

Curriculum Vitae

Brian J. Knoll, Ph.D.

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Contact Information

University of Houston, College of Pharmacy
Dept. of Pharmacological and Pharmaceutical Sciences
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Education

Undergraduate

1971-1975 University of Notre Dame, South Bend, IN, B.S. (Biology)

Graduate

1975-1979 Dept. of Microbiology, University of Arizona College of Medicine,
Tucson, AZ. Ph.D. (Molecular Biology and Genetics), with David W. Mount
Ph.D. Thesis title: *Control of Lysogenization by Bacteriophage λ*

Postgraduate

1979-1983 Postdoctoral fellow, Dept. of Cell Biology, Baylor College of Medicine, Houston,
TX, with Bert O'Malley (Molecular Biology and Endocrinology)

1997-1999 Master Teacher Fellowship Program, Baylor College of Medicine, Houston, TX

2004 Advanced Immunology Course, Palo Alto, CA (American
Association of Immunologists)

2008 Advanced Immunology Course, Minneapolis, MN (American Association of
Immunologists)

2015 Advanced Immunology Course, Boston, MS (American Association of
Immunologists)

Professional Appointments

2014- Assistant Dean for Graduate Programs, University of Houston College
of Pharmacy

2006-2014 Director of Graduate Education, Dept. of Pharmacological and Pharmaceutical
Sciences, University of Houston, College of Pharmacy

2000- Associate Professor, Dept. of Pharmacological and Pharmaceutical Sciences,
University of Houston, College of Pharmacy

2000- Dept. of Biology and Biochemistry, University of Houston, College of Natural
Sciences and Mathematics (Joint)

1996-2000 Assistant Professor, Dept. of Molecular Physiology and Biophysics, Baylor
College of Medicine, Houston

1994-1996 Research Microbiologist, Houston VA Medical Center

1991-1996 Assistant Professor, Dept. of Medicine, Baylor College of Medicine, Houston

1984-1991 Member of the Graduate Faculty, Graduate School of Biomedical Sciences,
University of Texas Health Sciences Center, Houston

- 1983-1991 Assistant Professor, Dept. of Pathology and Laboratory Medicine, University of Texas Health Sciences Center, Houston
- 1983 Instructor, Dept. of Cell Biology, Baylor College of Medicine, Houston

Honor and Awards

- 1976-1979 NRSA Predoctoral Trainee, Dept. of Microbiology, University of Arizona College of Medicine, Tucson, AZ (David Mount, mentor)
- 1980-1982 NIH Individual Postdoctoral Fellowship, Dept. of Cell Biology, Baylor College of Medicine, Houston (Bert O'Malley, mentor)

Research Support

Previous

1R01 AI110001

Optimizing Beta-adrenoceptor Signaling Bias in Asthma

Principal investigators: Richard A. Bond, Julia K.L. Walker and Raymond B. Penn;

Brian J. Knoll: collaborating investigator

Total direct costs: \$2,350,000 (\$80,000 to BJK in years 1 and 2) 07/01/14 – 06/31/19.

2R56AI079236

Mechanisms of Beta-blocker Induced Improvements in Asthma (Bridge funding)

Principal investigators: **Brian J. Knoll**, Burton F. Dickey, Richard A. Bond and Julia Walker.

Total direct costs: \$352,800. 04/15/12 – 08/31/13.

University of Houston, Provost's Undergraduate Research Scholarship (PURS), Adedoyin Okulate, fellow.

Epithelial β_2AR signaling in mucin production.

Brian J. Knoll, advisor

Total direct costs: \$1,000. 01/17/12 – 04/30/12.

University of Houston, Summer Undergraduate Research Fellowship (SURF), Adedoyin Okulate, fellow.

The role of airway epithelial β_2AR signaling in asthma pathogenesis

Brian J. Knoll, advisor

Total direct costs: \$3,500. 06/01/11 – 08/15/11.

University of Houston, Grant to Enhance and Advance Research (GEAR)

Sorting Nexins in β_2AR Postendocytic Traffic

Brian J. Knoll, Principal Investigator

Total direct costs: \$25,337. 09/01/05 – 08/31/06

Sandler Program for Asthma Research

Effects of β -adrenoceptor Inverse Agonist Treatment on a Murine Asthma Model

Richard A. Bond, Principal Investigator; **Brian J. Knoll**, collaborating investigator

Total direct costs: \$250,000. 07/01/03 - 06/30/06

American Heart Association, Texas Affiliate 0455072Y

Sorting Motif in the β_2 -adrenergic Receptor 4th Cytoplasmic Domain

Brian J. Knoll, Principal Investigator

Total direct costs: \$124,000. 07/01/04 - 06/30/06

NIH R01 HL50047

Role of Small GTPases in Lung β -receptor Regulation

Brian J. Knoll, Principal Investigator.

Total direct costs \$1,338,481. 06/01/96 - 05/30/04

NIH R01 HL/AI57445

Endocytosis and Regulation of β -adrenergic Receptors

Brian J. Knoll, Principal Investigator.

