B206, (ph): 650-493-5000 x69207, (fax): 650-858-3986
Lab: Bldg 101, Room C4-121, (ph): 650-493-5000 x63132
Email: bazabel@alum.mit.edu Website: zabellab.com

EDUCATION

6/04 **Stanford University**, Stanford, CA
PhD in Immunology
6/97 **Massachusetts Institute of Technology**, Cambridge, MA
BS in Biology (minor in Chemistry)
BS in Mathematics (minor Writing)

PROFESSIONAL EXPERIENCE

3/11 - present Principal Investigator / Senior Research Scientist, Palo Alto Veterans Institute for Research (PAVIR), CA
7/09 - 2/11 Principal Investigator / Research Scientist, PAVIR, CA
3/08 - 8/10 Scientist, ChemoCentryx, Inc., Mountain View, CA
9/07 - 6/09 Research Scientist, PAVIR, CA
6/04 - 9/07 Postdoctoral Fellow, Department of Pathology, Stanford University
9/99 - 6/04 Graduate Student, Immunology Program, Stanford University
10/97 - 9/99 Scientist, Department of Immunology, LeukoSite, Inc., Cambridge, MA
6/97 - 10/97 Intern, Preclinical Biology, Genetics Institute, Inc., Andover, MA
9/93 - 6/97 Undergraduate Research Student, Division of Toxicology, MIT, Cambridge, MA

FUNDING

Current

1/15 – 7/15 **Rogne, Inc. Industry Sponsored Research Project**
(Zabel, PI)
1/15 – 12/19 **Polish National Science Centre / Symfonia**
“The role of antimicrobial chemerin in skin biology”
(Zabel, US Partner)
11/14 – 5/16 **DoD / CDMRP**
“Targeting the Nociceptin/Orphanin FQ Receptor for Scleroderma Therapy”
Grant# PR131037 (Zabel, PI)
The goal of this project is to test the hypothesis that distinct partial agonists for NOPR will limit macrophage migration and vasculopathy in vitro and improve scleroderma in a preclinical mouse disease model.
4/13 – 3/18 **R01 NIH / NCI**
“Chemerin in Tumor Immunity and Surveillance”
Grant # CA169354 (Zabel, Co-I)
This project will characterize the role of chemerin in immune surveillance and tumor immunity.
8/14 – 7/15 **LakePharma, Inc. Industry Sponsored Research Project**
(Zabel, PI)
8/14 – 7/16 **Pulmonary Fibrosis Foundation**
“Role of Chemerin and its Receptors in TGF-beta-induced Experimental Pulmonary Fibrosis”
(Zabel, PI)
This project will test the hypothesis that chemerin and its receptors play a protective role in lung fibrosis by recruiting anti-fibrotic leukocytes.

- 7/09 – 6/15 **R01 NIH / NIAID**
 “Molecular and Functional Characterization of Chemerin Receptors”
 Grant # AI079320 (Zabel, PI)
 This grant funds in vitro and in vivo studies of the biology of the chemerin receptors CMKLR1 and CCRL2, with a focus on the roles of the receptors in autoimmune disease.
- 8/11 – 8/15 **DoD / CDMRP**
 “Targeting Chemerin Receptor CMKLR1 in Multiple Sclerosis”
 Grant # W81XWH-11-1-0512 (Zabel, PI)
 The overall goal of this idea award is to identify small molecule antagonists of CMKLR1 and to recapitulate the reduced EAE phenotype of CMKLR1 KO mice with these novel pharmacological agents.
- Completed**
 3/12 – 3/14 **NIH / NIAID**
 Research Supplement to Promote Diversity in Health-Related Research
 Grant# AI079320-03S1 (Zabel, PI)
 This award provided salary support for Mr. Thomas Burke to study the role of the chemerin receptors in experimental autoimmune encephalomyelitis.
- 8/10 – 8/11 **NIH / NIAID ARRA**
 Research Supplement to Promote Diversity in Health-Related Research
 Grant# AI079320-02S1 (Zabel, PI)
 This award provided salary support for Dr. Kareem Graham to study the role of the chemerin receptors in experimental autoimmune encephalomyelitis.
- 7/09 – 5/10 **Stanford University, NIH ARRA Digestive Disease Center Pilot Award**
 “The Role of Chemerin Receptor CCRL2 in IgE-mediated Food Allergy”
 (Zabel, PI)
 This pilot award funded the investigation of the role of chemoattractant receptor CCRL2 in a model of acute peanut-induced anaphylaxis in mice.
- 1/09 – 1/10 **Stanford University SPARK Award**
 “Identifying Small Molecule Antagonists of Chemerin Receptors”
 (Zabel, Co-PI)
 This award supported the development of screens to identify small molecules that bind to chemerin receptors CMKLR1 and CCRL2.

