

**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 Bruce S. Bochner	POSITION TITLE Professor of Medicine and Division Director
eRA COMMONS USER NAME bbochne1	

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Johns Hopkins University, Baltimore, MD	B.A. w/honors	1978	Natural Sciences
University of Illinois, Chicago, IL	M.D. w/honors	1982	Medicine
University of Illinois, Chicago, IL	Intern/Resident	1982-1985	Internal Medicine
Johns Hopkins University, Baltimore, MD	Postdoctoral	1985-1988	Allergy & Immunology

**A. Positions and Honors.**

**Positions**

- 1988-1989 Instructor in Medicine, Johns Hopkins University School of Medicine, Baltimore
- 1989-1994 Assistant Professor, Johns Hopkins University School of Medicine, Baltimore
- 1994-1999 Associate Professor, Johns Hopkins University School of Medicine, Baltimore
- 1999- Professor, Johns Hopkins University School of Medicine, Baltimore
- 2003- Director, Division of Allergy & Clinical Immunology, Johns Hopkins University School of Medicine, Baltimore

**Honors**

1982 - AOA Medical Honors Society; 1988 - New Investigator Award, American Lung Association; 1990 - Developing Investigator Award, Asthma and Allergy Foundation of America; 1992 - Burroughs Wellcome Developing Investigator Award; 1993-present - Editorial Board and Associate Editor, Journal of Allergy and Clinical Immunology; 1998 - American Society for Clinical Investigation and Collegium Internationale Allergologicum; 2000-2004 - Immunological Sciences (IMS)/Hypersensitivity, Autoimmune and Immune-mediated Diseases (HAI) Study Section, NIAID; 2000-2005 - Director, American Board of Allergy and Immunology; 2005 - Cosner Scholar in Translational Research; 2006 - Association of American Physicians; Board of Directors, American Academy of Allergy, Asthma and Immunology; Interurban Club; 2007 - Fellow of the American College of Physicians; David M. Levine Excellence in Mentoring Award, Department of Medicine, Johns Hopkins University School of Medicine

**B. Selected peer-reviewed publications** (in chronological order, from a total of over 195):

1. Bochner, B.S., Peachell, P.T., Brown, K.E., Schleimer, R.P. Adherence of human basophils to cultured umbilical vein endothelial cells. J. Clin. Invest. 81:1355-1364, 1988
2. Bochner, B.S., Lucinskas, F.W., Gimbrone, M.A. Jr., Newman, W., Sterbinsky, S.A., Derse-Anthony, C.P., Klunk, D., Schleimer, R.P. Adhesion of human basophils, eosinophils, and neutrophils to IL-1-activated human vascular endothelial cells: contributions of endothelial cell adhesion molecules. J. Exp. Med. 173:1553-1557, 1991
3. Bochner, B.S. and Lichtenstein, L.M. Anaphylaxis. N. Engl. J. Med. 324:1785-1790, 1991
4. Schleimer, R.P., Sterbinsky, S., Kaiser, J., Bickel, C., Klunk, D., Tomioka, K., Newman, W., Lucinskas, F.W., Gimbrone, M.A. Jr., McIntyre, B.W., and Bochner, B.S. Interleukin-4 induces adherence of human eosinophils and basophils but not neutrophils to endothelium: association with expression of VCAM-1. J. Immunol. 148:1086-1092, 1992
5. Georas, S.N., McIntyre, B.W., Ebisawa, M., Bednarczyk, J., Schleimer, R.P., and Bochner, B.S. Expression of a functional laminin receptor (VLA-6) on human eosinophils. Blood 82:2872-2879, 1993
6. Bochner, B.S., Sterbinsky, S.A., Bickel, C.A., Werfel, S., Wein, M., and Newman, W. Differences between human eosinophils and neutrophils in the function and expression of sialic acid-containing counterligands for E-selectin. J. Immunol. 152:774-782, 1994
7. Bochner, B.S., Klunk, D.A., Sterbinsky, S.A., Coffman, R.L., and Schleimer, R.P. Interleukin-13 selectively induces vascular cell adhesion molecule-1 (VCAM-1) expression in human endothelial cells. J. Immunol. 154:799-803, 1995
8. Matsumoto, K., Schleimer, R.P., Saito, H., Iikura, Y., and Bochner, B.S. Induction of apoptosis in human

