

**PART I: General Information**

**DATE PREPARED:** January 17, 2006

**Name:** **Garland R. Marshall, Ph.D.**

**Title:** Professor

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**Place of Birth:** San Angelo, Texas

**Education**

1966 - Ph.D., The Rockefeller University – Thesis advisor – R. Bruce Merrifield

1962 - B.S., California Institute of Technology

**Postdoctoral Training**

none

**Licensure and Certification**

none

**University Regulatory Requirements**

Conflict of Interest (COI)/Financial Disclosure (*Expiration: December, 2006*)

Human Subjects Approvals (*protocol #'s and expiration dates*): None

Animal Protocol Approvals (*protocol #'s and expiration dates*): None

Radioactive Material Approvals: (*expiration date*) - None

Stem Cell Research Approvals: - None

Recombinant DNA Approvals: (*expiration date*): - None

Do you store, have access to, or use Protected Health Information (PHI)? - No

**Academic Appointments**

1966-present Professor, Biochemistry and Molecular Biophysics

2000-present Professor, Biomedical Engineering

2000-present Member, Center for Computational Biology

2002-present Member, Alvin J. Siteman Cancer Center

1988-2000 Director, Center for Molecular Design, Institute for Biomedical Computing,  
Washington University, St. Louis, Missouri

1988-2000 Professor, Computing, Washington University School of Medicine, St. Louis,  
Missouri

1985-2000	Professor, Molecular Biology and Pharmacology, Washington University School of Medicine, St. Louis, Missouri
1989-1990	Adjunct Professor, School of Science and Technology, Bond University, Queensland, Australia
1976-1986	Professor of Physiology and Biophysics, Washington University School of Medicine, St. Louis, Missouri
1972-1976	Associate Professor, Department of Physiology and Biophysics and of Biological Chemistry, Washington University School of Medicine, St. Louis, Missouri
1968-1985 Louis, Missouri	Research Associate, Computer Systems Laboratory, Washington University, St. Louis, Missouri
1967-1972	Assistant Professor, Departments of Physiology and Biophysics and of Biological Chemistry, Washington University, Missouri
1966-1967	Instructor, Departments of Physiology and Biophysics and of Biological Chemistry, Washington University School of Medicine, St. Louis, Missouri
1966	Guest Investigator, Dyson Perrins Laboratory, Oxford University, England

### **Major Administrative Responsibilities**

2000-present	Senior Member, Center for Computational Biology
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### **Major Committee Assignments**

#### Medical School

2000-present	Member, Steering Committee, Computational Biology Program
1991-2001	Member, Steering Committees, Bioorganic and Molecular Biophysics Programs
1980-1986	Member, Steering Committee, Cellular and Integrative Biology Program
1973-1980	Member, Steering Committee, Molecular Biology Program
1972-1973	Member, Medical Admissions Committee
1971-1973	Director, Graduate Program, Dept. of Physiology and Biophysics
1970-1994	Member, Biomedical Research Support Grant Advisory Committee
1970-1994	Member, Clinical Research Center Advisory Committee

#### University

2003-present	Member, Review Committee, Bear Cub Applications
1988-1992	Member, Computer Network Advisory Committee

#### National

2005-present	Member, Board of Trustees, Torrey Pines Institute of Molecular Sciences, La Jolla, CA
2005-present	Member, Board of Trustees, Alzheimer's and Aging Research Center, La Jolla, CA
2005-present	Member, Scientific Advisory Board, Center for Drug Design, University of Minnesota
2003-present	Member, Scientific Advisory Board, University of Illinois Chicago, Anthrax therapeutics
2000	Co-Chairman, 2000 Gordon Research Conference on Chemistry and Biology of Peptides, Ventura, CA

1987-1994	Member, George Hitchings Award Advisory Committee, The Burroughs Wellcome Fund
1990-1993	Councilor, American Peptide Society
1986-1988	President and Chairman, Tenth American Peptide Symposium
1981-1990	Member, Planning Committee, American Peptide Symposium

#### International

2001-present	Member, Scientific Advisory Board, Institute for Molecular Biosciences, University of Queensland, Brisbane, Australia
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#### **Professional Societies**

1966-present	American Chemical Society
1966-present	Biophysical Society
1966-present	American Association for the Advancement of Science
1966-present	American Society for Pharmacology and Experimental Therapeutics
1966-present	American Society for Biochemistry and Molecular Biology
1966-present	American Peptide Society
1966-present	The Protein Society

