

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Steven L. Kunkel		POSITION TITLE Endowed Professor of Pathology Research	
eRA COMMONS USER NAME (credential, e.g., agency login) slkunkel			
EDUCATION/TRAINING ( <i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i> )			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
North Dakota State University	BS	1969-1973	Biology
North Dakota State University	MS	1974	Microbiology
University of Kansas	PhD	1974-1978	Microbiology
University of Connecticut	Postdoc	1978-1980	Immunopathology

**A. Positions and Honors**

**Positions:**

- 1980-1982 Instructor, Department of Pathology, Univ. of Michigan Med. Sch., Ann Arbor, MI
- 1982-1986 Assistant Professor, Department of Pathology, Univ. of Michigan Med. Sch., Ann Arbor, MI
- 1986-1991 Associate Professor, Department of Pathology, Univ. of Michigan Med. Sch., Ann Arbor, MI
- 1991- Professor, Department of Pathology, Univ. of Michigan Med. Sch., Ann Arbor, MI
- 1996 Endowed Professor, Department of Pathology, Univ. of Michigan Med. Sch., Ann Arbor, MI

**Honors:**

- 1973 Phi Kappa Phi, National Scholastic Honor Society
- 1985-1990 Established Investigator, American Heart Association
- 1996- Distinguished Faculty Award – University of Michigan
- 1996-2006 NIH-MERIT Award
- 1997- Endowed Professor of Pathology Research
- 1998- Outstanding Alumni, North Dakota State University
- 2001 Distinguished Faculty Lectureship Award, University of Michigan
- 2005 American Thoracic Society, Recognition for Scientific Accomplishments Award, 2005

**B. Selected peer-reviewed publications (in chronological order).**

1. Jakubzick C, Choi ES, Kunkel SL, Evanoff H, Martinez FJ, Puri RK, Flaherty KR, Toews GB, Colby TV, Kazerooni EA, Gross BH, Travis WD, Hogaboam CM. Augmented pulmonary IL-4 and IL-13 receptor subunit expression in idiopathic interstitial pneumonia. J Clin Pathol. 2004 May;57(5):477-86. PMID:15113854
2. Jakubzick C, Choi ES, Carpenter KJ, Kunkel SL, Evanoff H, Martinez FJ, Flaherty KR, Toews GB, Colby TV, Travis WD, Joshi BH, Puri RK, Hogaboam CM. Human pulmonary fibroblasts exhibit altered interleukin-4 and interleukin-13 receptor subunit expression in idiopathic interstitial pneumonia. Am J Pathol. 2004 Jun;164(6):1989-2001. PMID:15161635
3. Choi, ES, Jakubzick, C, Carpenter KJ, Kunkel SL, Evanoff H, Martinez FJ, Flaherty KR, Toews GB, Colby TV, Kazerooni EA, Gross BH, Travis WD, Hogaboam CM. Enhanced Monocyte Chemoattractant Protein-3/CC Chemokine Ligand-7 in Usual Interstitial Pneumonia. Am J Respir Crit Care Med. 2004 Sep 1;170(5):508-15. PMID:15191918
4. Jakubzick C, Wen H., Matsuskawa A, Keller M, Kunkel SL, Hogaboam CM. Role of CCR4 ligands, CCL17 and CCL22, during Schistosoma mansoni egg-induced pulmonary granuloma formation in mice. Am J Pathol 2004 Oct;165(4):1211-21. PMID:15466387
5. Jakubzick, C, Kunkel SL, Puri RK, Hogaboam CM. Therapeutic targeting of IL-4 and IL-13 responsive cells in pulmonary fibrosis. Immunol Res 2004, 30(3):339-49. PMID:15531774
6. Benjamim CF, Lundy SK, Lukacs NW, Hogaboam CM, Kunkel SL Reversal of long-term sepsis-induced immunosuppression by dendritic cells. Blood. 2005 May 1;105(9):3588-95. PMID: 15604223