Total direct costs, \$402,169. 12/01/98 - 11/30/02

NIH K08 HL03463

Mechanisms of β_2 -adrenoceptor Downregulation

Clinical Investigator Development Award to Robert H. Moore, M.D.

Brian J. Knoll, co-mentor (with Burton F. Dickey, M.D.) Total direct costs, \$400,828. 06/01/96 - 05/31/01

NIH F32 HL10150

Partial Agonists and β -adrenoceptor Endocytosis Individual

fellowship to Jennifer L. Rosenfeld, Ph.D. **Brian J. Knoll**, co-

mentor (with Richard B. Clark, Ph.D.) Total direct costs, \$75,068. 01/01/99 - 12/31/00

American Heart Association, Texas Affiliate, 92G-206

Role of Small GTPases in Receptor Mediated Endocytosis

Brian J. Knoll, Principal Investigator.

Total direct costs, \$70,400. 07/01/92 - 06/30/94

NIH R01 CA 47359

AFP Gene Expression in Carcinogenesis

Stewart Sell, Principal Investigator; **Brian J. Knoll**, Collaborating Investigator. Total direct costs, \$279,419. 08/01/88 - 07/31/91.

NIH R01 CA 46763

Tissue-specific and Neoplastic Gene Expression

Brian J. Knoll, Principal Investigator.

Total direct costs, \$242,021. 02/01/88 - 01/31/91

NIH R01 CA 34320

Gene Expression in Liver Carcinogenesis

Brian J. Knoll, Principal Investigator.

Total direct costs, \$210,637. 04/01/85 - 03/31/88.

American Cancer Society

Structure and Regulation of the Placental Alkaline Phosphatase Gene

Brian J. Knoll, Principal Investigator.

Total direct costs, \$130,000. 01/01/85 - 12/31/86

University of Texas Biomedical Research Support Grant *Isolation of Human Alkaline Phosphatase Genes* **Brian J. Knoll**,

Principal Investigator.

Total direct costs: \$6,430. 04/01/84 - 03/31/85

NIH F32GM007934

Regulation Of Gene Expression By Steroid Hormones

Brian J. Knoll, Postdoctoral Trainee (Bert O'Malley, mentor) Total direct costs: \$24,000. 09/01/80 – 08/31/82.

Review activities

Editorial Boards

2009-2012 British Journal of Pharmacology
2012- PLoS One

Journal Referee

- American Journal of Pathology
- Archives of Biochemistry and Biophysics
- Biochemical Pharmacology
- Biochemistry
- Biochimica et Biophysica Acta (Biomembranes)
- British Journal of Pharmacology
- Cancer Research
- Clinical and Experimental Allergy
- Drug Safety
- Endocrinology
- Experimental Cell Research
- FASEB Journal
- Food and Nutrition Research
- Journal of Biological Chemistry
- Journal of Cell Science
- Journal of Cellular Physiology
- Journal of Clinical Immunology
- Journal of Pharmacology and Experimental Therapeutics
- International Journal of Biochemistry & Cell Biology
- Naunyn Schmiedeberg's Archives of Pharmacology
- Life Sciences
- Lung
- Molecular Pharmacology
- Placenta
- PLoS One
- Proceedings of the National Academy Science, U.S.A

Review Panels

2014-2018 National Science Foundation, Graduate Student Research Fellowship
2005 University of Houston, Texas Advanced Research Program (ARP) Biological Sciences Internal Review Committee
1999-2002 American Heart Association, Western States Affiliate Peer Review Consortium (Review grant and fellowship proposals to Western States and Texas Affiliates).
1991-1998 American Heart Association, Texas Affiliate, Central Research Review Committee (Review grant proposals to Texas Affiliate).
1994-1996 Basic Sciences Subcommittee, Research Committee, Houston VA Medical Center (Review grant proposals to the Department of Veteran's Affairs)

Ad hoc Grant Reviews

- National March of Dimes Foundation
- United States Department of Agriculture
- Gulf Coast Regional Blood Center
- National Science Foundation
- The Wellcome Trust
- American Association of Colleges of Pharmacy

Professional Societies

- American Society for Pharmacology and Experimental Therapeutics
- American Association of Colleges of Pharmacy