- eosinophils by anti-Fas antibody treatment in vitro. *Blood* 86:1437-1443, 1995
9. Bochner, B.S., Udem, B.J., and Lichtenstein, L.M. Immunological aspects of allergic asthma. *Annu. Rev. Immunol.* 12:295-335, 1994
  10. Bochner, B.S., Sterbinsky, S.A., Saini, S.S., Briskin, M., and MacGlashan, D.W., Jr. Counter-receptors on human basophils for endothelial cell adhesion molecules. *J. Immunol.* 157:844-850, 1996
  11. Fryer, A.D., Costello, R.W., Yost, B.L., Lobb, R.R., Tedder, T.A., Steeber, D.A., and Bochner, B.S. Antibody to VLA-4, but not to L-selectin, protects neuronal M<sub>2</sub> muscarinic receptors in antigen-challenged guinea pig airways. *J. Clin. Invest.* 99:2036-2044, 1997
  12. Matsumoto, K., Appiah-Pippim, J., Schleimer, R.P., Bickel, C.A., Beck, L.A., and Bochner, B.S. CD44 and CD69 represent different types of cell surface activation markers for human eosinophils. *Am. J. Respir. Cell Mol. Biol.* 18: 860-866, 1998
  13. Grayson, M.H., Van der Vieren, M., Sterbinsky, S.A., Gallatin, W.M., Hoffman, P.A., Staunton, D.E., and Bochner, B.S.  $\alpha$ d $\beta$ 2 integrin is expressed on human eosinophils and functions as an alternative ligand for VCAM-1. *J. Exp. Med.* 188:2187-2191, 1998
  14. Bochner, B.S., Bickel, C.A., Taylor, M.L., MacGlashan, D.W. Jr., Gray, P.W., Raport, C.J., and Godiska, R. Macrophage derived chemokine (MDC) induces human eosinophil chemotaxis in a CCR3- and CCR4-independent manner. *J. Allergy Clin. Immunol.* 103:527-532, 1999
  15. Saini, S.S., MacGlashan, D.W. Jr., Sterbinsky, S.A., Togias, A.K., Adelman, D.C., Lichtenstein, L.M., and Bochner, B.S. Downregulation of human basophil IgE and Fc $\epsilon$ RI $\alpha$  surface densities and mediator release by anti-IgE-infusions is reversible in vitro and in vivo. *J. Immunol.* 162:5624-5630, 1999
  16. Seminario, M.-C., Saini, S.S., MacGlashan, D.W. Jr., and Bochner, B.S. Intracellular expression and release of Fc $\epsilon$ RI $\alpha$  by human eosinophils. *J. Immunol.* 162:6893-6900, 1999
  17. Van der Vieren, M., Crowe, D.T., Hoekstra, D., Adams, L., Vazeux, R., Grayson, M.H., Bochner, B.S., and Staunton, D.E. The leukocyte integrin  $\alpha$ 5 $\beta$ 2 binds VCAM-1: Evidence for a binding interface between I domain and VCAM-1. *J. Immunol.* 163:1984-1990, 1999
  18. Kikly, K.K., Bochner, B.S., Freeman, S., Tan, K., Gallagher, K., D'Alessio, K., Holmes, S.D., Abrahamson, J., Hopson, C., Fischer, E., Erickson-Miller, C.L., Tachimoto, H., Schleimer, R.P., and White, J.R. Identification of SAF-2, a novel glycoprotein expressed on eosinophils, mast cells and basophils. *J. Allergy Clin. Immunol.* 105:1093-1100, 2000
  19. Tachimoto, H., Burdick, M., Hudson, S.A., Kikuchi, M., Konstantopoulous, K. and Bochner, B.S. CCR3-active chemokines promote rapid detachment of eosinophils from VCAM-1 in vitro. *J. Immunol.* 165:2748-2754, 2000
  20. Davenpeck, K.L., Brummet, M.E., Sterbinsky, S.A., Mayer, R.J., and Bochner, B.S. Activation of human leukocytes reduces surface P-selectin glycoprotein ligand-1 (PSGL-1, CD162) and adhesion to P-selectin in vitro. *J. Immunol.* 165: 2764-2772, 2000
  21. Taylor, M.L., Brummet, M., Hudson, S.A., Miura, K. and Bochner, B.S. Expression and function of P-selectin glycoprotein ligand -1 (PSGL-1, CD162) on human basophils. *J. Allergy Clin. Immunol.* 106:918-924, 2000
  22. Tachimoto, H., Hudson, S.A., and Bochner, B.S. Acquisition and alteration of adhesion molecules during cultured human mast cell differentiation. *J. Allergy Clin. Immunol.* 107:302-309, 2001
  23. Seminario, M.C., Guo, J., Bochner, B.S., Beck, L.A., and Georas, S.N. Human eosinophils constitutively express nuclear factor of activated T cells p and c. *J. Allergy Clin. Immunol.* 107:143-152, 2001
  24. Bochner, B.S. and Schleimer, R.P. Mast cells, basophils, and eosinophils: distinct but overlapping pathways for recruitment. *Immunol. Reviews* 179:5-15, 2001
  25. Tachimoto, H., Kikuchi, M., Hudson, S.A. Bickel, C.A., Hamilton, R.G., and Bochner, B.S. Eotaxin-2 alters eosinophil integrin function via mitogen-activated protein kinases. *Am. J. Respir. Cell Mol. Biol.* 26:645-649, 2002.
  26. Lim, L.H., Bochner, B.S., and Wagner, E.M. Leukocyte recruitment in the airways: an intravital microscopic study of rat tracheal microcirculation. *Am. J. Physiol. Lung Cell Mol. Physiol.* 282:L957-L958, 2002.
  27. Aizawa, H., Plitt, J., and Bochner, B.S. Human eosinophils express two Siglec-8 splice variants. *J. Allergy Clin. Immunol.* 109:176, 2002
  28. Nutku, T.E., Aizawa, H., Hudson, S.A., and Bochner, B.S. Ligation of Siglec-8: a selective mechanism for induction of human eosinophil apoptosis. *Blood* 101:5014-5020, 2003
  29. Aizawa, H., Zimmermann, N., Carrigan, P.E., Lee, J.J., Rothenberg, M.E., and Bochner, B.S. Molecular cloning of mouse orthologs of Siglec-5 and Siglec-10: Comparison to human Siglec-8, mSiglec-E and mSiglec-F and analysis of expression in mouse tissues and eosinophils. *Genomics* 82:521-530, 2003
  30. Bochner, B.S., Hudson, S.A., Xiao, H.Q. and Liu, M.C. Release of both CCR4-active and CXCR3-active chemokines during human allergic pulmonary late phase reactions. *J. Allergy Clin. Immunol.* 112:920-924, 2003
  31. Bochner, B.S. Cellular adhesion in inflammation, in Allergy Principles and Practice, 6th Edition. N.F. Adkinson, Jr., J.W. Yunginger, W.W. Busse, B.S. Bochner, S.T. Holgate, and F.E.R. Simons, editors,