CURRENT LAB MEMBERS AND FUNDING

Melissa LaJevic, PhD	National Science Foundation
Nicole Salazar, PhD	Zabel lab grants
Susanna Lewen, MS	Research Associate II, PAVIR
Ashlee Zheng, MA	Research Assistant I, PAVIR

FORMER STUDENTS/FELLOWS AND CURRENT POSITIONS

Justin Monnier, PhD	Scientist, Bayer
Cecilia Oderup, PhD	Senior Scientist, Pfizer/Rinat
Kareem Graham, PhD	Assistant Professor, Department of Physiology Emory University School of Medicine, Atlanta, GA
Jian Zhang, PhD, DVM	Professor Shenzhen Institutes of Advanced Technology, Shenzhen, China
Ryan Huss, MD	Resident, Stanford University School of Medicine (HHMI Fellow)
Thomas Burke, BS	MSTP Program, Baylor College of Medicine
Jeffrey Carlson, BA	Graduate Student, Baylor College of Medicine
Andrew Jang, BA	Research Associate, Signosis
Celena Garcia	Undergraduate, Rutgers

Kristie Taguma	Undergraduate, UCLA
Kathryn Wong	Undergraduate, UC Berkeley (Regents' Fellow; SIMR Program-- Jessica Saal award recipient)
Alena Rott	Undergraduate, Stanford University
Julia Gross	Undergraduate, Brown University (SIMR Program-- Jessica Saal Award nominee)

TEACHING AND MENTORING EXPERIENCE

PAVIR/VAPAHCS, 2007- present

- Recruited and mentor(ed) three postdoctoral fellows
- Hired and manage(d) five research associates
- Mentored a recent graduate of San Jose State University, undergraduate students from UCLA, UC Berkeley, Stanford University, Rutgers, Brown university, and two Stanford SIMR students
- Mentored a Stanford University Medical student for three years

ChemoCentryx, Inc., 2008-2010

- Managed and trained a research associate

Stanford University, 2000- 2014

- Organized and taught a course on Chemokine:Receptor Biology (Eugene Butcher, faculty sponsor)
- Teaching Assistant for Undergraduate Immunology (Prof. Pat Jones)
- Teaching Assistant for Introduction to Medicine (Prof. Betsy Mellins)
- Invited lecturer for CCIS Summer Research Program on stem cells (5 summers; also wrote book chapter for course); mentored three high school summer students
- Invited lecturer for graduate/medical school course, Technological Frontiers of Digestive Diseases
- Invited lecturer for a graduate school course, Translational Immunology (Imm 209)
- Mentored two graduate students, an undergraduate honors thesis student, and two additional undergraduates sponsored by research awards (Butcher Lab, Stanford University)

LeukoSite, Inc., 1997-1999

- Mentored a Co-Op student from Northeastern University for one year.

Massachusetts Institute of Technology, 1996-1997.

- Teaching Assistant, 6.270 Autonomous Robot Design.
- Mentored two undergraduate students for one academic year each (Schauer Lab).

