

**CURRICULUM VITAE of WILLIAM LEE SMITH, Jr.**

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**EDUCATION**

B.A., Chemistry, University of Colorado, 1967  
Ph.D., Biochemistry, University of Michigan, 1971  
Postdoctoral, Biochemistry, University of California, Berkeley, 1971-1974

**ACADEMIC APPOINTMENTS (First to Current)**

Senior Scientist, Mead Johnson and Company, Evansville, Indiana, 1974-1975  
Assistant Professor, Department of Biochemistry, Michigan State University, 1975-1979  
Associate Professor, Department of Biochemistry, Michigan State University, 1979-1983  
Visiting Professor, Department of Cell Biology, Baylor School of Medicine, 1985  
Adjunct Professor, Department of Physiology, Michigan State University, 1985-2003  
Professor, Department of Biochemistry, Michigan State University, 1983-2003  
Chairperson, Department of Biochemistry, Michigan State University, 1994-2002  
University Distinguished Professor, Department of Biochemistry, Michigan State University, 2001-2003  
University Distinguished Professor Emeritus, Michigan State University, 2003-present  
Professor and Chair, Department of Biological Chemistry, University of Michigan, May, 2003

**SOCIETY MEMBERSHIPS**

American Association for the Advancement of Science  
American Society of Biological Chemists  
American Physiological Society

**AREAS OF RESEARCH INTEREST**

Signal Transduction - Prostaglandin Receptors  
Prostaglandins and Renal Function  
Molecular Biology of Prostaglandin Biosynthetic Enzymes  
Lipids and Lipid Mediators

## FUNDED RESEARCH PROJECTS (Direct Costs)

05/01/76-04/30/79 -	Regulation of uterine prostaglandin biosynthesis. NIH (Grant No. HD-10013). Total: \$80,240; First Year: \$24,150
07/01/76-06/30/77 -	Subcellular localization of prostaglandin synthesis. ND-GRSP 15-1976, College of Osteopathic Medicine, MSU, \$3,400
08/01/78-07/31/81 -	Prostaglandin synthesis in kidney collecting tubules. NIH (Grant No. AM-22042). Total: \$104,513; First Year: \$32,351
02/01/80-01/31/83 -	Regulation of uterine prostaglandin biosynthesis. NIH (Grant No. HD-10013). Total: \$120,211; First Year: \$37,200
07/01/80-06/30/82 -	Monoclonal Antibodies Against Prostacyclin Synthetase. Michigan Heart Association. Total: \$27,788; First Year: \$13,900
07/01/81-06/30/86 -	Established Investigatorship. American Heart Association. Total: \$150,000; First year: \$30,000
08/01/81-07/31/84 -	Prostaglandin synthesis in kidney collecting tubules. NIH (Grant No. AM-22042). Total: \$151,072; First Year: \$47,238
02/01/83-01/31/86 -	Regulation of prostacyclin synthesis. NIH (Grant No. HL-29685). Total: \$214,638; First Year: \$65,715
08/01/84-07/31/87 -	Prostaglandin synthesis in kidney collecting tubules. NIH (Grant No. AM-22042). Total: \$206,333; First Year: \$64,911
07/01/85-07/01/87 -	Purification of PGE <sub>2</sub> Receptors. Michigan Heart Association. Total: \$35,000; First Year: \$17,500
10/01/85-09/30/88 -	Cell Biology of the Juxtaglomerular Apparatus (Co-PI). NIH (Grant No. HL35731). Total: \$182,700; First Year: \$62,130
02/01/86-01/31/88 -	Compartmentation of Prostaglandin Metabolism. NIH (Grant No. AM-36485). Total: \$70,826; First Year: \$36,572
07/01/88-06/30/91 -	Regulation of PGG/H Synthase Gene (Co-PI). NIH (Grant No. GM40713). Total: \$282,624; First Year: \$99,594
07/01/89-06/30/91 -	Substrate Binding Sites of Prostaglandin G/H Synthase. American Heart Assoc. of Michigan. Total: \$49,000; First Year: \$24,500
05/01/90-04/30/93 -	Catalysis by Prostaglandin G/H Synthase. NIH (Grant No. DK-42509). Total: \$266,460; First Year: \$88,660
08/01/87-07/31/95 -	Prostaglandin Synthesis in Kidney Collecting Tubules. NIH (Grant No. DK-22042). Total: \$937,285; First Year: \$102,800; NIH-MERIT Grant
06/01/93-05/31/98 -	Catalysis by Prostaglandin G/H Synthase. NIH (Grant No.

	DK-42509). Total: est. \$605,437; First Year: est. \$111,780
08/01/95-07/31/03 -	Prostaglandin Synthesis in Kidney Collecting Tubules. NIH (Grant No. DK-22042). Total: \$682,456 (First Five Years); First Year: \$126,000; NIH-MERIT Grant
06/01/98-05/31/03 -	Oxygen Utilizing Membrane Heme Proteins. Principal Investigator. NIH (Grant No. P01 GM57323). Total: ca. \$3.2 million; First Year: \$634,000; Program Project Grant
09/01/03-08/31/07 -	Catalysis by Prostaglandin Endoperoxide H Synthases. Principal Investigator. NIH (Grant No. R01 GM68848). Total: ca. \$1,240,000 (D.C.); First Year: \$304,992 D.C.
07/01/06-06/30/08 -	Heart and Stroke Foundation of Canada. Principal Investigator. Research Fellowship Award for Ranjinder Sidhu, Ph.D. The major goal of this research is to determine mechanisms of substrate discrimination by COX-1 and COX-2 by determining the crystal structures of COX-1, COX-2 and V349A COX-1 in complex with various $\omega$ 6 and $\omega$ 3 fatty acids.
09/01/07-08/31/11 -	Catalysis by Prostaglandin Endoperoxide H Synthases. Principal Investigator. NIH (Grant No. R01 GM68848). Total: ca. \$1,211,386 (D.C.); First Year: \$289,612 D.C.