Publications

Papers and Chapters

1. **Knoll, B.J.** (1979). An analysis of repressor overproduction by the λ cIII_s mutant. *J. Mol. Biol.* **132**: 551-555.
2. **Knoll, B.J.** (1979). Isolation and characterization of mutations in the cIII gene of bacteriophage λ which increase the efficiency of lysogenization of Escherichia coli K-12. *Virology.* **92**: 518-531.
3. Colbert, D.A., **Knoll, B.J.**, Woo, S.L., Mace, M.L., Tsai, M.J. & O'Malley, B.W. (1980). Differential hormonal responsiveness of the ovalbumin gene and its pseudogenes in the chick oviduct. *Biochemistry.* **19**: 5586-5592.
4. **Knoll, B.J.** (1980). Interactions of the λ cIII_s1 and E. coli hfl-1 mutations. *Virology.* **105**: 270-272.
5. Cohen, S., **Knoll, B.J.**, Little, J.W. & Mount, D.W. (1981). Preferential cleavage of phage λ repressor monomers by recA protease. *Nature.* **294**: 182-184.
6. **Knoll, B.J.**, Woo, S.L., Beattie, W. & O'Malley, B.W. (1981). Identification and sequence analysis of the 5' domain of the X and Y pseudo-ovalbumin genes. *J. Biol. Chem.* **256**: 7949-7953.
7. Lawson, G.M., **Knoll, B.J.**, March, C.J., Woo, S.L., Tsai, M.J. & O'Malley, B.W. (1982). Definition of 5' and 3' structural boundaries of the chromatin domain containing the ovalbumin multigene family. *J. Biol. Chem.* **257**: 1501-1507.
8. Dean, D.C., **Knoll, B.J.**, Riser, M.E. & O'Malley, B.W. (1983). A 5'-flanking sequence essential for progesterone regulation of an ovalbumin fusion gene. *Nature.* **305**: 551-554.
9. **Knoll, B.J.**, Zarucki-Schulz, T., Dean, D.C. & O'Malley, B.W. (1983). Definition of the ovalbumin gene promoter by transfer of an ovalglobin fusion gene into cultured cells. *Nucleic Acids Res.* **11**: 6733-6754.
10. Dean, D.C., Gope, R., **Knoll, B.J.**, Riser, M.E. & O'Malley, B.W. (1984). A similar 5'-flanking region is required for estrogen and progesterone induction of ovalbumin gene expression. *J. Biol. Chem.* **259**: 9967-9970.

11. Henthorn, P.S., **Knoll, B.J.**, Raducha, M., Rothblum, K.N., Slaughter, C., Weiss, M., Lafferty, M.A., Fischer, T. & Harris, H. (1986). Products of two common alleles at the locus for human placental alkaline phosphatase differ by seven amino acids. *Proc. Natl. Acad. Sci. U. S. A.* **83**: 5597-5601.
12. **Knoll, B.J.**, Longley, M. & Sell, S. (1986). Cloning of a cDNA encoding the rat placental glutathione S-transferase: overproduction of the mRNA in hepatocellular carcinomas. *Tumour Biol.* **7**: 123-135.
13. **Knoll, B.J.**, Rothblum, K.N. & Longley, M. (1987). Two gene duplication events in the evolution of the human heat-stable alkaline phosphatases. *Gene.* **60**: 267-276.
14. Sell, S., Hunt, J.M., **Knoll, B.J.** & Dunsford, H.A. (1987). Cellular events during hepatocarcinogenesis in rats and the question of premalignancy. *Adv. Cancer Res.* **48**: 37-111.
15. **Knoll, B.J.**, Rothblum, K.N. & Longley, M. (1988). Nucleotide sequence of the human placental alkaline phosphatase gene. Evolution of the 5' flanking region by deletion/substitution. *J. Biol. Chem.* **263**: 12020-12027.
16. Povinelli, C.M. & **Knoll, B.J.** (1991). Trace expression of the germ-cell alkaline phosphatase gene in human placenta. *Placenta.* **12**: 663-668.
17. **Knoll, B.J.**, (1992). Gene expression in the human placental trophoblast: a model for developmental gene regulation. *Placenta.* **13**: 311-327.
18. Povinelli, C.M., Stewart, J.M. & **Knoll, B.J.** (1992). Differential and coordinate responses of the human genes encoding the heat stable alkaline phosphatases to cAMP and sodium butyrate in the choriocarcinoma line JEG-3. *Biochim. Biophys. Acta.* **1115**: 243- 251.
19. Sell, S. & **Knoll, B.J.** *Transgenic mouse models of hepatocarcinogenesis*. In: The Role of Cell Types in Hepatocarcinogenesis A.E. Sirica, Ed. 1992, CRC Press: Boca Raton, FL. p. 299-321.
20. Mathew, J.K., **Knoll, B.J.**, Pillai, A., Durham, D. & Sell, S. (1994). Discrete cell-type specific enhancer regions 5' of the rat alphafetoprotein gene: Identification of a highly active distal enhancer. *J. Tumor Marker Oncol.* **9**: 21-28.
21. Ghebranious, N., **Knoll, B.J.**, Wu, H., Lozano, G. & Sell, S. (1995). Characterization of a murine p53ser246 mutant equivalent to the human p53ser249 associated with hepatocellular carcinoma and aflatoxin exposure. *Mol. Carcinog.* **13**: 104-111.
22. Ghebranious, N., **Knoll, B.J.**, Yavorkovsky, L., Ilic, Z., Papaconstantinou, J., Lozano, G. & Sell, S. (1995). Developmental control of transcription of the CAT reporter gene by a truncated mouse alphafetoprotein gene regulatory region in transgenic mice. *Mol. Reprod. Dev.* **42**: 1-6.
23. Hoffenberg, S., Nikolova, L., Pan, J.Y., Daniel, D.S., Wessling-Resnick, M., **Knoll, B.J.** & Dickey, B.F. (1995). Functional and structural interactions of the Rab5 D136N mutant with xanthine nucleotides. *Biochem. Biophys. Res. Commun.* **215**: 241-249.
24. Hoffenberg, S., Sanford, J.C., Liu, S., Daniel, D.S., Tuvin, M., **Knoll, B.J.**, Wessling-Resnick, M. & Dickey, B.F. (1995). Biochemical and functional characterization of a recombinant GTPase, Rab5, and two of its mutants. *J. Biol. Chem.* **270**: 5048-5056.
25. Moore, R.H., Sadovnikoff, N., Hoffenberg, S., Liu, S., Woodford, P., Angelides, K., Trial, J.A., Carsrud, N.D., Dickey, B.F. & **Knoll, B.J.** (1995). Ligand-stimulated β_2 -adrenergic receptor internalization via the constitutive endocytic pathway into rab5-containing endosomes. *J. Cell Sci.* **108**: 2983-2991.