7. Freeman CM, Chiu BC, Stolberg VR, Hu J, Zeibecoglou K, Lukacs NW, Lira SA, Kunkel SL, Chensue SW. CCR8 is expressed by antigen-elicited, IL-10-producing CD4+CD25+ T cells, which regulate Th2-mediated granuloma formation in mice. *J Immunol*. 2005 Feb 15;174(4):1962-70. PMID:15699124
8. Coelho AL, Hogaboam CM, Kunkel SL. Chemokines provide the sustained inflammatory bridge between innate and acquired immunity. *Cytokine Growth Factor Rev*. 2005 Dec;16(6):553-60. PMID:15967703
9. Lukacs NW, Hogaboam CM, Kunkel SL. Chemokines and their receptors in chronic pulmonary disease. *Curr Drug Targets Inflamm Allergy*. 2005 Jun;4(3):313-7. PMID:16101539
10. Hogaboam CM, Carpenter KJ, Evanoff H, Kunkel SL. Approaches to evaluation of fibrogenic pathways in surgical lung biopsy specimens. *Methods Mol Med*. 2005;117:209-21. PMID:16118454
11. Huaux F, Gharaee-Kermani M, Liu T, Morel V, McGarry B, Ullenbruch M, Kunkel SL, Wang J, Xing Z, Phan SH. Role of Eotaxin-1 (CCL11) and CC chemokine receptor 3 (CCR3) in bleomycin-induced lung injury and fibrosis. *Am J Pathol*. 2005 Dec;167(6):1485-96. PMID:16314464
12. Choi ES, Pierce EM, Jakubzick C, Carpenter KJ, Kunkel SL, Evanoff H, Martinez FJ, Flaherty KR, Moore BB, Toews GB, Colby TV, Kazerooni EA, Gross BH, Travis WD, Hogaboam CM. Focal interstitial CC chemokine receptor 7 (CCR7) expression in idiopathic interstitial pneumonia. *J Clin Pathol*. 2006 Jan;59(1):28-39. PMID:16394278
13. Wen H, Hogaboam CM, Gauldie J, Kunkel SL. Severe sepsis exacerbates cell-mediated immunity in the lung due to an altered dendritic cell cytokine profile. *Am J Pathol*. 2006 Jun;168(6):1940-50. PMID:16723709
14. Freeman CM, Stolberg VR, Chiu BC, Lukacs NW, Kunkel SL, Chensue SW. CCR4 participation in Th type 1 (mycobacterial) and Th type 2 (schistosomal) anamnestic pulmonary granulomatous responses. *J Immunol* 2006 Sep 15;177(6):4149-58. PMID:16951380
15. Ness TL, Ewing JL, Hogaboam CM, Kunkel SL. CCR4 is a key modulator of innate immune responses. *J Immunol* 2006 Dec 1;177(11):7531-9. PMID:17114422
16. Keane MP, Gomperts BN, Weigt S, Xue YY, Burdick MD, Nakamura H, Zisman DA, Ardehali A, Saggar R, Lynch JP 3rd, Hogaboam C, Kunkel SL, Lukacs NW, Ross DJ, Grusby MJ, Strieter RM, Belpario JA. IL-13 is pivotal in the fibro-obliterative process of bronchiolitis obliterans syndrome. *J Immunol* 2007 Jan 1;178(1):511-9. PMID:17182591
17. Pierce EM, Carpenter K, Jakubzick C, Kunkel SL, Evanoff H, Flaherty KR, Martinez FJ, Toews GB, Hogaboam CM. Idiopathic pulmonary fibrosis fibroblasts migrate and proliferate to CC chemokine ligand 21. *Eur Respir J* 2007 Jun;29(6):1082-93. PMID:17331965
18. Pierce EM, Carpenter K, Jakubzick C, Kunkel SL, Flaherty KR, Martinez Fj, Hogaboam CM. Therapeutic targeting of CC ligand 21 or CC chemokine receptor 7 abrogates pulmonary fibrosis induced by the adoptive transfer of human pulmonary fibroblasts to immunodeficient mice. *Am J Pathol* 2007 Apr;170(4):1152-64. PMID:17392156
19. Rudd BD, Schaller MA, Smit JJ, Kunkel SL, Neupane R, Kelley L, Berline AA, Lukacs NW. MyD88-mediated instructive signals in dendritic cells regulate pulmonary immune responses during respiratory virus infection. *J Immunol* 2007 May;178(9):5820-7. PMID:17442966
20. Wen, H, Hogaboam, CM, Lukacs, NW, Cook, DN, Lira, SA, Kunkel, SL. The chemokine receptor CCR6 is an important component of the innate immune response. *Eur J Immunol* 2007 Sep;37(9): 2487-98. PMID:17694574
21. Raymond T, Schaller M, Hogaboam CM, Lukacs NW, Rochford R, Kunkel SL. Toll Like Receptors, Notch ligands and Cytokines Drive the Chronicity of Lung Inflammation. *Proc Am Thorac Soc* 2007 Dec;4(8):635-41. PMID:18073395
22. Coelho AL, Schaller MA, Benjamim CF, Orlofsky AZ, Hogaboam CM, Kunkel SL The chemokine CCL6 promotes innate and adaptive immunity via immune cell activation and recruitment. *J Immunol* 2007 Oct 15;179(8):5474-82. PMID:17911634
23. Ito T, Schaller M, Hogaboam CM, Standiford TJ, Chensue SW, Kunkel SL. TLR9 activation is a key event for the maintenance of a mycobacterial antigen-elicited pulmonary granulomatous response. *Eur J Immunol* 2007 Oct;37(10):2847-55. PMID:17853411
24. Schaller MA, Neupane R, Rudd BD, Kunkel SL, Kallal LE, Lincoln P, Lowe JB, Man Y, Lukacs NW. Notch ligand Delta-like 4 regulates disease pathogenesis during respiratory viral infections by modulating Th2 cytokines. *J Exp Med* 2007 Nov 26;204(12):2925-34. PMID:17998388
25. Wen H, Schaller MA, Dou Y, Hogaboam, CM, Kunkel SL. Dendritic cells at the interface of innate and acquired immunity: the role for epigenetic changes. *J Leukoc Biol* 2008 Mar;83(3):439-46. PMID:17991763