#### TEACHING (Formal courses)

Year	Courses (Mich. St. Univ.)	# Lect.	# Labs	Disc. Sessions /wk
75-79	BCH 502-Med. Biochem.	20 (10-1978)	-	
76-80	Foc. Prb. (Track II)	-	-	4
76-78	BCH 805-Grad. Laboratory	3	7	
77	BCH 051	6	-	
78	BCH 804-Grad. Laboratory	3	7	
85	BCH 501-Med. Biochem.	15	-	
86	BCH 978-Seminar	10	-	
75-89	Systems Biology	2	-	
79-89	BCH 512-Med. Biochem.	20-25	-	
86-89	PSL 500E-Med. Physiol.	12	-	1
89	BCH 960-Signalling	10	-	
90	PSL 919-CV Physiol.	10	-	2
78-92	BCH 831-Physiol. Chem	3	-	
88-03	BCH 802-Grad. Biochem.	25	-	
89-94	BCH 829-Biochem. Meth.	4	-	
05	ChemBio 501-Structure	9		
06	BC550-Macro Structure	5		1
05-06	BC597- Critical Analysis	9		

## PROFESSIONAL ACTIVITIES

### Editorial and Society Activities:

IUB Eicosanoid Nomenclature Committee, Chair, 1987-  
 IUPHAR Eicosanoid Receptor Nomenclature Committee, 1990-94  
 Coeditor (with W.E.M. Lands) of *Methods in Enzymology*: "Prostaglandins and Arachidonate Metabolites," Volume 86, 1982  
 Editorial Board, *Hypertension*, 1981-1983  
 Editorial Board, *Journal of Biological Chemistry*, 1988-1993  
 Editorial Board, *Archives of Biochemistry and Biophysics*, 1988-1995  
 Editorial Board, *Biochimica Biophysica Acta*, 1996-00  
 Coeditor (with S. Yamamoto) of *Molecular Biology of the Arachidonate Cascade*, 1995, 2002  
 Exec. Editor, *Archives of Biochemistry and Biophysics*, 1996-2001  
 Editorial Board, Associate Editor, *Prostaglandins*, 1991-2008  
 Associate Editor, *Journal of Biological Chemistry*, 1999-present  
 Program Committee, 1996 ASBMB Meeting.  
 Chair, Gordon Conference on Biochemistry of Lipids and Lipid Mediators, 1997  
 COX-2 International Study Group, 1999-present  
 Biochemistry Chairs Association (AMGDB), Treasurer, 1996-99, Pres. elect/President, 1999-2001  
 Chair, 2001 Keystone Conference on Eicosanoid Lipid Mediators  
 Member, Am. Soc. Biochem. and Mol. Biol. (ASBMB) Council, 2003-2005  
 ASBMB China Delegation, 2007

### Consultantships

American Heart Association Of Michigan	Board of Directors, 1992- (Vice President, 1995-96, President-elect, 1996-97; President, 1997-98) - Research Grants Committee, 1981-82, 1989-present (vice-chair, 1990-91; chair 1991-95) - Research Executive Committee, 1981-82, 1990-present (vice-chair, 1991-93; chair, 1992-94) - Research Fellowship Committee, 1979-1981, 1985-90 - Research Forum Committee, 1982-83
NIH	- "Prostaglandin Antagonists," Washington, D.C., April 27-28, 1978, NIHLB Review Panel - ad hoc reviewer for Biochemistry, Reproductive Biology, Physiological

- Chemistry, Endocrinology study sections, 1980, 1981, 1982, 1983, 1984, 1986, 1987
- Site Visits: Univ. of Oklahoma, February 1, 1983, for Reproductive Biology Study Section; Vanderbilt University for Biochemistry Study Section, March 25, 1980; for NIHLBI to Henry Ford Hospital, October 20-22, 1986; for NIDDKD to University of Colorado, October 29-31, 1986; for NIDDKD to Case Western University, October 28-30, 1987; for NIHLB to University of Pennsylvania, November 2-4, 1987; for NIHLB to New York Medical College, February 1, 1990; for NIDDK to Washington University, July 22-24, 1991; for NIDDK to Vanderbilt University, April 11-13, 1993; for NIGMS to Vanderbilt University, July 29, 1995; for NIDDK to MGH, December 16-18, 1996.
  - Special Review Comm. - NIAADDK, November 20, 1984; NIEHS Review, March 23-34, 2003.
  - Biochemistry II Study Section, 1981-1986
  - CSRS-AES Review, Department of Biochemistry, University of Nevada, Reno, October 3-5, 1989; Vanderbilt Biochemistry Dept. Review, January 5-7, 2000
- Miscellaneous
- Oxford Biomed. Res., Inc. 1984-2004
  - DuPont Merck 1991-1993
  - Allergan 1990-93, 95, 2001, 2003
  - Roche Bioscience (Syntex) 1992-94, 96
  - Pfizer 1993-95, 2002, 2003, 2004
  - Sepracor 1995
  - Parke Davis 1996
  - Cayman Chemical Co. 2003-present

## UNIVERSITY AND COLLEGE COMMITTEES

Year	Committee
77-80	College Advisory Council (Osteopathic Medicine)
79	Chairperson Selection Committee - Biochemistry
81-86	Pharmacology Training Grant (Pharmacology)
83	Student Performance Committee (Human Medicine)
83-84	Chairperson Search Committee - Biochemistry (Medical Schools), Chair
85-86	Chairperson Search Committee - Pharmacology (Medical Schools)

86-87	Admissions Committee (Osteopathic Medicine)
86-88	Promotions and Tenure Committee (Osteopathic Medicine)
89	Chairperson Search Committee - Biochemistry (Medical Schools)
87-90	Executive Committee - Cell and Molecular Biology Program
81-92	Executive Committee - Cardiovascular Training Grant
88-92	College Advisory Council (Osteopathic Medicine)
88-94	Graduate Director - Biotechnology Training Program
96	Search Committee - MAES Director
96-	Science Building Committee
97-98	Biomedical Implementation Committee
98-01	Search Committee—Hannah Chair in Plant Genomics
01	Search Committee—Surgery Chairperson, Coll. Human Medicine
02	Search Committee—Medicine Chairperson, Coll. Human Medicine
04	Search Committee—Pathology Chairperson, UM Medical School
04-05	Search Committee—Rackham Graduate Dean, UM
06-07	Search Committee—Department of Molecular & Integrative Physiology, UMMS
06-08	Chair, Endowment for the Basic Sciences (EBS)
03-present	Endowment for the Basic Sciences (EBS)
03-present	Search Committee—Biological Sciences Scholars Program, UMMS