#### **Community Service Related to Professional Work**

2003-present	Fellow, St. Louis Academy of Science
2004-present	Member, Albert Einstein Society
2004-present	Member, James Eads Society

#### **Editorial Boards**

2005-present	Member, Editorial Advisory Board, <i>Chemical Biology &amp; Drug Design</i>
1997-present	Member, Editorial Board - <i>Biopolymers (Peptide Science)</i>
1989-1996	Member, Editorial Board, <i>International Journal of Peptide and Protein Research</i>
1986-1989	Member, Editorial Board for the Journal, " <i>Drug Design and Delivery</i> "
1986-1997	Founder, Editor-in-Chief, <i>Journal of Computer-Aided Molecular Design</i>
1990-1997	Expert Analyst, <i>CHEMTRACTS: Biochemistry and Molecular Biology</i>

#### **Consulting**

##### Previous

1967-1968	Monsanto Company, St. Louis, Missouri
1989-1990	Monsanto Company, St. Louis, Missouri
1996-2000	Monsanto Company, St. Louis, Missouri
1967-1970	Eli Lilly and Co., Indianapolis, Indiana
1975-1978	Wellcome Research Laboratories, Beckenham, Kent, England
1980-1989	Smith, Kline and French Laboratories, Philadelphia, Pennsylvania
1987-1992	Warner-Lambert/Parke-Davis, Ann Arbor, Michigan
1990-1991	Farmitalia Carlo Erba, Milan, Italy
1991, 1996	Sandoz Pharmaceutical Co.
1993-1996	Dupont-Merck Pharmaceuticals, Wilmington, Delaware

##### NIH Review Panels (significant/recent)

2006	<i>ad hoc</i> reviewer, NIH, DRG, Drug Discovery and Molecular Pharmacology Study Section
2004-2005	NIH Member/Co-chair, Roadmap Study Section – Centers for Computational Biology

- 2004 *ad hoc* reviewer, National Institutes of Health, Bioorganic and Natural Products Study Section
- 1993-1996 National Institutes of Health, Bioorganic and Natural Products Study Section
- 1976-1982 National Institute of Child Health and Human Development, Office of Grants and Contracts
- Current**
- 2002-present Member, Scientific Advisory Board, MDS Capital/Canadian Medical Discoveries Fund Inc. Toronto, Canada, venture capital

#### Awards and Honors

- 2006 16<sup>th</sup> Smissman Memorial Lecturer, Department of Medicinal Chemistry, University of Kansas, Lawrence, KS
- 2003 Excellence in Life Sciences Entrepreneurship – Serial, Missouri Biotechnology Association
- 2003 Fellow, St. Louis Academy of Sciences
- 2001 Merrifield Award, American Peptide Society, San Diego, CA, June, 2001
- 2000 Taito M. Soine Memorial Award, Department of Medicinal Chemistry, University of Minnesota
- 2000 Cathay Award, Chinese Peptide Society, Mt. Huangshan, China
- 2000 Co-chairman, Gordon Research Conference on Chemistry and Biology of Peptides, Ventura, CA
- 1997 Medal 50-Lecia Politechniki Lodzkiej (50th Anniversary of Technical University, Lodz, Poland)
- 1996 George B. Koelle Award, Mid-Atlantic Pharmacology Society
- 1996 Science and Technology Award, St. Louis Regional Commerce and Growth Association
- 1996 Midwest Award, St. Louis Regional Division, American Chemical Society
- 1994 Vincent duVigneaud Award, Gordon Conference on Peptides, Ventura, CA, Feb. 17, 1994
- 1993 Doctora Honoris Causa, Politechniki Lodzkiej, Oct. 1, 1993 (Technical University, Lodz, Poland)
- 1988 Medicinal Chemistry Award, Medicinal Chemistry Division, American Chemical Society
- 1987 Medal XL-Lecia Politechniki Lodzkiej (40th Anniversary of Technical University, Lodz, Poland)
- 1970-1975 Established Investigator, American Heart Association