26. Morrison, K.J., Moore, R.H., Carsrud, N.D., Trial, J., Millman, E.E., Tuvim, M., Clark, R.B., Barber, R., Dickey, B.F. & **Knoll, B.J.** (1996). Repetitive endocytosis and recycling of the β_2 -adrenergic receptor during agonist-induced steady state redistribution. *Mol. Pharmacol.* **50**: 692-699.
27. January, B., Seibold, A., Allal, C., Whaley, B.S., **Knoll, B.J.**, Moore, R.H., Dickey, B.F., Barber, R. & Clark, R.B. (1998). Salmeterol-induced desensitization, internalization and phosphorylation of the human β_2 -adrenoceptor. *Br. J. Pharmacol.* **123**: 701-711.
28. Clark, R.B., **Knoll, B.J.** & Barber, R. (1999). Partial agonists and G protein-coupled receptor desensitization. *Trends Pharmacol Sci.* **20**: 279-286.
29. Moore, R.H., Hall, H.S., Rosenfeld, J.L., Dai, W. & **Knoll, B.J.** (1999). Specific changes in β_2 -adrenoceptor trafficking kinetics and intracellular sorting during downregulation. *Eur. J. Pharmacol.* **369**: 113-123.
30. Moore, R.H., Tuffaha, A., Millman, E.E., Dai, W., Hall, H.S., Dickey, B.F. & **Knoll, B.J.** (1999). Agonist-induced sorting of human β_2 -adrenergic receptors to lysosomes during downregulation. *J. Cell Sci.* **112 (Pt 3)**: 329-338.
31. Tuvim, M.J., Adachi, R., Chocano, J.F., Moore, R.H., Lampert, R.M., Zera, E., Romero, E., **Knoll, B.J.** & Dickey, B.F. (1999). Rab3D, a small GTPase, is localized on mast cell secretory granules and translocates to the plasma membrane upon exocytosis. *Am. J. Respir. Cell Mol. Biol.* **20**: 79-89.
32. Hoffenberg, S., Liu, X., Nikolova, L., Hall, H.S., Dai, W., Baughn, R.E., Dickey, B.F., Barbieri, M.A., Aballay, A., Stahl, P.D. & **Knoll, B.J.** (2000). A novel membrane-anchored Rab5 interacting protein required for homotypic endosome fusion. *J. Biol. Chem.* **275**: 24661-24669.
33. Seibold, A., Williams, B., Huang, Z.F., Friedman, J., Moore, R.H., **Knoll, B.J.** & Clark, R.B. (2000). Localization of the sites mediating desensitization of the β_2 -adrenergic receptor by the GRK pathway. *Mol. Pharmacol.* **58**: 1162-1173.
34. Rosenfeld, J.L., Moore, R.H., Zimmer, K.P., Alpizar-Foster, E., Dai, W., Zarka, M.N. & **Knoll, B.J.** (2001). Lysosome proteins are redistributed during expression of a GTP-hydrolysis-defective rab5a. *J. Cell Sci.* **114**: 4499-4508.
35. Clark, R.B. & **Knoll, B.J.** (2002). Measurement of receptor desensitization and internalization in intact cells. *Methods Enzymol.* **343**: 506-529.
36. Rosenfeld, J.L., **Knoll, B.J.** & Moore, R.H. (2002). Regulation of G-protein-coupled receptor activity by rab GTPases. *Receptors Channels.* **8**: 87-97.
37. Liu, Q., Reubi, J.C., Wang, Y., **Knoll, B.J.** & Schonbrunn, A. (2003). *In vivo* phosphorylation of the somatostatin 2A receptor in human tumors. *J. Clin. Endocrinol. Metab.* **88**: 6073-6079.
38. Moore, R.H. & **Knoll, B.J.**, *Cellular Trafficking of β_2 -adrenergic Receptors* In: Therapeutic Targets in Airway Inflammation, N.T. Eissa and D. Huston, Eds. 2003, Marcel Dekker: New York.
39. Callaerts-Vegh, Z., Evans, K.L., Dudekula, N., Cuba, D., **Knoll, B.J.**, Callaerts, P.F., Giles, H., Shardonofsky, F.R., & Bond, R.A. (2004). Effects of acute and chronic administration of β -adrenoceptor ligands on airway function in a murine model of asthma. *Proc. Natl. Acad. Sci. U. S. A.* **101**: 4948-4953.