#### **DEPARTMENTAL COMMITTEES**

75-77	Graduate Program Committee, Chair
77-78	Prelim Exam Committee
77	Cumulative Exam Committee
79-80,83	Faculty Recruitment Committees
79-80	Ad Hoc Curriculum Committee
90-91	Curriculum/Student Performance Committee, Chair
91-92	Preliminary Exam Committee
80-82,85-89,92-93	Graduate Admissions Committee, Chair
78-80,83-85,88-90,93-94	Faculty Advisory Committee, Chair
2003-present	Faculty Recruitment Committees
2003-present	Department of Biological Chemistry, UMMS, Faculty Advisory Committee, Chair

#### **HONORS AND AWARDS**

Phi Lambda Upsilon  
 NIH Postdoctoral Fellow, 1971-1973  
 AHA Established Investigator, 1981-1986  
 Faculty Teaching Award - Osteopathic Medicine, 1981  
 NIH MERIT Grant, 1987-95  
 MSU Research Excellence Award - Golden Key Society, 1989  
 Treadwell Award - George Washington University, 1991  
 Distinguished Faculty Award - Michigan State University, 1992  
 NIH MERIT Grant, 1995-2003

Abraham White Distinguished Scientific Achievement Award - Geo. Washington University, 1996  
Senior Aspirin Award, Bayer Corporation, 1997  
Michigan Association of Governing Boards Award, 1999  
University Distinguished Professor, Michigan State University, 2001-2003  
University Distinguished Professor Emeritus, Michigan State University, 2003-present  
AAAS Fellow (Medical Sciences), 2004  
ASBMB Avanti Award, 2004  
State of Michigan Scientist of the Year Award, 2004  
Berzelius Lectureship, Karolinska Institute, 2004  
William C. Rose Award, 2006  
Hayaishi Lectureship, Hamamatsu University, 2006  
Robert Olsen Lecturer, St. Louis University, 2007

#### **M.S. AND PH.D. THESIS DIRECTED AND POSTDOCTORAL FELLOWS**

R.L. Huslig, M.S. (1979) - Duke University, Dept. of Obstetrics  
T.E. Rollins, M.S. (1981) - Head of Chemistry, Sepracor  
F.C. Grenier, Ph.D. (1981) - Abbott Laboratories, Senior Scientist  
D.L. DeWitt, Ph.D. (1982) - Professor, Michigan State University  
A. Garcia-Perez, Ph.D. (1984) - NIH, Staff Fellow  
W.K. Sonnenburg, Ph.D. (1987) - University of Washington, Research Professor  
S.L. Ward, Ph.D. (1988) - American Red Cross  
P. Shi, Ph.D. (1993) - Massachusetts Gen. Hosp., Postdoctoral Fellow  
J.C. Otto, Ph.D. (1994) - Res. Assoc. Prof., Duke University  
M.K. Regier, Ph.D. (1995) - MSU/CHM  
L.C. Hsi, Ph.D., (1995) - Res. Asst. Prof., Baylor University  
A.C. Spencer, Ph.D. (1999) - Scientist, Protein Design Labs, Inc.  
J. Rieke, M.S. (1999) - Research Assistant, University of Michigan  
K.M. Lakkides, M.S. (1999) - Research Assistant, Michigan State University  
E. Thuresson, Ph.D. (2000) - NIH, Bethesda  
B. Wingerd, Ph.D., (2001) - Senior Scientist, Bioport  
C. Harmon, Ph.D., 2004, Postdoctoral Fellow, University of Maryland  
Y-J, Kang, Ph.D., 2005, Postdoctoral Fellow, Burnham Institute  
Y. Liu, Ph.D., 2006, Postdoctoral Fellow, University of Michigan  
U. Mboyne, Ph.D., current  
T. Yoshimoto, Postdoctoral (1981) - Tokushima University, Assoc. Professor  
Y. Tanaka, Postdoctoral (1982-1984) - NIH - Japan, Senior Scientist  
W.S. Spielman, Sabbatical Leave (1984) - Michigan State University, Professor  
K. Gerozissis, Postdoctoral (1984-1985) - University of Crete, Asst. Professor  
T. Watanabe, Postdoctoral (1983-1986) - University of Tokyo, Professor  
M. Inoue, Postdoctoral (1984-1986) - Nagoya City University, Professor  
K. Umegaki, Postdoctoral (1985-1986) - Nat. Inst. of Nutrition, Tokyo, Scientist  
J. Zhu, Visiting Scholar (1987-1988) - University of Nebraska  
E.A. El-Harith, Postdoctoral (1986-1988) - SUNY, Buffalo, Asst. Professor  
D.L. DeWitt, Postdoctoral (1985-1988) - Michigan State University, Professor

T. Nakao, Postdoctoral (1987-1989) - Tokyo University, Professor  
 R.A. Armstrong, Sabbatical Leave (1988-89), Professor, Albion College  
 T. Shimokawa, Postdoctoral (1989-91), Yamanouchi Pharmaceutical Co. Ltd.  
 E. Subers, Postdoctoral (1989-91)  
 G. Rimon, Sabbatical Leave (1989-1990), Ben-Gurion University, Assoc. Professor  
 O. Laneuville, Postdoctoral (1992-95), Assoc. Professor, University of Ottawa  
 M. Lecomte, Postdoctoral (1992-94), Senior Scientist, Groupe LIPHA, Lyon, France  
 D. Bhattacharya, Postdoctoral (1993-94), Postdoctoral Fellow, N. Illinois University  
 K. Matsumoto, Postdoctoral (1994-96), Tokyo Medical/Dental University  
 I. Song, Postdoctoral (1994-1996), Assoc. Prof., Seoul City University  
 T. Arakawa, Postdoctoral (1995-1998), Meikai University, Saitama, Japan  
 R. Abesinghe, Postdoctoral (1995-97), Wake Forest Medical School  
 W. Silvia, University of Kentucky, Sabbatical Leave (1993-94)  
 I. Morita, Tokyo Medical/Dental University, Sabbatical Leave (1994)  
 G. Rimon, Sabbatical Leave (2001-2001), Ben-Gurion University, Professor  
 M. Malkowski, Postdoctoral (1997-2001)  
 S. Fleischer-Berkovich, Postdoctoral (1999-2001), Ben-Gurion Univ.  
 D. Kuklev, Postdoctoral (2001-2005), Senior Scientist, Cayman Chemical Co.  
 S. Siebold, Postdoctoral (1995-2005)  
 C. DeLong, Postdoctoral (2001-2006)  
 M. Wada, Postdoctoral (2002-present)  
 C. Yuan, Postdoctoral (2003-present)  
 R. Sidhu, Postdoctoral (2005-present)  
 N. Sharma, Postdoctoral (2007-present)  
 G. Rimon, Sabbatical Leave (2007-2008), Ben-Gurion University, Professor

