

CURRICULUM VITAE

PERSONAL INFORMATION

Abdel A. Abdel-Rahman, Ph.D., FAHA
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EDUCATION

1970: B.Sc. Honors (Pharmacy), School of Pharmacy, Alexandria University, Egypt

1970-1973: M.S. (Pharmacology), School of Pharmacy, Alexandria University, Egypt

1973-1974: Ph.D. student, School of Pharmacy, Alexandria University, Egypt

1974-1979: Ph.D. (Pharmacology) School of Medicine, Leeds University, England

PROFESSIONAL EXPERIENCE

Sept 1970-March 1973. Department of Pharmacology, School of Pharmacy, Alexandria University, Egypt. Pharmacology Laboratory instruction to Pharmacy students and research leading to MS degree.

May 1973-November 1974. Department of Pharmacology, School of Pharmacy, Alexandria University, Egypt. Assistant Lecturer of Pharmacology and Ph.D. student. Conducted pharmacological and biochemical studies on scorpion venom. No degree granted because a governmental scholarship was granted to study for the Ph.D. degree in England.

November 1974-July 1979. Department of Pharmacology, School of Medicine, Leeds University, England. Pre-Doctoral Trainee. Laboratory instruction and tutoring to pharmacology and medical students. Research in Cardiovascular Pharmacology leading to Ph.D. degree. Studies dealt with neural control and baroreflex of blood pressure in normotensive and hypertensive animals.

Sept. 1979-Sept. 1982. Assistant Professor of Pharmacology. Department of Pharmacology, Faculty of Pharmacy, Alexandria University, Egypt.

Lecturing and Laboratory instruction in Pharmacology and Biological Assays to pharmacy students and directing graduate MS and Ph.D. students in Pharmacology. Research on presynaptic adrenergic receptors in cardiovascular regulation.

- Sept. 1982-October 1984. Visiting Scientist (on leave of absence from University of Alexandria, Egypt). Department of Pharmacology, School of Medicine, East Carolina University, Greenville, North Carolina, USA. Pharmacology Laboratory instruction to medical and graduate students. Research on arterial baroreflexes as a potential site of action for some calcium channel blockers and as a link factor in the alcohol-induced hypertension.
- March 1985-June 1989 Assistant Professor, Department of Pharmacology, School of Medicine, East Carolina University. Taught cardiovascular, renal and pulmonary pharmacology to medical and graduate students; served on a number of departmental and School committees, and performed research in the areas of central control of cardiovascular function and hypertension.
- July 1989-June 1994 Associate Professor, Department of Pharmacology, School of Medicine, East Carolina University. Teaching, research and service duties same as above. Research interests extended to study the role of adenosine and L-glutamate receptors in central areas that control blood pressure and baroreflexes.
- July 1994-present Professor, Department of Pharmacology, School of Medicine, East Carolina University. Same teaching and duties as above. Research on cardiovascular neurobiology utilizing molecular and neuroscience approaches. Role of estrogen and nitric oxide in gender differences in cardiovascular reflexes and responses to moderate amounts of ethanol.
- July 1997-present Adjunct Professor, Cardiovascular Center. This appointment has permitted the expansion of our research program and has facilitated the interactions and collaborations with other colleagues who undertake experimental and clinical studies on the cardiovascular system.
- July 1999-present **Distinguished Professor of Pharmacology**
- July 2003- **Director of Cardiovascular Research** Program, Department of Internal Medicine, East Carolina University School of Medicine.
- July 2006- **Vice Chair**, department of Pharmacology and Toxicology
- July 2006- Adjunct Professor of Surgery

ADMINISTRATIVE RESPONSIBILITIES AND PROFESSIONAL SERVICES:

A. Service to the Department, the Medical School and the University:

1. Department of Pharmacology Committees:

- 1986: Search Committee member for faculty recruitment
- 1986: Departmental Committee for establishing a core-course in pharmacological techniques for pharmacology graduate students.
- 1987: Departmental Committee for developing a graduate course in cardiovascular pharmacology
- 1988: Multidisciplinary Committee (Pharmacology, Physiology and Medicine) for developing an elective course on Hypertension.
- 1989-1990: Departmental Planning Committee
- 1993-present: Departmental Graduate Committee
- 1993: Departmental Committee to develop guidelines for tenure/promotions from Assistant to Associate Professorship.
- 1994-present: Personnel Committee, member
- 1998-present: Chairman of Personnel Committee
- 1994-present: Tenure and Promotion Committee, member
- 1998-present: Chairman of Tenure and Promotion Committee
- 1997-present: Peer evaluator of Teaching Effectiveness