LOCAL/NATIONAL/INTERNATIONAL SERVICE AND PROFESSIONAL MEMBERSHIPS

3/12 - present	Institutional Animal Care and Use Committee (IACUC) Chairperson, VA Palo Alto Health Care System (VAPAHCS), CA
9/09 - present	American Association of Immunologists Member, Bethesda, MD
8/09 - present	Digestive Disease Center Member, Stanford University
10/14	Ad Hoc Reviewer <i>Polish National Science Centre</i>
8/14	International Space Life Sciences Immunology Study Section Panel Member, NASA
1/14 - 6/14	Veterinary Medical Officer Search Committee Member, VAPAHCS
1/12 – 1/13	Federation of Clinical Immunology Societies Member, Milwaukee, WI
2/11	Organizer, Chemerin Research Mini-Symposium, VAPAHCS
6/10	Root Cause Analysis Team Member, VAPAHCS
6/09 - 2/12	IACUC Member, VAPAHCS, CA

1/07	Ad Hoc Reviewer <i>Wellcome Trust</i>
1/07 - present	Ad Hoc Reviewer <i>Journal of Pathology, European Journal of Immunology, European Journal of Clinical Investigation, Clinical and Experimental Immunology, Immunology Letters, Minireviews in Medicinal Chemistry, Journal of Vascular Research, Regulatory Peptides, Molecular Cancer, Journal of Translational Medicine, Drug Target Insights, Journal of Biomedicine and Biotechnology, Hormone and Metabolic Research, Acta Pharmacologica Sinica, Rheumatology International</i>
1/03	Stanford University Immunology Program Graduate School Admissions Committee Member

U.S. PATENTS AND COMMERCIALIZED TECHNOLOGIES

1. **#8,038,992** "Novel Target for Regulating Multiple Sclerosis" by Graham KL, **Zabel BA**, Butcher EC, October 2011.
2. **#7,485,301** "Methods of Treating Inflammatory Disease Using Antibodies Which Bind GPR-9-6" by Andrew DP, **Zabel BA**, and Ponath PD, February 2009.
3. **#7,381,412** "Anti-TECK Antibodies and Methods of Use Therefor" by Andrew DP, **Zabel BA**, and Ponath PD, June 2008.
4. **#6,936,248** "Methods of Inhibiting GPR-9-6 Function" by Andrew DP, **Zabel BA**, and Ponath PD, August 2005.
5. **#6,884,574** "Methods of Identifying Agents Which Inhibit GPR-9-6" by Andrew DP, **Zabel BA**, and Ponath PD, April 2005.
6. **#6,689,570** "Methods of Identifying Agents Which Bind GPR-9-6" by Andrew DP, **Zabel BA**, and Ponath PD, February 2004.
7. **#6,329,159** "Anti-GPR-9-6 Antibodies and Methods of Identifying Agents That Modulate GPR-9-6 Function," by Andrew DP, **Zabel BA**, and Ponath PD, December 2001.
8. Anti-human CMKLR1 monoclonal antibody BZ332, anti-mouse CMKLR1 monoclonal antibody BZ194, and anti-mouse CCRL2 monoclonal antibody BZ2E3 licensed and sold by multiple biomedical reagent distributors.

PEER-REVIEWED PUBLICATIONS

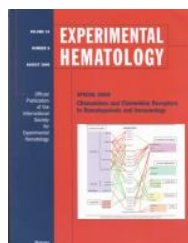
1. Banas M, Zegar A, Kwitniewski M, Zabieglo K, Marczyńska J, Kapinska-Mrowiecka M, LaJevic M, **Zabel BA**, Cichy J. The expression and regulation of chemerin in the epidermis. **PLoS One**. 2015 *In press*.
2. Pachynski RK, **Zabel BA**, Scholz A, Monnier J, Butcher EC. Evaluation of tumor-infiltrating leukocyte subsets in a subcutaneous tumor model. **JoVE**. 2014. *In press*.
3. Graham KL, Zhang JV, Lewen S, Burke TM, Dang T, Zoudilova M, Sobel RA, Butcher EC, **Zabel BA**. A Novel CMKLR1 Small Molecule Antagonist Suppresses CNS Autoimmune Inflammatory Disease. **PLoS One**. 2014; 9(12):e112925. PMID: PMC4249827.
4. Tu H, Burke TM, Oderup C, Huang K, Wong K, Lewen S, LaJevic M, **Zabel BA**. Robust expansion of dendritic cells in vivo by hydrodynamic FLT3L-FC gene transfer. **J Immunol Methods**. 2014; 413:69-73. PMID: PMC4253009.
5. Monnier J, **Zabel BA**. Anti-asialo GM1 NK cell depleting antibody does not alter the development of bleomycin induced pulmonary fibrosis. **PLoS One**. 2014;9(6):e99350. PMID: 4055641.
6. Li L, Ma P, Huang C, Liu Y, Zhang Y, Gao C, Xiao T, Ren PG, **Zabel BA**, Zhang JV. Expression of chemerin and its receptors in rat testes and its action on testosterone secretion. **J Endocrinol**. 2014;220(2):155-63. PMID: 3932185.
7. Li L, Huang C, Zhang X, Wang J, Ma P, Liu Y, Xiao T, **Zabel BA**, Zhang JV. Chemerin-derived peptide C-20 suppressed gonadal steroidogenesis. **Am J Reprod Immunol**. 2014;71(3):265-77. PMID: 4092037.
8. Lee HY, Kim SD, Baek SH, Choi JH, Cho KH, **Zabel BA**, Bae YS. Serum amyloid A stimulates macrophage foam cell formation via lectin-like oxidized low-density lipoprotein receptor 1 upregulation. **Biochem Biophys Res Commun**. 2013;433(1):18-23. PMID: 3670953.