## BIBLIOGRAPHY

### Papers Published

- Smith, W.L., and W.E.M. Lands. The self-catalyzed destruction of lipoxidase. Biochem. Biophys. Res. Commun. **41**, 846 (1970).  
 Lands, W.E.M., R.E. Lee and W.L. Smith. Factors regulating the biosynthesis of various prostaglandins. Ann. N.Y. Acad. Sci. **180**, 107 (1971).  
 Barber, E.D., W.L. Smith and W.E.M. Lands. Incorporation of ricinoleic acid into glycerolipids. Biochim. Biophys. Acta **248**, 171 (1971).  
 Smith, W.L., and W.E.M. Lands. Stimulation and blockade of prostaglandin biosynthesis. J. Biol. Chem. **246**, 6700 (1971).  
 Smith, W.L. Oxygenation of polysaturated fatty acids by sheep vesicular gland and soybean dioxygenase. J. Biol. Chem. **247**, 1038 (1972).  
 Smith, W.L., and W.E.M. Lands. Oxygenation of polysaturated fatty acids during prostaglandin biosynthesis by sheep vesicular gland. Biochemistry **11**, 3276 (1972).  
 LeTellier, P.R., W.L. Smith and W.E.M. Lands. Effect of metal-complexing agents on the oxygenase activity of sheep vesicular glands. Prostaglandins **4**, 837 (1973).  
 Smith, W.L., and C.E. Ballou. The 6-O-methylglucose containing lipopolysaccharides of Mycobacterium phlei: locations of the neutral and acidic acyl groups. J. Biol. Chem.



- 248, 7118 (1973).
- Smith, W.L., and C.E. Ballou. Immunochemical characterization of the mannan component of the external invertase of *Saccharomyces cerevisiae*. *Biochemistry* **13**, 355 (1974).
- Smith, W.L., and C.W. Ballou. The effect of dithiothreitol on yeast external invertase. *Biochem. Biophys. Res. Commun.* **59**, 314 (1974).
- Smith, W.L., T. Nakajima and C.E. Ballou. Biosynthesis of yeast mannan: isolation of *Klyveromyces lactis* mannan mutants and a study of the incorporation of N-acetyl-D-glucosamine into the polysaccharide side-chains. *J. Biol. Chem.* **250**, 3426 (1975).
- Smith, W.L. Flurbiprofen-Sepharose chromatography of the prostaglandin synthetase from bovine seminal vesicles. *Prostaglandins* **10**, 983 (1975).
- Hemler, M., W.E.M. Lands and W.L. Smith. Purification of the cyclooxygenase that forms prostaglandins. Demonstration of two forms of iron in the holoenzyme. *J. Biol. Chem.* **251**, 5575 (1976).
- Smith, W.L., and G.P. Wilkin. Immunochemistry of prostaglandin endoperoxide forming cyclooxygenases: the detection of the cyclooxygenases in rat, rabbit and guinea pig kidneys by immunofluorescence. *Prostaglandins* **13**, 873 (1977).
- Stygles, V.G., W.L. Smith, D.A. Reinke and J.B. Hook. Prostaglandin-forming cyclooxygenase in renal medulla of spontaneously hypertensive rats during development. *Biol. Neonate* **33**, 309 (1978).
- Smith, W.L., and T.G. Bell. Immunohistochemical localization of the prostaglandin-forming cyclooxygenase in renal cortex. *Am. J. Physiol.* **235**, F451 (1978).
- Grenier, F.C., and W.L. Smith. Formation of 6-keto-PGF<sub>1 $\alpha$</sub>  by collecting tubule cells isolated from rabbit renal papillae. *Prostaglandins* **16**, 759 (1978).
- Smith, W.L., T.G. Bell and P. Needleman. Increased renal tubular synthesis of prostaglandins in the rabbit kidney in response to urethral obstruction. *Prostaglandins* **18**, 269 (1979).
- Huslig, R.L., R.L. Fogwell and W.L. Smith. The prostaglandin-forming cyclooxygenase of ovine uterus: relationship to luteal function. *Biol. Reprod.* **21**, 589 (1979).
- Smith, W.L., D.I. Gutekunst and R.H. Lyons, Jr. Immunocytochemical localization of the prostaglandin-forming cyclooxygenase in the cerebellar cortex. *Prostaglandins* **19**, 61 (1980).
- Rollins, T.E., and W.L. Smith. Subcellular localization of the prostaglandin-forming cyclooxygenase in swiss mouse 3T3 cells by electron microscopic immunocytochemistry. *J. Biol. Chem.* **255**, 4872, (1980).
- Smith, W.L. Renal prostaglandin biochemistry. *Mineral Electrolyte Metab.* **6**, 10 (1981).
- Noden, P.A., W.L. Smith, D.L. DeWitt and J.F. Roux. Prostaglandin-forming cyclooxygenase activity in rabbit amnion, yolk sac splanchnopleure, placenta, decidua and uterus at 20 to 30 days gestation. *Biol. Reprod.* **24**, 1042-1047 (1981).
- Grenier, F.C., T.E. Rollins and W.L. Smith. Kinin-induced prostaglandin synthesis by renal papillary collecting tubule cells. *Am. J. Physiol.* **241**, F94 (1981).
- DeWitt, D.L., T.E. Rollins, J.S. Day, J. A. Gauger and W.L. Smith. Orientation of the active site and antigenic determinants of prostaglandin endoperoxide (PGH) synthase in the endoplasmic reticulum. *J. Biol. Chem.* **256**, 10375 (1981).
- Grenier, F.C., M.L. Allen and W.L. Smith. Interrelationships among prostaglandins, vasopressin and cAMP in renal papillary collecting tubule cells. *Prostaglandins* **23**, 546-565 (1982).
- Garcia-Perez, A., and W.L. Smith. Isolation of canine cortical collecting tubule cells using monoclonal antibodies: AVP-induced prostaglandin synthesis. *Am. J. Physiol.* **244**, C211-C220 (1983).