- Mosby, St. Louis pp. 117-134, 2003
32. Burdick, M.M., Bochner, B.S., and Konstantopoulos, K. Colon carcinoma cell glycolipids, integrins, and other glycoproteins mediate adhesion to endothelium under flow. *Am. J. Physiol. Cell Physiol.* 284:C977-C987, 2003
  33. McCarty, O.J.T., Tien, N., Bochner, B.S., and Konstantopoulos, K. Exogenous eosinophil activation converts PSGL-1-dependent binding to CD18-dependent stable adhesion to platelets in shear flow. *Am. J. Physiol. Cell Physiol.* 284:C1223-C1234, 2003
  34. Bochner, B.S. Verdict in the case of therapies versus eosinophils: the jury is still out. *J. Allergy Clin. Immunol.* 113:3-9, 2004
  35. Liu, Z., Kim, J., Sypek, J.P., Wang, I.-M., Oppenheim, F.G., and Bochner, B.S. Gene expression profiles in human nasal polyp tissues studied by DNA microarray. *J. Allergy Clin. Immunol.* 114:783-790, 2004
  36. Bochner, B.S., Alvarez, R.A., Mehta, P., Bovin, N.V., Blixt, O., White, J.R., and Schnaar, R.L. Glycan array screening reveals a candidate ligand for Siglec-8. *J. Biol. Chem.* 280:4307-4312, 2005
  37. Nutku, E., Hudson, S.A., and Bochner, B.S. Mechanism of Siglec-8-induced human eosinophil apoptosis: role of caspases and mitochondrial injury. *Biochem Biophys Res Commun* 336:918-924, 2005.
  38. Lim, L.H.-K., Burdick, M.M., Hudson, S.A., Konstantopoulos, K., and Bochner, B.S. Stimulation of human endothelium with interleukin 3 (IL-3) induces selective basophil accumulation in vitro. *J. Immunol.* 176:5346-5353, 2006
  39. Yokoi, H., Myers, A., Matsumoto, K., Crocker, P.R., Saito, H., and Bruce S. Bochner. Alteration and acquisition of Siglecs during in vitro maturation of CD34+ progenitors into human mast cells. *Allergy* 61:769-776, 2006
  40. Nutku-Bilir, E., Hudson, S.A. and Bochner, B.S. Interleukin-5 priming of human eosinophils alters Siglec-8-mediated apoptosis pathways. *Am. J. Respir. Cell Mol. Biol.* 38:121-124, 2008
  41. Yokoi, H., Choi, O.H., Hubbard, W., Lee, H.-S., Canning, B.J., Lee, H.H., Ryu, S.-D., Bickel, C.A., Hudson, S.A., MacGlashan, Jr., D.W. and Bochner, B.S. Inhibition of FcεRI-dependent mediator release and calcium flux from human mast cells by Siglec-8 engagement. *J. Allergy Clin. Immunol.* 121:499-505, 2008
  42. Zimmermann, N., McBride, M.L., Yamada, Y., Hudson, S.A., Jones, C., Cromie, K., Crocker, P.R., Rothenberg M.E. and Bochner, B.S. Siglec-F antibody administration to mice selectively reduces blood and tissue eosinophils. *Allergy* (in press)
  43. von Gunten, S. and Bochner, B.S. Basic and clinical immunology of Siglecs. *The Year in Immunology* 2008 (in press)