#### VISITING PROFESSORSHIPS

- 2005 *Jan 9-14* Inaugural Lee Wing Nam Visiting Professor, School of Biological Sciences, Nanyang Technological University, Singapore
- 2003 *May-June* Fourth European Workshop on Drug Design, Certosa di Pontignano (Siena), Italy
- 2000 *Jan-Feb* Computational Medicinal Chemistry, Swedish Pharmaceutical Society, Åre, Sweden
- 1998 *May17-24* Second European Workshop on Drug Design, Certosa di Pontignano (Siena), Italy
- 1997 *August* Universidad Complutense, Cursos de Verano, El Escorial, Spain
- 1992 *May* Dipartimento di Chimica Farmaceutica e Tossicologica, Università di Napoli "Federico II", Naples, Italy
- 1992 *May* Dipartimento Farmaco Chemico Tecnologico, Università di Siena, Siena, Italy
- 1992 *April* Watson Visiting Professor, Department of Chemistry, Wichita State University, Wichita, Kansas
- 1991 *May* Dipartimento di Chimica Organica "Ugo Schiff", Università di Firenze, Florence, Italy
- 1989 *Sept* Pew Visiting Professor, Department of Chemistry, Grinnell College, Grinnell, Iowa
- 1975 Department of Chemistry, Biochemistry and Biophysics, Massey University, Palmerston North, New Zealand

## EXTERNAL EXAMINER, Ph.D. Theses

2003	Stephen Long, Ph.D., University of Queensland, Brisbane, Australia. "Combinatorial Methods in Drug Design: Towards Modulating Protein-Protein Interactions".
2002	Wesley Schall, Ph. D., Universitet Uppsala, Uppsala, Sweden. "Computational Studies of HIV-1 Protease Inhibitors".
1998	Anders Berglund, Ph.D., Universitet Umea, Umea, Sweden. "Some Extensions of PCA and PLS".

## Part II: Research, Teaching, and Clinical Contributions

### A1. Brief Narrative of Research Contributions (a few sentences)

### A2. Narrative Report of Research and Teaching Contributions (1 page or less)

## B. Research Funding

### B1a. Current Funding

### B1b. Pending

### B2. Completed Funding

## C. Report of Teaching

### 1. Local contributions

#### a. Medical school teaching

1967-1986 Endocrine section of first-year Physiology course (10 lectures, labs)

1987-2000 Analgesics and special topics section of second-year Pharmacology course (8 lectures)

#### b. Graduate school teaching (current) – 12 lectures, 3 labs

BME 462/5620. *Protein Function and Interactions*. David Sept, Coursemaster – teach protein engineering section (2 lectures)

BIO 5476. Modeling Biomolecular Systems I, Jay Ponder, Coursemaster – teach CADD, QSAR and experimental design (7 lectures, 3 labs)

*Lucille P. Markey Special Emphasis Pathway in Human Pathobiology*. Lee Ratner, Coursemaster – guest lecture "Therapeutic Approaches to AIDS"

BIO 5325. *Proteins*. Jay Ponder, Coursemaster – guest lecture on GPCR/G-protein interface

BME 140. *Introduction to Biomedical Engineering* (undergraduate). Frank Yin, Coursemaster – guest lecture on Computational Biology

#### c. Advisory responsibilities

d. Teaching leadership

e. Current advisees

<i>since 2002</i>	Sage Berg-Cross	predoctoral fellow
<i>since 2004</i>	J. W. Feng	predoctoral fellow
<i>since 2004</i>	Daniel Kuster	predoctoral fellow
<i>since 2004</i>	Robert Yang	predoctoral fellow
<i>since 2004</i>	Xiaoming Zhang	predoctoral fellow
<i>since 2005</i>	Abigail Fisher	postdoctoral fellow
<i>since 2005</i>	Jon Vaabenoe	postdoctoral fellow
<i>since 2005</i>	Yat Tang	predoctoral fellow
<i>since 2005</i>	Christina Taylor	postdoctoral fellow
<i>since 2005</i>	Yaniv Barda	postdoctoral fellow