9. Berahovich RD, **Zabel BA**, Lewen S, Walters MJ, Ebsworth K, Wang Y, Jaen JC, Schall TJ. Endothelial Expression of CXCR7 and the Regulation of Systemic CXCL12 Levels. **Immunology**. 2013.
10. Banas M, Zabieglo K, Kasetty G, Kapinska-Mrowiecka M, Borowczyk J, Drukala J, Murzyn K, **Zabel BA**, Butcher EC, Schroeder JM, Schmidtchen A, Cichy J. Chemerin is an antimicrobial agent in human epidermis. **PLoS One**. 2013;8(3):e58709. PMID: 3604073.
11. Pachynski RK, **Zabel BA**, Kohrt HE, Tejada NM, Monnier J, Swanson CD, Holzer AK, Gentles AJ, Sperinde GV, Edalati A, Hadeiba HA, Alizadeh AA, Butcher EC. The chemoattractant chemerin suppresses melanoma by recruiting natural killer cell antitumor defenses. **J Exp Med**. 2012;209(8):1427-35. PMID: 3409495.
12. Monnier J, Lewen S, O'Hara E, Huang K, Tu H, Butcher EC, **Zabel BA**. Expression, regulation, and function of atypical chemerin receptor CCRL2 on endothelial cells. **J Immunol**. 2012;189(2):956-67. PMID: 3428203.
13. Kim SD, Lee HY, Shim JW, Kim HJ, Baek SH, **Zabel BA**, Bae YS. A WKYMVm-containing combination elicits potent anti-tumor activity in heterotopic cancer animal model. **PLoS One**. 2012;7(1):e30522. PMID: 3266298.
14. Kim SD, Kim HJ, Shim JW, Lee HY, Lee SK, Kwon S, Jung YS, Baek SH, Park JS, **Zabel BA**, Bae YS. Phospholipase C activator m-3M3FBS protects against morbidity and mortality associated with sepsis. **J Immunol**. 2012;189(4):2000-5.
15. Issa ME, Muruganandan S, Ernst MC, Parlee SD, **Zabel BA**, Butcher EC, Sinal CJ, Goralski KB. Chemokine-like receptor 1 regulates skeletal muscle cell myogenesis. **Am J Physiol Cell Physiol**. 2012;302(11):C1621-31. PMID: 3378017.
16. Ernst MC, Haidl ID, Zuniga LA, Dranse HJ, Rourke JL, **Zabel BA**, Butcher EC, Sinal CJ. Disruption of the chemokine-like receptor-1 (CMKLR1) gene is associated with reduced adiposity and glucose intolerance. **Endocrinology**. 2012;153(2):672-82. PMID: 3275396.
17. **Zabel BA**, Lewen S, Berahovich RD, Jaen JC, Schall TJ. The novel chemokine receptor CXCR7 regulates trans-endothelial migration of cancer cells. **Mol Cancer**. 2011;10:73. PMID: 3123309.
18. Kulig P, Kantyka T, **Zabel BA***, Banas M, Chyra A, Stefanska A, Tu H, Allen SJ, Handel TM, Kozik A, Potempa J, Butcher EC, Cichy J. Regulation of chemerin chemoattractant and antibacterial activity by human cysteine cathepsins. **J Immunol**. 2011;187(3):1403-10. PMID: 3140563. *co-first author.
19. Kim SD, Lee HY, Shim JW, Kim HJ, Yoo YH, Park JS, Baek SH, **Zabel BA**, Bae YS. Activation of CXCR2 by extracellular matrix degradation product acetylated Pro-Gly-Pro has therapeutic effects against sepsis. **Am J Respir Crit Care Med**. 2011;184(2):243-51.
20. **Zabel BA**, Miao Z, Lai NL, Wang Y, Lewen S, Berahovich RD, Jaen JC, Schall TJ. CXCR7 protein expression correlates with elevated mmp-3 secretion in breast cancer cells. **Oncol Lett**. 2010;1(5):845-7. PMID: 3436257.
21. Huss RS, Huddleston JI, Goodman SB, Butcher EC, **Zabel BA**. Synovial tissue-infiltrating natural killer cells in osteoarthritis and periprosthetic inflammation. **Arthritis Rheum**. 2010;62(12):3799-805. PMID: 2995813.
22. Berahovich RD, **Zabel BA**, Penfold ME, Lewen S, Wang Y, Miao Z, Gan L, Pereda J, Dias J, Slukvin, II, McGrath KE, Jaen JC, Schall TJ. CXCR7 protein is not expressed on human or mouse leukocytes. **J Immunol**. 2010;185(9):5130-9.
23. **Zabel BA**, Wang Y, Lewen S, Berahovich RD, Penfold ME, Zhang P, Powers J, Summers BC, Miao Z, Zhao B, Jalili A, Janowska-Wieczorek A, Jaen JC, Schall TJ. Elucidation of CXCR7-mediated signaling events and inhibition of CXCR4-mediated tumor cell transendothelial migration by CXCR7 ligands. **J Immunol**. 2009;183(5):3204-11.
24. Skrzeczynska-Moncznik J, Wawro K, Stefanska A, Oleszycka E, Kulig P, **Zabel BA**, Sulkowski M, Kapinska-Mrowiecka M, Czubak-Macugowska M, Butcher EC, Cichy J. Potential role of chemerin in recruitment of plasmacytoid dendritic cells to diseased skin. **Biochem Biophys Res Commun**. 2009;380(2):323-7.
25. Skrzeczynska-Moncznik J, Stefanska A, **Zabel BA**, Kapinska-Mrowiecka M, Butcher EC, Cichy J. Chemerin and the recruitment of NK cells to diseased skin. **Acta Biochim Pol**. 2009;56(2):355-60.