### C. Research Support.

#### Active

Principal Investigator: Bruce S. Bochner

“Targeting Siglec-8/Siglec-F to Reduce Allergic Responses in vitro and in vivo”

Agency: National Institutes of Health

Type: R01 AI72265-01

Period: 07/01/07-06/30/12

These studies will explore ligands for Siglec-8/Siglec-F, their functions, and the mechanisms by which they regulate eosinophilic and allergic responses.

Principal Investigator: Bruce S. Bochner

“Novel Genetic and Therapeutic Approaches Focusing on Siglec-8 for the Diagnosis and Treatment of Human Idiopathic Eosinophilic Disorders”

Agency: Dana Foundation

Type: Consortium Grant

Period: 10/01/07-09/30/10

Collaborative studies with Cincinnati Children’s Hospital Medical Center (Marc Rothenberg, co-PI) will determine whether asthma, eosinophilic esophagitis and related diseases are associated with mutations in Siglec-8.

Principal Investigator: Mark C. Liu

“Dendritic Cells and IgE in Asthma”

Agency: National Institutes of Health

Type: R01 AI063184

Period: 6/1/05 – 2/28/10

This study will examine the role of dendritic cells in human allergic inflammation.

Principal Investigator: Donald MacGlashan, Jr.

“Efficacy of IgE in Mediating Allergic Reactions in Vivo - Project 1 (Principal Investigator: Bruce S. Bochner) Determination of Cellular and Clinical Thresholds for IgE-mediated Reactivity”

Agency: National Institutes of Health

Type: U19-AI070345

Period: 8/1/06 – 7/31/11

While there is general acceptance of the central role for IgE in diseases such as asthma, rhinitis, food allergy and anaphylaxis, there remains only a poor understanding of the quantitative requirements for IgE in the expression of these diseases. This application focuses on obtaining better quantitative insights on several aspects of the problem.

Principal Investigator: Tao Zheng

“Interleukin 13 in Atopic Dermatitis and Its Relationship with the Development of Asthma”

Agency: National Institutes of Health

Type: 1R01AI075025

Period: 06/15/08-05/31/2013

This research focuses on an inducible transgenic mouse system of selective IL-13 overexpression in the skin to model atopic dermatitis, the atopic march, and asthma.

Principal Investigator: Bruce S. Bochner

“Basic and Clinical Immunology”

Agency: National Institutes of Health

Type: T32AI007056-31

Period: 07/01/08-06/30/2013

This longstanding training grant supports four postdoctoral trainees for up to three years of postdoctoral training in allergy and clinical immunology with a priority towards academically oriented MDs and MD,PhD's, but also PhD scientists.

**Inactive (completed within the last three years)**

Principal Investigator: Bruce S. Bochner

“Adhesion Molecule Biology in Allergic Cells”

Agency: National Institutes of Health

Type: R01 AI41472-09

Period: 07/01/03 – 12/31/07

These studies will examine the function of Siglec-8 and related structures on human eosinophils, basophils, and mast cells in vitro.

Principal Investigator and Program Director: Bruce S. Bochner

“Tissue-Specific Mechanisms of Allergic Inflammation”

Agency: National Institutes of Health

Type: P01 AI50530-01

Period: 09/30/01 – 05/31/06

Project 1: Bruce S. Bochner

“The Role of TNF $\alpha$  in the Allergic Late-Phase Response”

The project will improve our understanding of the role of TNF $\alpha$  and other mediators in allergen-induced, tissue-specific cell recruitment responses in humans that may be relevant to allergic disease pathogenesis and treatment.

Project 2: Robert P. Schleimer

“Mechanisms of Basophil Recruitment in Allergic Diseases”

The overall goal of these studies is to better define the pathways leading to infiltration of basophils into allergic reaction sites in humans.

Project 3: Mark Liu

“Mechanisms of T Lymphocyte Recruitment to the Lung”

These studies will yield insights into the mechanisms of allergic inflammation, helper/memory lymphocyte recruitment, and airway sensitization that may guide approaches to treatment.

Core A – Bruce S. Bochner

“Administrative Core”

The goal of Core A is to ensure that all investigators work efficiently and collaboratively in their studies of tissue-specific mechanisms of allergic inflammation.