2. Medical School/University Committees:

- 1988-1989: Member of the LCME Task Force
- 1988-1989: Member of the LCME Subcommittee for Graduate Education in the Sciences Basic to Medicine and Basic Science Departments
- 1989-1990: Member of the Research Incentives Committee
- 1990-1995 & 1998-2004: Member of the School of Medicine Research Committee
- 1993-1997: Member of the Information Systems Planning Management Committee
- 1992-2001: Member of the Research Committee, Center for Alcohol and Drug Abuse, East Carolina University School of Medicine
- 1994-2002: Member of the Research Committee, Cardiovascular Center,
- 1995-1996: Member of the School's LCME team, Faculty Committee

- 1995: Helped in the organization of the first East Carolina University School of Medicine Research Retreat and co-chaired one of the sessions
- 1997-present: Member of Research Task Force Committee
- 1997: Member of Selection Committee of a basic scientist and a physician scientist for the first School of Medicine Research Award (Ad Hoc)
- 1999-2002: Member, Student Affairs' Committee
- 1999-2003: Chair, School of Medicine Research Committee
- 2000-2001: Appointed by the Dean to serve on the newly created Research Endowment Board.
- 2003-2005 Member, BSOM Research Advisory Council
- 2007-present: Delegate to the United States Pharmacopeial Convention
- 2009-2012 LCME accreditation, Faculty Committee Co-Chair
- 2011-present: School of Dental Medicine Admissions Committee

3. East Carolina University Committees

- 1995-2012: Animal Care and Use Committee
- 1995: Research Infrastructure Committee (Ad hoc)
- 1999-2005 Member, the University's Office of Sponsored Program Council
- 1999-present: Basic Science Radiation Safety Committee
- 2006-2010 Faculty senator
- 2012-present: University Intellectual Property and Patent Committee

B. Service on Grant Review Boards:

- 1990-1995 & 1998-present: Reviewer for East Carolina University School of Medicine Biomedical Research Support Grants.
- 1990-1992: Member of the North Carolina American Heart Association Grant Review Subcommittee (reviews application and assign priority scores).
- 1992-1996: Member of the North Carolina American Heart Association Research Review Committee (decides on funding and research policy).

- 1998-present: Member, Special Emphasis Panel, National Institutes of Health
- 2003, 2004 Chaired, Special Emphasis Panel, National Institutes of Health
- 2004- Study Section Member, American Heart Association, Mid-Atlantic affiliate
- 2011 Chaired, Special Emphasis Panel, National Institutes of Health

C. State/National Professional Services:

- October 1985: Member of an ad hoc judging committee that selected the best presentations of pharmacology graduate students at Southeastern Pharmacology Society.
- August 1993: Reviewer of 60 Graduate Programs in Pharmacology as requested by the National Research Council
- 1991-1995 & 2007-present: Delegate of the ECU School of Medicine to the United States Pharmacopoeial Convention.
- 1995-1998: Education and Community Programs Committee, American Heart Association, North Carolina Affiliate.
- 1998-present: Member, North Carolina Congressional Liaison Committee
- 1998-present: Member, Society for Neuroscience Rapid Response Network

D. Serves as Editor/Reviewer:

A. Editor:

Biomedical Research International
Journal of Advanced Research
Dataset Papers in Science
Frontiers in Pharmacology

B. Reviewer:

Alcohol
Alcoholism: Clinical and Experimental Research
American Journal of Physiology
Brain Research
Clinical Sciences
Clinical and Experimental Hypertension
Circulation
Circulation Research
Drug Development Research

Drug and Alcohol Research
Hypertension
J. Neural Transmission
J. Pharmacology and Experimental Therapeutics
Life Sciences
Histology and Histopathology

E. Professionally Related Community Service:

Served as a judge for evaluating regional Science Fair projects held on ECU campus, 1987

Served as a judge for evaluating Science Fair Projects presented by Camden School System, Camden, North Carolina, February 1988.

Served as a judge for evaluating regional Science Fair projects held on ECSU campus; Elizabeth City, North Carolina, March 1988.