26. Joshi AD, Raymond T, Coelho AL, Kunkel SL, Hogaboam CM. A systemic granulomatous response to *Schistosoma mansoni* eggs alters responsiveness of bone marrow-derived macrophages to toll-like receptor agonists. *J Leukoc Biol* 2008 Feb;83(2):314-24. PMID:18029396
27. Wen, H, Dou Y, Hogaboam CM, Kunkel SL. Epigenetic regulation of dendritic cell-derived interleukin-12 facilitates immunosuppression after a severe innate immune response. *Blood*. 2008 Feb 15; 111(4):1797-804. PMID:18055863
28. Trujillo G, O'Connor EC, Kunkel SL, Hogaboam CM. A novel mechanism for CCR4 in the regulation of macrophage activation in bleomycin-induced fibrosis. *Am J Pathol* 2008 May;172(5):1209-21. PMID:18403600
29. Ishii M, Hogaboam CM, Joshi A, Ito T, Fong DJ, Kunkel SL. CC chemokine receptor 4 modulates Toll-like receptor 9-mediated signaling. *Eur J Immunol* 2008 Aug;38(8):2290-302. PMID:18624303
30. Cavassani KA, Ishii M, Wen H, Schaller MA, Lincoln PM, Lukacs NW, Hogaboam CM, Kunkel SL. TLR3 is an endogenous sensor of tissue necrosis during inflammatory events. *J Exp Med* 2008 Oct 27;205(11):2609-21. PMID:118838547
31. Meneghin A, Choi ES, Evanoff HL, Kunkel SL, Martinex FJ, Flaherty KR, Toews GB, Hogaboam CM. TLR9 is expressed in idiopathic interstitial pneumonia and its activation promotes in vitro myofibroblast differentiation. *Histochem Cell Biol* 2008 Nov;130(5):979-92. PMID:18633634
32. Joshi AD, Schaller MA, Lukacs NW, Kunkel SL, Hogaboam CM. TLR3 modulates immunopathology during a *Schistosoma mansoni* egg-driven Th2 response in the lung. *Eur J Immunol* 2008 Dec;38(12):3436-49. PMID:19009529
33. Ito T, Schaller M, Hogaboam CM, Standiford TJ, Sandor M, Lukacs NW, Chensue SW, Kunkel SL. TLR9 regulates the mycobacteria-elicited pulmonary granulomatous immune response in mice through DC-derived Notch ligand Delta-like 4. *J Clin Invest* 2009 Jan;119(1):33-46. PMID:19075396
34. Mortaz E, Kraneveld AD, Smit JJ, Kool M, Lambrecht BN, Kunkel SL, Lukacs NW, Nijkamp FP, Folkerts G. Effect of cigarette smoke extract on dendritic cells and their impact on T-cell proliferation. *PLoS One* 2009;4(3):e4946. PMID:19293939
35. Mukherjee S, Schaller MA, Neupane R, Kunkel SL, Lukacs NW. Regulation of T cell activation by notch ligand, DLL4, promotes IL-17 production and *rorc* activation. *J. Immunol.* 2009 Jun 15;182(12):7381-8. PMID: 19494260
36. Li X, Corsa CAS, Kunkel SL, Dou Y. The MOF-MSL1v1 complex but not the MSL complex is required for the acetylation of non-histone substrates. *Nature Struct Mol Biol.*