f. Past advisees

1992-1994	Steve Kolodziej (postdoctoral fellow). Research scientist with Monsanto Co. in St. Louis, MO.
1992-1994	Tudor Oprea (postdoctoral fellow). Research scientist with the University of Mexico School of Medicine, Department of Biochemistry & Molecular Biology, and Director, Office of Biocomputing, Albuquerque, NM.
1992-1994	Mark Smythe (postdoctoral fellow). Staff scientist, Institute for Molecular BioScience, The University of Queensland, Brisbane, Australia.
1993-1994	Jia Luo (postdoctoral fellow). Staff scientist, Department of Chemistry, UCSB, Santa Barbara, California.
1993-1994	Toan Nguyen (postdoctoral fellow). Senior research scientist, Computer Design Infor. and Apps., Arqule, Inc., Woburn, MA.
1993-1995	David Chalmers (postdoctoral fellow). Research associate, Victoria College of Pharmacy, Parkville, Victoria, Australia.
1993-1995	Stuart Green (postdoctoral fellow). Lecturer, Department of Chemistry, University of Leeds, Leeds, England.
1993-1995	Ezequiel Quintana-Morales (postdoctoral fellow). Research scientist, Instituto de Investigaciones, Quimicas, Sevilla, Spain.
1993-1995	Ilya Vakser (postdoctoral fellow). Assistant Professor of Pharmacology, Medical University of South Carolina, Charleston, SC.
1994-1996	Dave Lowis (postdoctoral fellow). Scientist, Tripos, Inc., St. Louis, MO.
1994-1999	Chin Chi Chen (predoctoral fellow). Instructor, Department of Chemistry, University of Colorado, Colorado Springs, CO.
1995-1997	Yang Chen Fann (postdoctoral fellow). Staff scientist, NIEHS, NIH Research Triangle Park, NC.
1996-1998	Yasuo Takeuchi (postdoctoral fellow). Manager, Medicinal Chemistry Res. Ctr., Meiji Seika Kaisha, Ltd., Yokohama, Japan.
1996-1998	Rino Ragno (postdoctoral fellow). Assistant Professor, School of Pharmacy, Universita La Sapienza, Rome, Italy.
1996-1998	Rohit Pappu (postdoctoral fellow). Assistant Professor, BME, Washington University School of Medicine, St. Louis, MO.
1996-1998	Gergely Makara (postdoctoral fellow). Senior scientist, NeoGenesis, Inc., Cambridge, MA.
1997-1998	Fredrik Almqvist (postdoctoral fellow). Staff scientist, Pfizer Pharmaceuticals, St. Louis, MO.
1997-1999	Pi-Chin Chu (postdoctoral fellow). Unknown, NYC, NY.

1997-1999	Hoangmao Sun (postdoctoral fellow). Principal Scientist, Hoffman-La Roche, Inc., Nutley, NJ.
1998-1999	Anders Berglund (postdoctoral fellow). Staff Scientist, Pfizer Pharmaceuticals, St. Louis, MO.
1998-2001	Parissa Heshmati (postdoctoral fellow). Research Chemist, Rochester, NY.
1998-2001	Yungpeng Ye (postdoctoral fellow). Research Associate, Dept. of Optical Radiology, Sam Achilefu Lab, Washington University, St. Louis, MO.
1998-2002	Rieko Arimoto (predoctoral fellow). Staff Scientist, Vertex Pharmaceuticals, Inc., Cambridge, MA.
1998-2003	Ye Che (predoctoral fellow). Staff Scientist, NIH/NHLBI/DIR/LBC, Bethesda, MD.
1998-2004	Eric Welsh (predoctoral fellow). Research Associate, Depts. Of Biology and Computer Science, Washington University, St. Louis, MO.
2000-2001	Wei Sha (postdoctoral fellow). Oracle Database Administrator (DBA), Science Applications International Corporation (SAIC), Rockville, MD.
2000-2003	Andrea Reaka (postdoctoral fellow). Instructor, School of Pharmacy, SIU, Edwardsville, IL.
2000-2004	Yuan Gao (postdoctoral fellow). Senior Chemist, Ryss Lab, Inc., Union City, CA.
2001-2004	Yun Wu (postdoctoral fellow). Physical Scientist, Dept. of Radiology/Nuclear Medicine, Stanford University School of Medicine, Stanford, CA.
2000-2005	Lori Quick Anderson (predoctoral fellow). Research Associate, Between positions.
2000-2006	Matt Anderson (predoctoral fellow). Research Assistant, Dept. of Biochemistry and Molecular Bioorganic Program, Washington University, St. Louis, MO.