40. Millman, E.E., Rosenfeld, J.L., Vaughan, D.J., Nguyen, J., Dai, W., Alpizar-Foster, E., Clark, R.B., **Knoll, B.J.** & Moore, R.H. (2004). Endosome sorting of β_2 -adrenoceptors is GRK5 independent. *Br. J. Pharmacol.* **141**: 277-284.
41. Moore, R.H., Millman, E.E., Alpizar-Foster, E., Dai, W. & **Knoll, B.J.** (2004). Rab11 regulates the recycling and lysosome targeting of β_2 -adrenergic receptors. *J. Cell Sci.* **117**: 3107-3117.
42. Iyer, V., Tran, T.M., Foster, E., Dai, W., Clark, R.B. & **Knoll, B.J.** (2006). Differential phosphorylation and dephosphorylation of β_2 -adrenoceptor sites Ser262 and Ser355,356. *Br. J. Pharmacol.* **147**: 249-259. (with editorial commentary, 147: 235-236).
43. Vaughan, D.J., Millman, E.E., Godines, V., Friedman, J., Tran, T.M., Dai, W., **Knoll, B.J.**, Clark, R.B. & Moore, R.H. (2006). Role of the G protein-coupled receptor kinase site serine cluster in β_2 -adrenergic receptor internalization, desensitization, and β -arrestin translocation. *J. Biol. Chem.* **281**: 7684-7692.
44. Moore, R.H., Millman, E.E., Godines, V., Hanania, N.A., Tran, T.M., Peng, H., Dickey, B.F., **Knoll, B.J.** & Clark, R.B. (2007). Salmeterol stimulation dissociates β_2 -adrenergic receptor phosphorylation and internalization. *Am. J. Resp. Cell Molec. Biol.* **36**: 254-261
45. Tran, T.M., Friedman, J., Baameur, J.F., **Knoll, B.J.** & Clark, R.B. (2007). Dissociation of β_2 -adrenergic receptor resensitization from dephosphorylation of the PKA and GRK sites. *Molec. Pharmacol.* **71**: 47-60.
46. Awwad, H., Iyer, V., Rosenfeld, J.L., Millman, E.E., Moore, R.H & **Knoll, B.J.** (2007). Inhibitors of phosphoinositide 3-kinase cause defects in the postendocytic sorting of β_2 -adrenergic receptors. *Exp. Cell Res.* **313**: 2586-2596
47. Nguyen, L.P, Omoluabi, O., Parra, S., Frieske, J.M., Clement, C., Ammar-Aouchiche, Z., Ho, S., **Knoll, B.J.**, Tuvim, M.J., Dickey, B.F. & Bond, R.A. (2008). Chronic exposure to beta-blockers attenuates inflammation and mucin content in a murine asthma model. *Am. J. Resp. Cell Molec. Biol.* **38**:256-262
48. Lin, R., Peng, H., Nguyen, L.P., Dudekula, N.B., Shardonofsky, F., **Knoll, B.J.**, Parra, S. & Bond, R.A. (2008). Changes in β_2 adrenoceptor and other signaling proteins produced by chronic administration of 'beta-blockers' in a murine asthma model. *Pulm. Pharmacol. Therapeut.* **21**:115-124
49. Millman, E.E., Zhang, H., Zhang, H., Godines, V., Bean, A.J., **Knoll, B.J.** & Moore, R.H. (2008). Rapid recycling of β_2 -adrenergic receptors is dependent on the actin cytoskeleton and myosin Vb. *Traffic* **9**:1958-1971.
50. Nguyen, L.P., Lin, R., Omoluabi, O., Hanania, N.A., Tuvim, M.J., **Knoll, B.J.**, Dickey, B.F. & Bond, R.A. (2009) β_2 -adrenoceptor signaling is required for the development of the asthma phenotype in a murine model. *Proc.Nat. Acad. Sci. U.S.A.* **106**: 2435-2440.
51. Awwad, H.O., Moore, R.H., Millman, E.E. & **Knoll, B.J.** (2010). Mutating the dileucine motif of the human β_2 -adrenoceptor reduces the high initial rate of receptor phosphorylation by GRK without affecting postendocytic sorting. *Eur. J. Pharmacol.* **635**:9-15.
52. Peng, H., Bond, R.A. & **Knoll, B.J.** (2011). The effects acute and chronic nadolol treatment on β_2 AR signaling in HEK293 cells. *Naunyn-Schmiedeberg Arch. Pharmacol.* **383**:209-216.