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- Pagels, W.R., L.J. Marnett, D.L. DeWitt and W.L. Smith. Immunochemical evidence for the involvement of prostaglandin endoperoxide synthase in hydroperoxide-dependent oxidations by ram seminal vesicles. *J. Biol. Chem.* **258**, 6517 (1983).
- Smith, W.L., D.L. DeWitt, and M.L. Allen. Bimodal distribution of the PGI<sub>2</sub> synthase antigen in smooth muscle cells. *J. Biol. Chem.* **258**, 4922 (1983).
- Benigni, A., P. Dodesini, G. Remuzzi, A. Schieppatti, G. DeGaetano, J.S. Day, W.L. Smith, E. Pinca, P. Patrignani, and C. Patrono. Reduced platelet thromboxane formation in uremia. Evidence for a functional cyclooxygenase defect. *J. Clin. Invest.* **71**, 762 (1983).
- DeWitt, D.L., J.S. Day, W.K. Sonnenburg and W.L. Smith. Concentrations of PGH synthase and PGI<sub>2</sub> synthase in the endothelium and smooth muscle of bovine aorta. *J. Clin. Invest.* **72**, 1882 (1983).
- Garcia-Perez, A., and W.L. Smith. Apical-basolateral membrane asymmetry in canine cortical collecting tubule cells: bradykinin, AVP, PGE<sub>2</sub> interrelationships. *J. Clin. Invest.* **74**, 63-74 (1984).
- Smith, W.L., and A. Garcia-Perez. Immunodissection: Use of monoclonal anti-bodies to isolate specific types of renal cells. *Am. J. Physiol.* **248**, F1 (1985).
- Spielman, W.S., W.K. Sonnenburg, M.L. Allen, K. Gerozissis and W.L. Smith. Immunodissection and culture of rabbit cortical collecting tubule cells. *Am. J. Physiol.* **251**, F348-357 (1986).
- Watanabe, T., K. Umegaki and W.L. Smith. Association of a prostaglandin E<sub>2</sub> binding protein with a pertussis toxin-reactive guanine nucleotide regulatory protein. *J. Biol. Chem.* **261**, 13430-13439 (1986).
- Tanaka, Y., S.L. Ward and W.L. Smith. Immunochemical and kinetic evidence for two different PGH-PGE isomerases in sheep vesicular gland microsomes. *J. Biol. Chem.* **262**, 1374-1381 (1987).
- Arend, L.J., W.K. Sonnenburg, W.L. Smith and W.S. Spielman. A1 and A2 adenosine receptors in rabbit cortical collecting tubule cells: modulation of hormone-stimulated cAMP. *J. Clin. Invest.* **79**, 710-714 (1987).
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- Smith, W.L., and D.L. DeWitt. Cyclooxygenase Inhibitors. (2001) In *Therapeutic Immunology*, (K.F. Austen, S.J. Burakoff, F.S. Rosen, and T.B. Strom, eds.), Blackwell Scientific Publications, Inc., pp. 117-131.
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- Smith, W.L. and R.C. Murphy. Prostaglandins and Leukotrienes. In: *Encyclopedia of Biological Chemistry* (W. Lennarz and M.D. Lane, eds.), Elsevier, Amsterdam, 2004.
- Smith, W.L. Omega-6 Fatty Acids. In: *Encyclopedia of Dietary Supplements* (M. Levine, ed.), Marcel Dekker, New York, 2005.
- Kang, Y-J., U.R. Mbonye, C.J. DeLong, M. Wada and W.L. Smith. Regulation of intracellular cyclooxygenase levels. *Prog. Lipid Res.*, 46:108-125, 2007
- Smith, W.L. and R.C. Murphy. The eicosanoids: cyclooxygenase, lipoxygenase, and epoxygenase pathways. In: *Biochemistry of Lipids, Lipoproteins and Membranes* (D.E. Vance and J.E. Vance, Eds.), Elsevier, Amsterdam, 2008.
- Smith, W. L. Nutritionally essential fatty acids and biologically indispensable cyclooxygenases. *TIBS*, 33:7-37, 2008

Smith, W. L. and R.C. Murphy. Oxidized lipids formed non-enzymatically by reactive oxygen species. *J. Biol. Chem.*, 283: 15513-15514, 2008

### **Patents**

Smith, W.L., and D.L. DeWitt. Method for the detection of an antigen using at least two different monoclonal antibodies. No. 4,471,058; September 11, 1984.