26. Graham KL, **Zabel BA**, Loghavi S, Zuniga LA, Ho PP, Sobel RA, Butcher EC. Chemokine-like receptor-1 expression by central nervous system-infiltrating leukocytes and involvement in a model of autoimmune demyelinating disease. **J Immunol.** 2009;183(10):6717-23. PMID: 2904075.
27. Du XY, **Zabel BA**, Myles T, Allen SJ, Handel TM, Lee PP, Butcher EC, Leung LL. Regulation of chemerin bioactivity by plasma carboxypeptidase N, carboxypeptidase B (activated thrombin-activable fibrinolysis inhibitor), and platelets. **J Biol Chem.** 2009;284(2):751-8. PMID: 2613638.
28. **Zabel BA**, Nakae S, Zuniga L, Kim JY, Ohyama T, Alt C, Pan J, Suto H, Soler D, Allen SJ, Handel TM, Song CH, Galli SJ, Butcher EC. Mast cell-expressed orphan receptor CCRL2 binds chemerin and is required for optimal induction of IgE-mediated passive cutaneous anaphylaxis. **J Exp Med.** 2008;205(10):2207-20. PMID: 2556791.
29. Kulig P, **Zabel BA***, Dubin G, Allen SJ, Ohyama T, Potempa J, Handel TM, Butcher EC, Cichy J. Staphylococcus aureus-derived staphopain B, a potent cysteine protease activator of plasma chemerin. **J Immunol.** 2007;178(6):3713-20. *co-first author.
30. Goralski KB, McCarthy TC, Hanniman EA, **Zabel BA**, Butcher EC, Parlee SD, Muruganandan S, Sinal CJ. Chemerin, a novel adipokine that regulates adipogenesis and adipocyte metabolism. **J Biol Chem.** 2007;282(38):28175-88.
31. Allen SJ, **Zabel BA**, Kirkpatrick J, Butcher EC, Nietlispach D, Handel TM. NMR assignment of human chemerin, a novel chemoattractant. **Biomol NMR Assign.** 2007;1(2):171-3.
32. **Zabel BA**, Ohyama T, Zuniga L, Kim JY, Johnston B, Allen SJ, Guido DG, Handel TM, Butcher EC. Chemokine-like receptor 1 expression by macrophages in vivo: regulation by TGF-beta and TLR ligands. **Exp Hematol.** 2006;34(8):1106-14.
33. Kalesnikoff J, Rios EJ, Chen CC, Nakae S, **Zabel BA**, Butcher EC, Tsai M, Tam SY, Galli SJ. RabGEF1 regulates stem cell factor/c-Kit-mediated signaling events and biological responses in mast cells. **Proc Natl Acad Sci U S A.** 2006;103(8):2659-64. PMID: 1413845.
34. **Zabel BA**, Silverio AM, Butcher EC. Chemokine-like receptor 1 expression and chemerin-directed chemotaxis distinguish plasmacytoid from myeloid dendritic cells in human blood. **J Immunol.** 2005;174(1):244-51.
35. **Zabel BA**, Allen SJ, Kulig P, Allen JA, Cichy J, Handel TM, Butcher EC. Chemerin activation by serine proteases of the coagulation, fibrinolytic, and inflammatory cascades. **J Biol Chem.** 2005;280(41):34661-6.
36. **Zabel BA**, Agace WW, Campbell JJ, Heath HM, Parent D, Roberts AI, Ebert EC, Kassam N, Qin S, Zovko M, LaRosa GJ, Yang LL, Soler D, Butcher EC, Ponath PD, Parker CM, Andrew DP. Human G protein-coupled receptor GPR-9-6/CC chemokine receptor 9 is selectively expressed on intestinal homing T lymphocytes, mucosal lymphocytes, and thymocytes and is required for thymus-expressed chemokine-mediated chemotaxis. **J Exp Med.** 1999;190(9):1241-56. PMID: 2195678.
37. Newman JV, **Zabel BA**, Jha SS, Schauer DB. Citrobacter rodentium espB is necessary for signal transduction and for infection of laboratory mice. **Infect Immun.** 1999;67(11):6019-25. PMID: 96988.
38. Schauer DB, **Zabel BA**, Pedraza IF, O'Hara CM, Steigerwalt AG, Brenner DJ. Genetic and biochemical characterization of Citrobacter rodentium sp. nov. **J Clin Microbiol.** 1995;33(8):2064-8. PMID: 228336.