53. Thanawala, J.T., Forkuo, G.S., Al-Sawalha, N., Azzegagh, Z., Nguyen, L.P., Eriksen, J.L., Tuvim, M.J., Lowder, T.W., Dickey, B.F., **Knoll, B.J.**, Walker, J.K.L. & Bond R.A. (2013) β_2 -adrenoceptor agonists are required for development of the asthma phenotype in a murine model. *Am. J. Resp. Cell Molec. Biol.* **48**:220-229
54. Al-Sawalha, N., Pokkunuri, I., Omoluabi, O., Kim, H., Thanawala, V.J., Hernandez, A. Bond, R.A. & **Knoll, B.J.** (2015). Epinephrine activation of the β_2 -adrenoceptor is required for IL-13 induced mucin production in human bronchial epithelial cells. *PLoS One*, **10**:e0132559
55. Thanawala, V., Valdez, D., Joshi, R., Forkuo, G., Parra, S., **Knoll, B.J.**, Bouvier, M., Leff, P. & Bond, R.A. (2015). β -blockers have differential effects on the murine asthma phenotype. *Brit. J. Pharmacol.* **172**:4833-4846.
56. Forkuo, G.S., Kim, H., Thanawala, V.J., Al-Sawalha, N., Valdez, D., Joshi, R., Parra, S., Pera, T., Gonnella, P.A., **Knoll, B.J.**, Walker, J.K.L., Penn, R.B. & Bond, R.A. (2016). Phosphodiesterase 4 inhibitors attenuate the asthma phenotype produced by β_2 -adrenoceptor agonists in PNMT-knockout mice. *Am. J. Resp. Cell Molec. Biol.* **55**:234-242
57. Al-Sawalha, N.A. & Knoll B.J. (2016) Statins in asthma: A closer look into the pharmacological mechanism of action. *Pharmacology* 98:279-283.
58. Nguyen, L.P., Al-Sawalha, N.A., Parra, S., Pokkunuri, I., Omoluabi, O., Okulate, A.A., Li, E.W., Hazen, M., Gonzales-Granado, J.M., Daly, C.J., McGrath, J.C., Tuvim, M.J., **Knoll, B.J.**, Dickey, B.F. & Bond, R.A. (2017) β_2 -Adrenoceptor signaling in airway epithelial cells promotes eosinophilic inflammation, mucous metaplasia, and airway contractility. *Proc.Nat. Acad. Sci. U.S.A.* 114: E9163-E9171.
59. Joshi, R., Valdez, D., Kim, H., Eikenburg, D.C., Knoll, B.J. & Bond, R.A. (2017) Effects of β -blockers on house dust mite-driven murine models pre- and post-development of an asthma phenotype. *Pulm. Pharmacol. Therap.* 46:30-40.

Teaching Activity

Didactic Courses

University of Houston, College of Pharmacy, Pharm. D. Program

- 2001- 2018 PHAR 4301 Cellular Life Sciences II, Director and 30 hrs of lecture
2019- PHAR 4200 Immunology, Director and 26 hrs of lecture
2020- PHAR 5236 Integrated Immunology/Rheumatology Module, co-Director and 7 hrs of lecture
2020- PHAR 5226 Integrated Respiratory Module, 2 hrs of lecture

University of Houston, College of Pharmacy, Bachelor of Pharmaceutical Sciences Program

- 2009-2010 Immunopharmacology, Director and 30 hrs of lecture

University of Houston, Dept. of Pharmacological & Pharmaceutical Sciences, Ph.D. Program

- 2001- PCOL 7350 Cellular Pharmacology, 4 hrs of lecture
2001- PCOL 7333 Molecular Pharmacology, 21 hrs as group facilitator
2020- PCOL 7370 Scientific Writing, 9 hrs as group facilitator

Baylor College of Medicine

- 1993 Graduate Student Seminar, Dept. of Cell Biology, 8 hrs with students
1993-1996 Core Curriculum Course, 1st Year Subspecialty Fellows, Dept. of Medicine, Director and 5 hrs lecture
1996-2000 Transmembrane Signaling and Ion Channels, Dept. of Molecular Physiology and Biophysics, Director and 3 hrs lecture
1998 Research Design, 12 hrs as group facilitator
1999 Integrated Problem Solving, 50 hrs as group facilitator

University of Texas Medical School, Houston

- 1984-1990 Pathology (Genetic Disease), 3 hr lecture/yr
1985-1990 Immunology (Molecular Immunology), 6 hr lecture/yr

University of Texas Graduate School of Biomedical Sciences, Houston

- 1984-1992 Eukaryotic Gene Regulation, 6 hrs lecture/yr
1989-1992 Molecular & Cellular Approaches to Human Genetics, 3 hrs lecture/yr
1990 Basic Biochemistry, 4 hrs lecture