Member of the Research!North Carolina Regional Speakers Bureau, 1993

Member of the North Carolina Nephrology and Hypertension Network

TEACHING ACTIVITIES

A. Courses taught and coordinated:

1. Teach cardiovascular, renal and pulmonary pharmacology to medical students, ECU School of Medicine (1987-present).
2. Course director of Physician Assistant Pharmacology Course (1998-1999) in addition to teaching cardiovascular, renal and pulmonary pharmacology to PA students; ECU School of Medicine
3. Teach Cardiovascular Pharmacology to Graduate Students (since 1988); course director (2005-present)
4. Small group teaching, M-2 medical students, ECU School of Medicine (1985-2012).
5. Pharmacology Research Techniques Course (1999-)
6. Laboratory instruction and tutoring to pharmacology and medical students; Leeds University, England (1975-1979).
7. Taught and was course director of "Physiology for Pharmacy Students" and "Biological Assays and Drug Screening." University of Alexandria Faculty of Pharmacy, Egypt (1981-1982, 1984-1985).

8. Student Preceptor for Honors Medical Science Students, 1985-present, (one of the projects ranked first at local level and second at State level).
9. Student Preceptor for High School American Heart Association fellows (1993-1996)
10. Student Preceptor for Summer Venture Students, 1985-present,

B. Interdisciplinary teaching effort

- 1997- present: Invited by the department of Medical Humanities to participate in discussions on "Research Ethics" offered to the ECU School of Medicine Graduate Students.
- 1997-1998: Participated in a series of discussions that aimed at, and successfully lead to, the development of an Interdisciplinary Course in Neuroscience
- 2007- 2010: Teach in graduate Neuroscience course; East Carolina University
- 2011-present: Teach cardiovascular, renal and thrombotic pharmacology to School of Dental Medicine students

C. Curriculum development efforts:

1. Annual updating and revision of Handouts
2. Participated in developing a course on the use of pharmacological techniques in research for pharmacology graduate students, East Carolina University School of Medicine.

D. Self-development as a teacher:

Attendance at teaching workshops sponsored by:

1. The University of Alexandria, Egypt
2. The University of Leeds, England
1. East Carolina University, Greenville, North Carolina

E. Contribution to Graduate and Post-Doctoral Training:

1. Graduate Student Training:

Graduate Supervision:

M. M. Mohy El-Din (Ph.D. 1979-1982); Currently Professor of Pharmacology; Alexandria University College of Pharmacy, Egypt

Esmat M. Mahmoud (Ph.D. 1984-1985); Currently Research Scientist, National Institute of Health; Cairo, Egypt

Ahmed I. Al-Mallah (MS. 1980-1982). Currently Professor, Department of Pharmacology, Alexandria University College of Pharmacy, Egypt

Roy Russ (Ph.D 1987-1989; co-advisor); Currently Associate Professor of Pharmacology and Director of Basic Sciences Department, Mercer University, Macon, Georgia

Eric Hawkins (MS 1990-1992); Currently Research Assistant; Rorer

Greg Ward (Ph.D. 1998-2002): Currently Assistant Professor, Wake Forest State University, North Carolina

Hossam Shaltout (Ph.D., 2000-2005); currently Assistant Professor of Pharmacology, Alexandria University College of Pharmacy, Alexandria, Egypt

Noha Nassar (Ph.D., 2003-2006); currently Assistant Professor of Pharmacology, Cairo University College of Pharmacy, Cairo, Egypt

Tara Bender (Ph.D., 2003-2007). Currently, Research Associate, Neuroscience Program, Medical University of South Carolina

Badr Ibrahim (Ph.D., 2007-2010). Currently, Retail Pharmacist

Marie McGee (Ph.D., 2008-2012). Currently, Research Associate at Environmental Protection Agency

Anusha Penumarti (2010-)

Samar Rezq (2012-)

Shaimaa El-Sayed (2013-)

Asmaa Ibrahim (2013-)

Graduate Dissertation Committees:

Shannon P. Williams (Ph.D 1985-1988)

So Wong (Ph.D 1986-1990)

Michael Clark

Sehr Khan (Ph.D 1993-1997)

Dan Cushing (Ph.D)

Mark Henderson

Amy Roscoe (Ph.D 1993-1996)

Shawn Barwick (Ph.D.)