REVIEWS AND BOOK CHAPTERS

1. **Zabel BA**, Rott A, Butcher EC. Leukocyte chemoattractant receptors in human disease pathogenesis. **Ann Rev Pathol Mech Dis.** 2015;10 *In press*.
2. **Zabel BA**, Kwitniewski M, Banas M, Zabieglo K, Murzyn K, and Cichy J, Chemerin regulation and role in host defense. **Am J Clin Exp Immunol.** 2014;3(1):1-19.
3. Cichy JC, **Zabel BA**, *Proteinase Regulators of Plasmacytoid Dendritic Cell Trafficking and Function in Psoriasis*, **Psoriasis: Causes, Diagnosis, and Treatment**, 2011; Edited by J. Carrasco.
4. **Zabel BA**, Zuniga L, Ohyama T, Allen SJ, Cichy J, Handel TM, Butcher EC. Chemoattractants, extracellular proteases, and the integrated host defense



response. **Exp Hematol.** 2006;34(8):1021-32. (**Figure 5** selected as cover art for issue, left).

CITATION ANALYSIS

Sum of times cited excluding self-citations: 1,363
Average citations per article: 35.0
h-index: 19

INVITED LECTURES

Drug Discovery in Academia: Our Experience Targeting CMKLR1 in Demyelinating Disease, Microbiology and Immunology Seminar Series, BYU, Provo, UT October 2014.