Research Fellow Training

University of Houston, Department of Pharmacological and Pharmaceutical Sciences

- Jennifer L. Rosenfeld, Ph.D., 12/97 - 10/02
- Xiaoling Liu, Ph.D., 09/98 - 04/03
- Indira Pokkunuri, Ph.D. 09/09 – 09/11

Baylor College of Medicine

- William Rodriguez, M.D., 09/91 - 05/92
- Nicholas Sadovnikoff, M.D., 07/92 - 06/93
- Adnan Khan, M.D., 08/94 -12/95
- Robert Lampert, M.D., 01/93 - 06/96
- Xijie Lu, Ph.D., 09/95- 09/97
- Amjad Tuffaha, M.D. 09/96-07/98

The University of Texas Health Sciences Center, Houston

- Christine Povinelli, Ph.D., 04/88 - 02/91
- Joseph Mathew, Ph.D., 06/88 - 08/91

Graduate Student Training

University of Houston, Department of Pharmacological and Pharmaceutical Sciences

- Hatice Ozsoy, Ph.D. committee, 05/05 -6/06
- Noor Dudekula, M.S., committee, 08/05 – 07/06
- Rui Lin, Ph.D., co-chair with Richard Bond, 5/05 – 8/08
- Long Nguyen, Ph.D., committee 2005-2009
- Varsha Iyer, Ph.D. 07/00 - 12/05 Chair
- Aarti Gohkale, Ph.D., committee, 05/05
- Hibah O. Awwad, Ph.D. 01/01 – 05/05 Chair
- Vikas Arora, M.S., co-chair with Richard Bond, 01/03 – 06/04
- Rashim Singh, Ph.D., rotation, 2004
- Juli Jamison, M.S. 01/01 - 04/03 Chair
- Khaled Al-Hosaini, M.S., 10/00 - 10/01
- Aditi Khera, Ph.D., rotation, 2001
- Kaustuv Saha, Ph.D., committee, 01/08 – 12/11
- Renu Singh, Ph.D., committee, 07/07 – 05/11
- Nour Al-Sawalha, Ph.D., 03/10 – 08/13, Chair
- Vaidehi Thanawala, Ph.D., co-chair with Richard Bond, 01/12 - 8/14
- Gloria Forkuo, Ph.D., co-chair with Richard Bond, 01/12 - 12/14
- Hosu Kim, co-chair with Richard Bond, 02/15-

University of Houston, Department of Biology and Biochemistry

- Ozozoma Omoluabi, Ph.D., co-chair with Richard Bond, 2005-2009
- Alen Chen, Ph.D. candidate, supervisory committee, 2007
- Yu-Hsin Chiu, Ph.D. candidate, supervisory committee, 2006-2010
- Hui Peng, Ph.D., co-chair with Richard Bond, 2004-2008
- Vijay Gupta, Ph.D., supervisory committee, 2003 - 2005
- Prashant Jain, Ph.D., supervisory committee, 2003 - 2005
- Linah Al-Alem, M.S., rotation 2003

Baylor College of Medicine

- Antonia Vlahou, Ph.D., Dept. of Cell Biol., Oral Candidacy Examining Committee, 12/93
- Hsiang-Po Huang, Ph.D., Dept. of Cell Biol., Examining Committee, 12/95
- Laura Mackey, Ph.D. Dept. of Molec. Physiol. & Biophys., Committee, 01/98 - 09/00
- Keith Weiser, Ph.D., Prog. in Cell & Molec. Biol., Rotation, 10/98 - 12/98
- Alison Woo, Ph.D., Prog. in Cell & Molec. Biol., Qualifying Exam, 11/98
- Rick Deibler, Ph.D., Prog. in Cell & Molec. Biol., Qualifying Exam, 11/98
- Mingyang Huang, Ph.D., Dept. of Molec. Physiol. & Biophys., Rotation, 09/99 - 11/99
- Aslihan Koksoy, Ph.D., Dept. of Molec. Physiol. & Biophys., Rotation, 01/97 - 03/97; Committee, 06/97 - 06/00
- Wei Tang, Ph.D., Dept. of Molec. Physiol. & Biophys., Rotation, 01/98 - 03/98; Committee, 06/98 - 03/03
- Hulusi Cinar, Ph.D. , Div. of Neuroscience, Committee, 01/98 - 08/01
- Matthew Sowa, Ph.D., Prog. in Struct. & Comput. Biol. and Molec. Biophys., Committee, 11/98 - 06/00
- Ajay Guatam, Ph.D. Dept. of Molec. Physiol. & Biophys., Rotation, 03/99 - 05/99; Committee 06/99 - 08/01
- Dasein Pinto-Gonzalez, Ph.D., Dept. of Immunol., Committee, 06/00 – 11/03
- Yue Wei, Ph.D., Dept. of Molec. Physiol. & Biophys., Committee 06/99 – 08/03

The University of Texas Graduate School of Biomedical Sciences, Houston:

- Frank Fasullo, Ph.D. , research rotation, 1985
- Paul Kussie, Ph.D., Final Examining Committee, 1986
- Ennio Chiocca, Ph.D., Final Examining Committee, 1987
- Joseph Rodriguez, Ph.D., Research rotation, 1988
- Jon Johnson Ph.D., research rotation, 1989
- Anand Lagoo, Ph.D., Final Examining Committee, 1990
- Justin Mulloy, Ph.D., Advisory Committee, 1990
- F. Janine Abbott, M.S., Final Examining Committee, 1991
- Nanyong Yuan, Ph.D., Oral Candidacy Committee, 1994
- Nader Ghebraniou, Ph.D., Oral Candidacy and Supervisory Committees, 1994
- Andrej Krumins, Ph.D. Final Examining Committee, 1995

The University of Texas Medical Branch, Galveston

- David Strick, Ph.D., Supervisory and Examining Committee, 2003 – 2005

Undergraduate Student Training

SMART Program, Baylor College of Medicine

- Edward Esparza (Princeton University, Princeton, NY), Summer 1997
- Peter Campbell (Imperial College, London), Summer 1998
- Menjing Huang (Rice University, Houston, TX), Summer 1999

Summer Undergraduate Research Fellow (SURF), University of Houston

- Nour Alzein, summer 2006
- Adedoyin Okulate, summer 2011
-

Provost Undergraduate Research Scholarship (PURS)

- Adedoyin Okulate, spring 2012

Alliances for Graduate Education and the Professoriate (AGEP), University of Houston

- Florence Okonkwo, Summer 2006

Federal work-study

- LaKesla Iles, fall 2004 – spring 2008
- Adedoyin Okulate, fall 2011

Other Training Activities

- Graduate Student Research Day, Baylor College of Medicine: Judge posters, 2001
- Sigma Xi Research Day, University of Houston: Judge posters, 2004
- Graduate Student Research Day, Baylor College of Medicine: Judge platform talks, 2005
- Sigma Xi Research Day, University of Houston: Judge posters, 2005
- Undergraduate Research Symposium, University of St. Thomas, Houston, TX: Judge Posters, 2006
- Graduate Student Research Day, Baylor College of Medicine: Judge platform talks, Oct 2009
- 7th Annual American Medical Association, Medical Student Section/Resident and Fellow Section, Joint Research Symposium, AMA Interim Meeting, Houston, TX, Oct 2009: Judge posters
- National Student Research Forum, Galveston, TX, Apr 2009-2021: Judge posters, platform talks

Service Activity

Departmental Administration and Committees

University of Houston, College of Pharmacy, Department of Pharmacological and Pharmaceutical Sciences

- 2003 Chair, Search Committee for Faculty and Chair of PPS
- 2004-2006 Member, Committee for PPS Pharmacology Faculty Recruitment 2006-
Director of Graduate Education, Ph.D. program
- 2006-2011 Member, Committee for PPS Medicinal Chemistry Faculty Recruitment
- 2000-2006 Member, Graduate Education Committee
- 2013-2015 Member, Committee for PPS Immunology Faculty Recruitment

Baylor College of Medicine

- 1993-1996 Chair, Subspecialty Fellow Basic Sciences Training
Committee, Dept. of Medicine
- 1994-1996 Member, Basic Sciences Subcommittee, Research Committee, Houston
VA Medical Center
- 1996-1998, Chair, Graduate Student Recruiting Committee, Dept. of Molecular
Physiology & Biophysics
- 1998-1999 Member, Graduate Education Committee, Dept. of Molecular
Physiology & Biophysics
- 1999-2000 Graduate Program Director, Dept. of Molecular Physiology & Biophysics

The University of Texas Health Sciences Center, Houston

1985-1989 Chair, Space and Equipment Committee, Dept. of Pathology & Laboratory Medicine

College and University Administration and Committees

University of Houston College of Pharmacy

2000- Member, Research Committee
2001-2004 Member, Assessment Task Force
2002-2010 Member, Pharm.D./Ph.D. Advisory Committee
2003-2006 Chair, Graduate Studies Committee
2004 Member, Post-tenure Review Committee
2010-2014 Chair, Faculty Advisory Council

University of Houston

2000- Member, Graduate and Professional Studies Council
2005-2006 Vice-chair, Graduate and Professional Studies Council
2005 Member, Research Excellence Task Force
2006-2007 Chair, Graduate and Professional Studies Council
2006-2007 Member, University Coordinating Council
2013 Member, Graduate Assistant Success Task Force

Baylor College of Medicine

1991-1994 Member, Biohazard Subcommittee of the Research Committee, Houston VA Medical Center
1992-1994 Chair, Biohazard Subcommittee of the Research Committee, Houston VA Medical Center
1996-2000 Recombinant DNA Subcommittee

The University of Texas Medical School, Houston

1988-1991 Member, Admissions Committee

The University of Texas Graduate School of Biomedical Sciences, Houston

1987-1990 Member, Admissions Committee