## C. Research Support

### Ongoing Research Support

5 P01 HL031963 Kunkel (PI)  
NIH/NHLBI

02/01/05 – 01/31/10

Inflammatory Cells and Lung Injury. The major goals of this project are to assess the role of cytokine cascades in the initiation and maintenance of chronic interstitial lung disease with an emphasis on IL-4/IL-13 dependent cytokine and chemokine responses as compared to gamma interferon dependent responses.

Role: Principal Investigator

5 R01 HL031237 Kunkel (PI)  
NIH/NHLBI

01/01/84 – 11/30/2013

Monokine Gene Expression/Regulation in Lung Injury. The major goals of this project are to assess cytokine dependent mechanisms that are responsible for the acute and chronic alterations associated with experimental systemic inflammation leading to a septic response with multiorgan injury.

R01 HL089216 Kunkel (PI)  
NIH/NHLBI

12/01/2008-11/30/2013

Cytokine Phenotypes Alter the Host's Response During Chronic Lung Inflammation

Program Director/Principal Investigator (Last, First, Middle):

The major goal of this project is to assess the role of viral infection as a complicating aspect of chronic lung disease using an experimental animal model system.

5R33 HL092845 Kunkel (PI) 6/01/08-5/31/2011  
NIH/NHLB

A multi-scale and multi-system approach to understand granuloma formation in TB

The major goal of this R33 is to use our in vivo modeling capability to assess experimental granuloma development and partner with scientists using an in silico approach to model TB lung granuloma evolution.

5 T32 AI007413 Kunkel (PI) 09/01/03 – 08/31/08  
NIH/NHLBI

The major goals of this project are to direct the training grant for both predoctoral students and post-doctoral fellows investigating the immunologic processes of disease.

Role: Principal Investigator

### **Completed Research Support**

5 P50 HL074024 Standiford (PD), Kunkel (PI) 09/01/03 – 06/30/08  
NIH/NHLBI

SCCOR in Translational Research in Acute Lung Injury

Project 1 “Dynamic Effects of Chemokines on Systemic Inflammation”

The major goals of this project are assess the regulatory role of TARC (CCL17) and MDC (CCL22), which bind to the chemokine receptor CCR4, as important contributors to the developing acute lung injury found in both experimental models clinical specimens.

Role: Principal Investigator, Project 1