## 2. Regional and national contributions

### a. Invited scientific research seminars (2002-2005)

Aug. 02	27 <sup>th</sup> European Peptide Symposium. Sorrento, Italy
May 03	4th European Workshop on Drug Discovery. Certosa di Pontignano, Siena, Italy
May 03	Dedication Symposium of Institute of Molecular Sciences, University of Queensland, Brisbane, Australia
June 03	Dipartimento di Chimica Farmaceutica, Universita La Sapienza, Roma, Italy
June 03	Conference on Modeling of Protein Interactions in Genomes, SUNY, Stony Brook, NY
Mar. 04	Department of Biochemistry, University of New Mexico, Albuquerque, NM
June 04	Dedication Symposium of Institute of Structural Molecular Biology, University/Imperial Colleges, London
Sept. 04	3 <sup>rd</sup> Int. Peptide Symp. and 28 <sup>th</sup> European Peptide Symp. Prague, Czechoslovakia
Nov. 04	High-Throughput Technologies for in vivo Imaging Agents Workshop, National Cancer Institute, Washington, D.C.
Nov. 04	Annual Iberoamerican Research and Development Summit, Albuquerque, NM
Jan. 2005	Division of Biological Sciences, Nanyang Technical University, Singapore
Jan. 2005	21st Int. Conference on Magnetic Resonance in Biological Systems. Hyderabad, India
Jan. 2005	GVK Biosciences, Hyderabad, India
Feb. 2005	Department of Biomedical Engineering, UCSC, Santa Cruz, CA
Feb. 2005	Department of Biomedical Engineering, UC Davis, Davis, CA
April 2005	Midwest Computational Structural Biology Workshop (Michigan State University, Host) – Brook Lodge, MI
June 2005	Modeling of Protein Interactions in Genomes – Lawrence, KS
July 2005	Gordon Conference – Computer-Aided Drug Design, Tilton, NH
Aug. 2005	American Chemical Society National Meeting, Washington, D.C.

### Part III:

### Bibliography

#### A. Original Articles

1. Marshall, G.R. and R.B. Merrifield (1965) Synthesis of angiotensins by the solid-phase method. *Biochemistry* 4:2394-2401
2. Marshall, G.R. (1967) Studies on solid-phase peptide synthesis. *Diss. Abstr.* 282:540-B
3. Marshall, G.R. (1967) Studies with tryptophan in solid-phase synthesis. *Advan. Exp. Med. Biol.* 2:48. Also In: (1968) *Pharmacology of Hormonal Polypeptide and Proteins*, Plenum Press, pp. 48-51.
4. Ellis, R.A., S. Graesser, C.D. Barry and G.R. Marshall (1969) Molgraph: A program to manipulate and display molecular models. *Technical Memorandum 86*, Computer Systems Laboratory, Washington University, St. Louis, Missouri.
5. Barry, C.D., R.A. Ellis, S. Graesser and G.R. Marshall (1969) Chemgen *Technical Memorandum 87*, Computer Systems Laboratory, Washington University, St. Louis, Missouri
6. Barry, C.D., S. Graesser, R.A. Ellis and G.R. Marshall (1969) BURLESK. *Technical Memorandum 88*, Computer Systems Laboratory, Washington University, St. Louis, Missouri
7. Marshall, G.R. (1970) Conformation, computers and biological activity. In: *Peptides: Chemistry and Biochemistry*, B. Weinstein and S. Lande, Eds., M. Dekker, New York, pp. 151-162.
8. Pietta, P.G. and G.R. Marshall (1970) Amide protection and amide supports in solid-phase peptide synthesis. *Chem. Comm.* 650-651.
9. Barry, C.D., R.A. Ellis, S. Graesser and G.R. Marshall (1970) Molecular modeling with a small computer: An introduction and results of initial use. *Technical Memorandum 96*, Computer Systems Laboratory, Washington University, St. Louis, Missouri.
10. Flanigan, E. and G.R. Marshall (1970) Synthesis of cyclic peptides on dual function supports. *Tetrahedron Letters* 27:2403-2406.
11. Marshall, G.R., W. Vine and P. Needleman (1970) A specific competitive inhibitor of angiotensin II. *Proc. Natl. Acad. Sci. U.S.A.* 67(3):1624-1630.
12. Marshall, G.R. (1971) Studies on the biologically active conformations of angiotensin. Symposium on the Chemistry of Peptides. *Intra Science Chemistry Reports*, Santa Monica, Calif., 5:305-316.
13. Hancock, W.S., D.J. Prescott, W.L. Nulty, J. Weintraub, P.R. Vagelos and G.R. Marshall (1971) The synthesis of a protein with acyl carrier protein activity. *J. Am. Chem. Soc.* 93:1799-1800.
14. Pietta, P.G., P. Cavallo and G.R. Marshall (1971) 2,4-Dimethoxybenzyl as a protecting group for glutamine and asparagine in peptide synthesis. *J. Org. Chem.* 36:3966-3970.
15. Barry, C.D., R.A. Ellis, J.M. Fritsch, S.M. Graesser and G.R. Marshall (1971) Organic molecular models by computer. *Technical Memorandum 138*, Computer Systems Laboratory, Washington University, St. Louis, Missouri.
16. Marshall, G.R., N. Eilers and W. Vine (1972) Angiotensin II: A competitive inhibitor and analogs with restricted conformations. *Prog. Peptide Res.* 2:4-1, S. Lande, Ed., Gordon and Breach.
17. Flanigan, E. and G.R. Marshall (1972) Dual function supports in solid phase peptide synthesis. *Prog. Peptide Res.* 2:3-1, S. Lande, ed., Gordon and Breach.
18. Marshall, G.R. and H.E. Bosshard (1972) Angiotensin II: Studies on the biologically active conformation. *Circulation Res.* 31 (Suppl. 2):143-150.
19. Needleman, P.N., R.J. Freer and G.R. Marshall (1972) Angiotensin-receptor interactions: Influence of pH on angiotensin inhibition by Phe<sup>4</sup>-Tyr<sup>8</sup>-angiotensin II in rat uterine smooth muscle. *Arch. Int. Pharmacodyn.* 200(1):118-125.