Rebecca Wright (Ph.D. 1997-2000)

Kevin DeSanty (Ph.D. 1999-2002)

Lou Ann Cuthbertson (Ph.D. 1999-2002)

Patrick M. Navolanic (Ph.D. 1999-2000; transferred)
Charles Hammonds (Physiology Dept. M.S. 1998-1999)
Steve A. Simandle (Physiology Dept. Ph.D., 1998-2002)
Justin Brown (Physiology Dept., Ph.D., 1998-2003)
Huda Tawfik (Ph.D., 2002-2006)
Peter Oldenburg (Ph.D., 2000-2005)
Hercules Maguma (Ph.D., 2006-2010)
Alexander Kiraly (Ph.D., 2007-2013)
Qixiao Jiang (2009-2013)
Kathleen Gavin (Ph.D., 2010-2012)
Ben Thompson (Ph.D., 2010-)
Taylor Mattox (Ph.D., 2011-2014)
Lalage Katunga (Ph.D., 2012-2015)
Benjamin D. Putnam, M.D. (MS., 2013-)

2. Post-Doctoral Training/Mentoring:

Xin Zhang (1985-1990). Currently Research Associate, Department of Pharmacology, Loyola University, Chicago.

Shiyong Tao (1990-1992). Currently Senior Research Associate, Naval Research Institute, Bethesda

Mahmoud El-Mas (1991-1993; 1996-1999). Currently Professor of Pharmacology; Alexandria University College of Pharmacy, Egypt

Limin Mao (1993-1997). Currently Research Professor, Department of Pharmacology, School of Pharmacy, Kansas City, MO

Jian Zhang (1996-2008)

Mohamed K. Mohamed (1997-1999). Currently, Fellow Department of Medicine, University of Pittsburg

Guichu Li (1998-2010)

Xu Wang (1999-2004)

Ming Fan (2005-2012)

Aurel Strat (2008-2010)

Noha Nassar (2009-2010)

Badr Ibrahim (2011-2013)

Fanrong Yao (2012-)

Rebecca Steagall (2013-)

F. High School American Heart Fellows, Honors Med, and Undergraduate Honors

- Frank Sutton (1987/88; Kinston)
- Reba Ducas (1993, 1994 as American Heart Fellow and Honors Med)
- Kevin Bass (1994/95; J. H. Rose)
- Holly Burton (1995/96; North Pitt)
- Melanie Chelednik (1995/96; D. H. Conley)
- Sheena Waters (1998/99; American Heart and 1999/2000 Honors Med)
- P. G. Shelton (1999; East Carolina University Honors Program)
- Carrie Brinkley (2000; Kings Mountain High School)
- Sarah Ruth Keilson (2001; North Raleigh Christian Academy)
- Caroline Eubanks (2002; Summer Venture)
- Amrita Devalapalli (2004; Summer Venture)
- Ashley Michelle Tsang (2005; East Chapel Hill High School)
- Dori Lane Faulk (2006; South Columbus High School)

HONORS AND AWARDS

A. Teaching Awards:

1. Teaching Recognition Award, East Carolina University School of Medicine, awarded May 1993 by the Class of 93
2. Selected by the M-2 Class (Class of 96) as the most effective teacher in the Pharmacology Department for the first half of the semester
2. Nominated by the Department of Pharmacology for the University of North Carolina Board of Governors Award for Excellence in Teaching, February 1995.
4. Teaching Recognition Award, East Carolina University School of Medicine, awarded May 1993 by the Class of 95
5. Teaching Recognition Award, East Carolina University School of Medicine, awarded April 1995 by the Class of 97
6. Nominated by the Department of Pharmacology and the School of Medicine for the Alumni Distinguished Professor for Teaching Award (December 1995).
7. Nominated by the Department of Pharmacology for the School of Medicine Excellence in Teaching Award (March 1996)
8. Excellence in Teaching Award; awarded April 1996 by the Class of 98
9. Nominated by the Department of Pharmacology and the School of Medicine for the Board of Governor's Distinguished Professor for Teaching Award (December 1996). Recognized by the Chancellor as a finalist for this award (April 1997)
10. Nominated by the Department of Pharmacology For the East Carolina University Distinguished Research and Creative Activity Award (December 1999)