### **INVITED PRESENTATIONS**

- 1976-1980 Department of Chemistry, Hope College, November 19, 1976.  
Colorado Association for Continuing Medical Laboratory Education, Denver, CO, April 4-5, 1978.  
The Physiological Society of Philadelphia and the Jefferson Medical College of Thomas Jefferson University at the 20th Annual A.N. Richards Symposium on Prostaglandins in Cardiovascular and Renal Function, Philadelphia, PA, May 8-9, 1978.  
Department of Chemistry, Wayne State University, November 10, 1978.  
Department of Pharmacology, Michigan State University, January 8, 1980.  
Departments of Biochemistry and Medicine, VA Hospital, St. Louis University, St. Louis, MO, January 16, 1980.  
57th Annual Veterinary Conference, Michigan State Univ., January 21, 1980.  
Department of Biochemistry, University of Miami, April 25, 1980.  
Golden Jubilee International Congress on Essential Fatty Acids and Prostaglandins, Minneapolis, MN, May 5, 1980.  
Department of Pharmacology, McNeil Laboratories, Fort Washington, PA, July 17, 1980.  
UpJohn Company, Kalamazoo, MI, December 11, 1980.
- 1981 1981 Prostaglandin Conference, Clearwater, FL, March 1, 1981.  
Winter Prostaglandin Conference, Clearwater, Florida, March 3, 1981.  
Departments of Medicine and Pathology, Michigan State University, March 12, 1981.  
International Symposium on Arachidonic Acid Metabolites and the Kidney, June 4, 1981, Rome, Italy.  
Department of Biochemistry, Michigan State University, November 9, 1981.  
Departments of Physiology and Biochemistry, West Virginia University, Morgantown, WV, November 17, 1981.
- 1982 Departments of Biochemistry and Pathology, University of Illinois, Chicago, IL, March 30, 1982.  
International Conference on Prostaglandins, Florence, Italy, May 19, 1982.  
Department of Pharmacology, Washington University School of Medicine, St. Louis, MO, October 7, 1982.  
NIH Gerontology Research Center, Baltimore, MD, October 18, 1982.  
Seragen, Boston, MA, November 8, 1982.
- 1983 Winter Prostaglandin Conference, Keystone, Colorado, January 4, 1983.  
Dept. of Animal Science, Michigan State University, East Lansing, MI, April 23, 1983.  
Pfizer Central Research Laboratories, Groton, CT, April 25, 1983.  
Department of Medicine, Ford Hospital, Detroit, MI, June 15, 1983.  
American Society of Nephrology Symposium, Washington, D.C., December 5, 1983.

- 1984 Winter Prostaglandin Conference, Keystone, CO, March 24, 1984.  
Department of Biochemistry, University of California, Berkeley, April 30, 1984.  
American Society of Pediatric Nephrology, San Francisco, CA, May 1, 1984.  
IV International Washington Spring Symposium: Prostaglandins and Leukotrienes, Washington, D.C., May 9, 1984.  
ACS Symposium, Kalamazoo, MI, May 24, 1984.  
Kyoto Conference on Prostaglandins, Kyoto, Japan, November 27, 1984.  
Chairman, Session on Mechanisms of Eicosanoid Action, Kyoto Conference on Prostaglandins, Kyoto, Japan, November 27, 1984.
- 1985 Organizer, Session on Receptor and Postreceptor Mechanisms, 1985 Winter Prostaglandin Conference, Keystone, CO, January 11, 1985.  
Department of Physiology, University of Texas Health Science Center, Houston, TX, April 9, 1985.  
NIH Conference on Tissue/Cell Culture in Renal Research, Bethesda, MD, September 8, 1985.  
Department of Medicine, Case Western Reserve University, Cleveland, OH, October 8, 1985.  
Department of Internal Medicine, University of Michigan, Ann Arbor, MI, October 24, 1985.
- 1986 Gordon Research Conference - Kallekreins and Kinins, Oxnard, CA, February 19, 1986.  
Pfizer Traveling Fellow of the Montreal Institute for Medical Research, Montreal, Quebec, April 14, 1986.  
Sixth International Congress on Prostaglandins and Related Compounds, Florence, Italy, June 4, 1986.  
Merck, Sharp and Dohme Workshop on Bone Biology, Branchburg, NJ, June 28, 1986.  
Department of Pharmacology, University of Texas Health Science Center, Dallas, TX, December 18, 1986.
- 1987 Department of Chemistry, Wayne State University, Detroit, MI, March 6, 1987.  
1987 Winter Prostaglandin Conference, Orlando, FL, March 12, 1987.  
Department of Physiology and Biophysics, Case Western Reserve University, Cleveland, OH, May 1, 1987.  
International Conference on Renal Eicosanoids, Capri, Italy, June 8, 1987.  
Department of Physiology, University of Wisconsin, Madison, WI, June 22, 1987.  
Gordon Research Conference - Lipid Metabolism, Kimball Union Academy, NH, June 30, 1987.  
Department of Chemistry, Calvin College, Grand Rapids, MI, October 1, 1987.  
Department of Chemistry, Hope College, Holland, MI, October 2, 1987.  
Department of Pharmacology, University of Tennessee HSC, Memphis, TN, October 7, 1987.  
Department of Biochemistry, University of North Dakota, October 12, 1987.  
Department of Biology, Notre Dame University, Notre Dame, IN, November 10, 1987.  
Department of Physiology and Biophysics, Mayo Foundation, Rochester, MN, November 16, 1987.  
Department of Chemistry, St. Olaf College, Northfield, MN, November 17, 1987.