20. Bosshard, H.E., C.D. Barry, J.M. Fritsch, R.A. Ellis and G.R. Marshall (1972) BURLESK: The use of systematic conformational searches in chemistry. In: *Proc. 1972 Summer Simulation Conference*, San Diego, 1:581. Also available as *Technical Memorandum 182*, Computer Systems Laboratory, Washington University, St. Louis, Missouri.
21. Glickson, J.D., W.D. Cunningham and G.R. Marshall (1972) Proton magnetic resonance study of angiotensin II (Asn<sup>1</sup>, Val<sup>5</sup>) in aqueous solution. In: *Chemistry and Biology of Peptides*, J. Meienhofer, Ed., Ann Arbor Science, Ann Arbor, pp. 563-569.
22. Marshall, G.R., J. Beitch, R.A. Ellis and J.M. Fritsch (1972) Macromolecular modeling system: The insulin dimer. *Diabetes* 21 (Suppl. 2):506-508.
23. Hancock, W.S., J.D. Prescott, G.R. Marshall and P.R. Vagelos (1972) Acyl carrier protein XVIII. Chemical synthesis and characterization of a protein with acyl carrier protein activity. *J. Biol. Chem.* 247:6224-6233.
27. Marshall, G.R., H.E. Bosshard, N.C. Eilers and P. Needleman (1972) Constraints on the receptor-bound conformation of angiotensin II. In: *Chemistry and Biology of Peptides*, J. Meienhofer, Ed., Ann Arbor Science Publishers, Ann Arbor, pp. 571-578.
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33. Marshall, G.R., W.S. Hancock, D.J. Prescott, W.L. Nulty, J. Weintraub and P.R. Vagelos (1973) Solid phase synthesis of acyl carrier protein. In: *Peptides 1971: Proc. 11th European Peptide Symposium*, H. Nesvadba, Ed., North-Holland Publishing Co., Amsterdam, pp. 185-194.
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44. Glickson, J.D., W.D. Cunningham and G.R. Marshall (1973) Proton magnetic resonance study of angiotensin II (Asn<sup>1</sup>Val<sup>5</sup>) in aqueous solution. *Biochem.* 12(19):3684-3692.
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47. Needleman, P., E.M. Johnson, Jr., S.B. Jakschik, J.R. Douglas, Jr. and G.R. Marshall (1974) Renal hormonal interactions and their pharmacological modification: Renin-angiotensin, catecholamines and prostaglandins. In: *Recent Advances in Renal Physiology and Pharmacology*, G.M. Fanelli and L.G. Wesson, Eds., University Park Press, Baltimore, pp. 197-214.
48. Needleman, P., G.R. Marshall and E.M. Johnson, Jr. (1974) Determinants and modification of adrenergic and vascular resistance in the kidney. *Am. J. Physiol.* 227(3):665-669.
49. Johnson, Jr., E.M., G.R. Marshall, J. Heist and P. Needleman (1974) Modification of responses to sympathetic nerve stimulation by the renin-angiotensin system in rats. *Br. J. Pharmac.* 51(4):541-547.
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## **B. Reviews**

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