11. The Brody School of Medicine Master Educator Award; Fall 2002
12. Nominated by The Brody School of Medicine and finalist for the University of North Carolina Board of Governors Award for Excellence in Teaching. Fall 2002
13. Best lectures award; awarded during Faculty Appreciation Ceremony, April, 2007
14. Nominated for best teacher award in basic sciences, Spring 2013

B. Research/Creative Activity Awards:

- 1999 **Life-time achievement Award** for Excellence in Research and Creative Activity. This is the highest award granted by East Carolina University in the field of research and creative activity.
- 1999- **Distinguished Professor of Pharmacology**. This title is conferred by the University in recognition of outstanding research achievement, judged by the quality and quantity of publications and funding by the NIH
- 2004 &
2007 **Valentine Award:** an award presented by ECU Medical School to the most competitive graduate student. Two of my graduate students (Dr. Hossam Shaltout and Dr. Noha Nassar) have received this prestigious award.
- 2008 **Kuwait Foundation for Advancement of Science Award.**

C. President, East Carolina University Chapter for Neuroscience 2008-2010.

D. Exemplary academic performance:

1. Academic Performance for the 5-year period 1993/94-1997/98 (post-tenure review) ranked "Exemplary" by the Department of Pharmacology
2. East Carolina University Excellence in Research and Creative Activity Award along with conferral of "Distinguished Professorship". Spring 1999.
3. Exemplary academic performance (post-tenure evaluation) for the 5 year period 1998-2003 and 2004-2009

D. Travel Awards:

1. Southeastern Pharmacology Society, Key Biscayne, Florida, 1985
2. Eli Lilly and Company Travel Award to attend a Symposium on "Potassium Channel Openers" held in conjunction with the American Society of Hypertension Meeting in New York, May 1988.
4. I.R.I Servier (France) to participate in Neural Mechanisms in Hypertension Symposium held in Strasbourg, France, June 1996 (Partial Support).

PROFESSIONAL SOCIETIES

American Society for Pharmacology and Experimental Therapeutics (1988-)
American Heart Association (Council on High Blood Pressure; 1988-)
Fellow, American Heart Association (2006-)
American Physiological Society (1997-)
American Autonomic Society (1996-)
Society for Neuroscience (1996-)
Southeastern Pharmacology Society (1985-)
Southeastern Hypertension Consortium (1996-)
New York Academy of Science (1997-)
American Society for Hypertension (1986-)
Society for Experimental Biology and Medicine (1986-)
Sigma Xi (1987-)
American Association for the Advancement of Science (1985-)
North Carolina Association for Biomedical Research (1990-)
Fellow, American Heart Association (Council on High Blood Pressure, 2006-)
American Association of Colleges of Pharmacy
Cell Stress International Society
Pharmacology for Africa Initiative

FUNDED GRANTS

"Actions of Antihypertensive Drugs on Baroreceptor Function". **Principal Investigator**, July 1, 1983 to June 30, 1984; Source: East Carolina University, School of Medicine, "Starter Grant". \$1,500

"Shared Equipment Grant", **Co-investigator**, July 1, 1983; Source: East Carolina University School of Medicine. \$4,000

"Effect of Ethanol on Cardiovascular Actions of Clonidine". **Principal Investigator**, July 1, 1986 to June 30, 1987. American Heart Association, North Carolina Affiliate, Inc. \$15,000.

"The Acute Effects of Ethanol on Arterial Baroreceptors" **Principal Investigator**, July 1, 1986-June 30, 1987. Source: East Carolina University School of Medicine "Biomedical Research Support Grant" \$1,500

"Negative Impact of Alcohol on Antihypertensive Therapy." **Principal Investigator**. September 1, 1988-August 31, 1993; extended with supplement till

August 31, 1994. Source: National Institute on Alcohol Abuse and Alcoholism. \$349,712

"Central Hemodynamic Effects of Adenosine" July 1, 1991-June 30, 1992. **Collaborating Investigator**. Principal Investigator, Dr. S. Tao, Research Associate in my laboratory. Source: East Carolina University School of Medicine. \$2,000

"Functional Interaction between Aortic Baroreceptors and Central α_2 -Adrenergic and Imidazole Receptors" July 1, 1992-June 30, 1993. American Heart Association, North Carolina Affiliate, Inc. **Collaborating Investigator**. Principal Investigator, Dr. M. M. El-Mas, Research Associate in my laboratory. \$10,000