- 1988 Winter Prostaglandin Conference, Keystone, CO, January 8, 1988.  
Taipei Conference on Prostaglandin and Leukotriene Research, Taipei, Taiwan, April 23, 1988.  
Departments of Pharmacology/Medicine, University of Texas, Houston, TX, May 12, 1988.  
Department of Chemistry, Harvard University, Boston, MA, May 23, 1988.  
2nd International Symposium on Platelets and Vascular Occlusion, Rome, Italy, June 2, 1988.  
Hypertension Research Division, Henry Ford Hospital, Detroit, MI, October 14, 1988.  
Department of Biochemistry, University of West Virginia, October 24, 1988.  
American Society of Nephrology Meeting, San Antonio, TX, December 10, 1988.
- 1989 Winter Prostaglandin Conference, Keystone, CO, January 18, 1989.  
Department of Biochemistry, Colorado State University, Ft. Collins, CO, February 24, 1989.  
FASEB Symposium, New Orleans, LA, March 23, 1989.  
Department of Pharmacology, New York Medical College, Valhalla, NY, April 28, 1989.  
Aspirin Symposium, British Heart Association, London, England, May 31, 1989.  
Eicosanoid Symposium, Interlaaken, Switzerland, September 13, 1989.  
Department of Molecular Biology, University of Wyoming, October 6, 1989.  
Japanese Biochemical Society, Kyoto, Japan, November 6, 1989.
- 1990 Department of Biochemistry, University of Illinois, Chicago, March 12, 1990.  
Department of Biochemistry, University of Nevada, Reno, March 14, 1990.  
International Workshop on Bone Biology, Davos, Switzerland, April 9, 1990.  
International Prostaglandin Conference, Florence, Italy, May 29, 1990.  
Drug Treatment of Stroke and Ischemic Brain, Scheveningen, The Netherlands, June 29, 1990.  
Allergan, Irvine, CA, November 9, 1990.  
Departments of Biochemistry and Medicine, Vanderbilt University, December 6-7, 1990.
- 1991 Department of Physiology, University of Michigan, January 9, 1991.  
George Washington University International Spring Symposium, May 14, 1991.  
DuPont Merck, Wilmington, Delaware, August 19, 1991.  
Eicosanoids in Cancer, Inflammation and Radiation Injury, Berlin, September 19, 1991.
- 1992 Department of Biochemistry, Bowman Gray School of Medicine, March 20, 1992.  
Department of Pharmacology, New York Medical College, March 21, 1992.  
Division of Biological Sciences, Allergan, Irvine, CA, March 23, 1992.  
European Thrombosis Research Organization, S. Maria Imbaro, Italy, April 4, 1992.  
IUBMB Conference, Nagoya, Japan, June 2, 1992.  
International Prostaglandin Conference, Montreal, July 27, 1992.  
Department of Cell Biology, Upjohn Company, August 26, 1992.  
Department of Medicine, University of Texas HSC, Houston, TX, September 4, 1992.

- Department of Physiology, Case Western Reserve, September 21, 1992.  
 Dunaway-Burcham Lecturer, Dartmouth Medical School, September 25, 1992.  
 Miles Pharmaceuticals, New Haven, CN, September 28, 1992.  
 Pfizer Central Research, Groton, CN, September 29, 1992.  
 Department of Pharmacology, Medical College of South Carolina, November 9, 1992.  
 Department of Pharmacology, University of Wisconsin, November 19, 1992.
- 1993 Winter Prostaglandin Conference, Keystone, CO, January 18, 1993.  
 Department of Biochemistry, Syntex, January 22, 1993.  
 Frontiers in Biomedical Research, Palm Springs, CA, February 18, 1993.  
 Department of Chemistry, Oakland University, March 17, 1993.  
 Association for Research in Vision and Ophthalmology, Sarasota, FL, May 7, 1993.  
 Canadian Society of Chemistry, Sherbrooke, Quebec, May 31, 1993.  
 Merck-Frosst, Montreal, Canada, June 1, 1993.  
 Platelets and Vascular Occlusion, New York Academy of Science, Santa Fe, NM, June 8, 1993.  
 Third Int. Conf. Eicosanoids and Cancer, Georgetown, October 13, 1993.  
 Advances in Eicosanoid Research, New York Academy of Science, Stockholm, November 15, 1993.  
 University College, Dublin, November 18, 1993.  
 International Conference on the Molecular Biology of the Arachidonate Cascade, Kyoto, Japan, December 7, 1993.
- 1994 Pulmonary and Gastrointestinal Inflammation: New Frontiers, UC San Diego, January 15, 1994.  
 Departments of Pediatrics and Pulmonary Medicine, Nat. Jewish Hospital, Denver, January 21, 1994.  
 ACS Workshop: NSAIDs and Cancer, Atlanta, March 21, 1994.  
 FASEB Symposium: Lipid Mediators and Inflammation, Anaheim, April 26, 1994.  
 Department of Pharmacology, Medical College of Wisconsin, Milwaukee, May 17, 1994.  
 9th International Symposium on Prostaglandins and Related Compounds, Florence, Italy, June 6, 1994.  
 International Congress of Pharmacology, Montreal, Canada, July 26, 1994.  
 XIIIth International Symposium of Medicinal Chemistry, Paris, September 22, 1994.  
 Department of Pharmacology, Washington University, St. Louis, November 11, 1994.  
 Department of Chemistry, Calvin College, Grand Rapids, MI, December 1, 1994.
- 1995 Department of Chemistry, Hope College, Holland, MI, December 2, 1994.  
 Graduate Departments of Biochemistry, Kauai, Hawaii, January 14, 1995.  
 FASEB Meeting Symposium, Atlanta, April 20, 1995.  
 Lipid Metabolism Gordon Conference, Meriden, NH, June 26, 1995  
 International Congress of Nephrology, Madrid, Spain, July 5, 1995.  
 Cytokine FASEB Summer Symposium, Saxton's River, VT, July 9, 1995.  
 4th International Conference on Eicosanoids and Other Bioactive Lipids in Cancer, Inflammation and Radiation Injury, Hong Kong, October 4, 1995.  
 Department of Medicine/Experimental Therapeutics, U Penn, November 2, 1995