A novel CMKLR1 small molecule antagonist suppresses experimental autoimmune demyelinating disease, American Association of Immunologists Meeting, Honolulu, HI, May 2013.

Innovations in Drug Discovery: Advances in Targeting CMKLR1, CCR9, and CXCR7, ChemoCentryx, Inc., Mountain View, CA April 2013.

Chemerin and Its Receptors in Allergy, Autoimmunity and Metabolism, Seminar Series, Soochow University, Suzhou, China, April 2013.

Chemerin and Its Receptors in Disease pathogenesis, Seminar Series, Shenzhen Institute for Advanced Technology, Shenzhen, China, April 2013.

Role of the Chemerin Receptors in Allergy and Autoimmunity, Immunology Seminar Series, Stanford University, June 2011.

Chemoattractant Receptors: Functional Diversity and Therapeutic Opportunities, Seminar Series, San Francisco State University, February 2010.

Role of the Chemerin Receptors in Allergy and Autoimmunity, Pharmacology Seminar Series, Dalhousie University, Halifax, Canada, November 2009.

Chemoattractant Receptors: Functional Diversity and Therapeutic Opportunities, Seminar Series, San Jose State University, September 2009.

Chemoattractant Receptors as Therapeutic Targets, Digestive Disease Center Seminar Series, Stanford University, February 2009.

Innovations in Drug Discovery: The CXCR7 Oncology Program at ChemoCentryx, Molecular Interactions in Health and Disease, Zakopane, Poland, February 2009.

Role of the Chemerin Receptors in Allergy and Autoimmunity, Molecular Interactions in Health and Disease, Zakopane, Poland, February 2009.

Innovations in Drug Discovery: The CXCR7 Oncology Program at ChemoCentryx, Moffitt Cancer Center, Tampa, Florida, December 2008.

Chemerin and its Receptors: Cellular Biology and Potential Roles in Allergy, Autoimmune Disease, and Lipid Metabolism, Geriatric Research Education and Clinical Centers Seminar Series, VAPAHCS, April 2008.

Proteolytic Activation of Chemerin, a Novel Dendritic Cell and Macrophage Chemoattractant, Mass Spectrometry Users' Meeting, Stanford University, September 2005.

CMKLR1, Chemerin, and Plasmacytoid Dendritic Cell Recruitment to Sites of Tissue Damage: Linking Hemostasis, Inflammation, and Immunity. Keystone Symposia on Leukocyte Trafficking: Cellular and Molecular Mechanisms, Taos, New Mexico, March 2005.

CMKLR1 Expression and Chemerin-directed Chemotaxis Distinguish Plasmacytoid from Myeloid Dendritic Cells in Human Blood. Baylor Human Immunology and Biodefense Symposium, Dallas, TX, November 2004.

A Novel Plasmacytoid Dendritic Cell-Selective Chemoattractant and Receptor, FASEB (AAI) Experimental Biology Conference, Washington, DC, April 2004.

INVITED POSTERS (SELECTED FIRST- OR SENIOR-AUTHORED)

LaJevic M, Berahovich RD, Miao Z, Penfold MET, Zegar A, Cichy J, **Zabel BA**, *Chemerin/CMKLR1 are Required for Maximal Skin Disease in Experimental Psoriasis*. Keystone Symposium on Autoimmunity and Tolerance, Keystone, CO February 2015.

Oderup C, Carlson JC, Jang A, Burke TM, Lewen S, Huang K, Tu H, **Zabel BA**, *A novel CXCR7-targeted scFv-FC chimeric antibody kills CXCR7+ glioblastoma and leukemia cancer cells by antibody dependent cellular cytotoxicity*. mAb Symposium, LakePharma, Inc., South San Francisco, CA October 2014.

Zabel BA, Zhang J, Lewen S, Burke TM, Carlson JC, Zoudilova M, Sobel RA, Butcher EC, Graham KL, *Novel CMKLR1 Small Molecule Antagonist Suppresses Autoimmune Demyelinating Disease*. Annual AAI Meeting, Honolulu, HI May 2013.

Monnier J, Lewen S, Carlson JC, **Zabel BA**. *Protective role for chemerin receptor CMKLR1 in experimental pulmonary fibrosis*. Annual AAI Meeting, Honolulu, HI May 2013.

Burke TM, Tu H, Lewen S, Huang K, Carlson JC, Sobel R, **Zabel BA**. *Fms-like tyrosine kinase 3 ligand (FLT3L)-Fc chimera suppresses autoimmune demyelinating disease*. Annual AAI Meeting, Honolulu, HI May 2013.

Lewen S, Zhang J, **Zabel BA**. *Chemerin receptor CCRL2 is required for maximal induction of peanut-induced anaphylaxis*. Annual AAI Meeting, Honolulu, HI May 2013.

Carlson JC, Jang A, Burke TM, Lewen S, Huang K, Tu H, **Zabel BA**, *A novel CXCR7-targeted scFv-FC chimeric antibody kills CXCR7+ glioblastoma and leukemia cancer cells by antibody dependent cellular cytotoxicity*. Annual AAI Meeting, Honolulu, HI May 2013.

Burke TM, Tu H, Lewen S, Huang K, Carlson JC, Sobel R, **Zabel BA**. *Fms-like tyrosine kinase 3 ligand (FLT3L)-Fc chimera suppresses experimental autoimmune encephalomyelitis*. Skippy Frank Conference, Menlo Park, CA February 2013.

Monnier J, Lewen S, O'Hara EF, Butcher EC, **Zabel BA**, *Expression, Regulation and Function of Atypical Chemerin Receptor CCRL2 on Endothelial Cells*, Annual FOCIS Meeting, Vancouver, BC, Canada June 2012.

Rott A, Burke TM, Lewen S, **Zabel BA**, *Role of CCR9 in the Pathophysiology of Citrobacter rodentium Infection*, Annual FOCIS Meeting, Vancouver, BC, Canada June 2012.

Lewen S, Zhang, J, **Zabel BA**, *Role of the Chemerin Receptor CCRL2 in Peanut-induced Anaphylaxis*, Annual FOCIS Meeting, Vancouver, BC, Canada June 2012.

Burke TM, Tu H, Lewen S, Huang K, **Zabel BA**, *Robust in vivo Expansion of Dendritic Cells By Hydrodynamic Gene Delivery of Novel Fms-like Tyrosine Kinase 3 Ligand (FLT3L)-Fc Chimera*, Annual FOCIS Meeting, Vancouver, BC, Canada June 2012.

Zabel BA, Zhang J, Lewen S, Burke TM, Zoudilova M, Sobel RA, Butcher EC, Graham KL, *Novel CMKLR1 Small Molecule Antagonist Suppresses Autoimmune Demyelinating Disease*, Annual FOCIS Meeting, Vancouver, BC, Canada June 2012.

Monnier J, Butcher EC, **Zabel BA**, *Regulation of the atypical chemerin receptor CCRL2 on activated brain endothelial cells*, Annual FOCIS Meeting, Boston, MA, June 2010.

Huss R, Huddleston JI, Goodman SB, Butcher EC, **Zabel BA**, *The Characterization of Natural Killer Cells in Orthopaedic Wear Particle-mediated Joint Inflammation*, 56th Annual Meetings of the Orthopaedic Research Society, New Orleans, LA, March 2010.

Zabel BA, Ohyama T, Kim JY, Zuniga L, Allen SJ, Handel TM, Butcher EC, *Functional Characterization of Chemerin Receptors*, Keystone Symposia on Leukocyte Trafficking, Keystone, CO, January 2008.

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AWARDS

2014	Albert Rose Established Investigator Award, Pulmonary Fibrosis Foundation
2010	56 th Annual Orthopaedic Research Society's New Investigator Recognition Award (senior author on one of conference's top posters)
2004-2007	Postdoctoral Fellowship, Ruth L. Kirschstein National Research Service Award
2004	Hugh McDevitt Prize, Best PhD Dissertation Research in the Immunology Program
2000	Howard Hughes Medical Institute Graduate Fellowship Honorable Mention
2000	Pre-doctoral Student Research Fellowship, American Digestive Health Foundation/ American Gastroenterological Association