- Sepacor, Boston, MA, November 3, 1995
- 1996 Bayer Aspirin Award Symposium, Seville, Spain, December 1, 1995  
 Roche Biosciences, Palo Alto, CA, March 14, 1996  
 EuroConference, Paris, April 17, 1996  
 Department of Biological Chemistry, Univ. of Michigan, April 30, 1996  
 George Washington University XVIth Spring Symposium, May 7, 1996  
 Parke Davis, Ann Arbor, Michigan, May 17, 1996  
 ASBMB Symposium, New Orleans, June 3, 1996  
 Wayne State University, October 29, 1996
- 1997 Keystone Symposium on Lipid Mediators, January 26, 1997  
 Gordon Conference on Quinones and Redoxactive Amino Acids, Pisa, May 7, 1997  
 International Conference on Hemostasis and Thrombosis, Florence, June 12, 1997  
 Gordon Conference on Lipids and Lipid Mediators, Meriden, NH, June 22-27, 1997  
 International Conference on Essential Fatty Acids/Eicosanoids, Edinburgh, July 21, 1997  
 ASBMB/International Congress of Biochemistry, San Francisco, August 25, 1997  
 1st International Conference on COX-2, New Orleans, September 13, 1997  
 Inflammation and Radiation Injury, September 18, 1997  
 Aspirin Awards Symposium, New York, November 8, 1997
- 1998 COE Symposium, National Cardiovascular Research Center, Osaka, Japan, March 16, 1998  
 Clinical Roundtable Meeting on Preferential Cyclooxygenase Inhibitors, Frankfurt, Germany, April 18, 1998
- 1999 2nd International Conference on COX-2, Maui, Hawaii, July 29, 1998  
 Winter Eicosanoid Meeting, Baltimore, March 8, 1999  
 Keystone Symposium on Lipid Mediators, Keystone, CO, April 3, 1999  
 Schering Foundation Symposium on Eicosanoids, San Francisco, June 28, 1999  
 3rd International Conference on COX-2, Kona, Hawaii, August 31, 1999  
 Eicosanoids and Other Bioactive Lipids in Cancer, Boston, September 13, 1999
- 2000 Winter Eicosanoid Meeting, Baltimore, March 14, 2000, Baltimore, MD  
 NIH Workshop on Essential Fats in Foods, Washington, D.C., March 20, 2000  
 11<sup>th</sup> Int. Conf. On Advances in Prost.and Leuk.Res., Florence, Italy, June 6, 2000  
 3<sup>rd</sup> Int. Conf. On Oxygenases, Kyoto, Japan, November 28, 2000  
 Department of Biochem., Tokyo Med. And Dent. Univ., November 30, 2000  
 Depart. of Pharmacol., Kanazawa University, Kanazawa, Japan, Dec. 1, 2000
- 2001 Keystone Conference, Snowbird, Utah, April 8, 2001  
 Albany Medical College, Ctr. for Cardiovascular Sciences, Albany, NY, May 9, 2001  
 University of Washington, Seattle, Dept. of Chemistry, May 25, 2001  
 National Jewish Research Center, Denver, CO, May 30, 2001  
 Lipid Gordon Conference, Kimball Union Acad., Meriden, NH, July 17, 2001  
 Department of Biotechnology, Fukuyama Univ., Fukuyama, Japan, September 22, 2001  
 7<sup>th</sup> International Conference on PAF and Related Lipids, Tokyo, September

- 26, 2001  
College of Pharmacy, Nagoya City University, Nagoya, Japan, September 28, 2001  
Eicosanoids and Other Bioactive Lipids in Cancer, Nashville, October 14, 2001  
NJMDU/Rutgers, Department of Pharmacology, November 15, 2001.  
McMasters Univ., Biochemistry Dept., Hamilton, Ont., December 6, 2001
- 2002  
University of Michigan, Department of Biological Chemistry, March 12, 2002  
University of Missouri, Department of Biochemistry, April 25, 2002  
Karolinska Institute Symposium on Eicosanoids, Stockholm, October 21, 2002  
Pfizer Pharmaceuticals, Groton, CT, November 14, 2002  
5<sup>th</sup> Annual Workshop on COX-2, Rome, December 14, 2002
- 2003  
Keystone Eicosanoid Meeting, Lake Tahoe, CA, March 10, 2003  
Medical Coll. So. Carolina, Charleston, March 20, 2003  
International Congress on Eicosanoids and Cancer, Chicago, September 9,  
Duke University, Department of Biochemistry, December 10, 2003  
8<sup>th</sup> International Meeting on Eicosanoids and Cancer, September 8, 2003  
UM Presentations in Pharmacology, Toxicology, Nephrology, Dean's Lectures
- 2004  
Riken Structural Biophysics Symposium, Harima, Japan, January 22,  
ASBMB Avanti Award Lecture, Boston, MA, June 12, 2004  
Wayne State University, Detroit, MI, October 8, 2004  
Berzelius Lecture, Karolinska Institute, Stockholm, November 9, 2004  
Department of Pharmacology, Texas A&M, College Station, November 14  
Pfizer, Ann Arbor, December 7, 2004
- 2005  
Tokyo Medical and Dental University, Tokyo, Japan, March 28, 2005  
Pharmaceutical Society of Japan, Tokyo, Japan, March 31, 2005  
Keystone Symposium on Bioactive Lipids, Lipidomics and their Targets, Whistler, BC, April 12, 2005  
Stowers Institute, Invited Seminar Speaker, May 4, 2005  
Gordon Research Conference on the Molecular & Cellular Biology of Lipids, Meriden, NH, July 26, 2005  
University of Iowa, Invited Seminar Speaker, November 17, 2005
- 2006  
Keystone Symposium on Eicosanoids in Inflammation and Chronic Diseases, Park City, Utah, January 11, 2006  
Winter Eicosanoid Conference Symposium, March 13, 2006  
ASBMB William C. Rose Award Lecture, April 3, 2006  
Tokyo Medical and Dental University, Tokyo, Japan, April 6, 2005  
Takeda Symposium on BioScience, Kyoto, Japan, April 11, 2006  
University of Minnesota, Department of Biochemistry, Molecular Biology and Biophysics, Minneapolis, April 26, 2006  
ASCO Annual Meeting, Atlanta June 4, 2006  
12<sup>th</sup> Osamu Hayaishi Lecture, Hamamatsu, Japan, December 4, 2006  
Kyoto University, December 6, 2006
- 2007  
Neogen Corporation, March 1, 2007  
24<sup>th</sup> Robert Olsen Lecture, St. Louis University, March 28, 2007  
Wake Forest University, April 24, 2007  
Johns Hopkins University, September 12, 2007  
10<sup>th</sup> International Conference on Eicosanoids, Montreal, September 18, 2007  
Weizman Institute, Rehovot, Israel, October 11, 2007



2008 International Cancer Conf. Cancer Prevention, Haifa, Israel, October 13, 2007  
Carter Symposium, Tucson, AZ, October 27, 2007  
Queen's University, Kingston, Ontario, Canada, November 14, 2007  
Eicosanoid Keystone Symposium, Big Sky, Montana, January 8, 2008  
University of Illinois, Chicago, May 16, 2008  
ISSFAL Meeting, Kansas City, May 18, 2008  
Department of Pharmacology, Univ. of Colorado, July 17, 2008  
NIAAA, Bethesda, September 25, 2008  
Hope College, November 14, 2008