"Role of Glutamate Receptors in the Depressant Effect of Ethanol on Baroreflexes". July 1, 1992-June 30, 1993. **Collaborating Investigator**. Principal Investigator: Dr. M. M. El-Mas, Research Associate in my laboratory. Source: East Carolina University School of Medicine. \$2,600

"Ethanol and Central Regulation of Cardiovascular Activity" July 1, 1993-June 30, 1994. **Collaborating Investigator**. Principal Investigator, Dr. Limin Mao, a Research Associate in my laboratory. Source: East Carolina University School of Medicine. \$2,200

"Shared Grant Application to purchase a Microdialysis System". Grant Coordinator. Shared with Drs. M. S. Dar and J. McGinty. NIH; 1993; \$23,000

"Negative Impact of Alcohol on Antihypertensive Therapy." **Principal Investigator**. August 1, 1995-July 31, 2000. Source: National Institutes on Alcohol Abuse and Alcoholism. Total costs, \$766,694.

"Pre- and Postmenopausal Hemodynamic Responses to Alcohol". **Principal Investigator**. April 1, 1996-March 31, 2000. Source: National Institute on Alcohol Abuse and Alcoholism. Total Costs: \$504,231

"Shared Grant Application" to the North Carolina Biotechnology Center to purchase the first Confocal Microscopy System at East Carolina University. Principal Investigator: Art Bode, Department of Pathology. January 2000; Cost: \$200,000

5RO1 AA07839 Competing renewal of the NIH grant "Negative Impact of Alcohol on Antihypertensive Therapy." **Principal Investigator**. June 1, 2000-May 31, 2005. Source: National Institutes on Alcohol Abuse and Alcoholism. Total cost, \$1,524,689.

N00014-01-1-0099 Alex Murashov (PI); 11/01/00-10/31/02
Department of Navy/ONR "Neural Signaling Activated by Pro-Inflammatory Cytokine following Trauma"
Role: **Co-Principal Investigator**. Total cost: \$300,000

1R21AG19209-01A2 Robert C. Hickner (PI). Exercise, muscle nutritive blood flow and eNOS in aging. **Co-Investigator**

NIH/NIA, 09/01/02-08/31/04. Total cost: \$418,500

1R01 AA14441-01 Mechanism of Alcohol-Estrogen Hemodynamic Interaction." **Principal Investigator.** Source: National Institutes on Alcohol Abuse and Alcoholism. May 1, 2004-April 30, 2009. Total costs, \$1,736,410 (Direct Cost, \$237,500/year).

1F31 AA015472-01 Mechanism of ethanol-clonidine synergistic sedation. Source: National Institutes on Alcohol Abuse and Alcoholism. Applicant: Ms. Tara Bender (Ph.D. student). Role: **mentor.** January 1, 2005-December 31, 2008

2R01 AA07839-14 "Negative Impact of Alcohol on Cardiovascular Neurobiology" **Principal Investigator.** June 1, 2007-May 31, 2012. Source: National Institutes on Alcohol Abuse and Alcoholism. Total cost, \$2,524,689. April 1, 2007-March 31, 2012

1R01 HL085752-01A2 (Yan Hua Chen, PI). The Function of Claudin-7 in Renal Epithelial Cells. 07/10/2008-06/31/2013
NIH National Heart, Lung, and Blood Institute \$1,601,980 (total for 5 years)

2R01 AA14441-07 Mechanism of Alcohol-Estrogen Hemodynamic Interaction. **Principal Investigator.** Source: National Institutes on Alcohol Abuse and Alcoholism. September 1, 2001-May 30, 2016. Total costs, \$1,773,935.

RESEARCH INTERESTS

A. General Area of Research Interest.

Cardiovascular pharmacology and Neuropharmacology: Earlier work dealt with: (i) pharmacological treatment of experimental gastric ulcer; (ii) cardiovascular and neuromuscular effects of scorpion venom; and (iii) role of presynaptic adrenergic receptors in modulating smooth and skeletal muscle contraction.

B. Specific Areas of Current and Future Research.

Neural control of blood pressure with emphasis on central pathways involved in the neuropharmacological actions of centrally acting hypotensive agents and ethanol. A major objective of these studies is to elucidate the mechanism of an adverse hemodynamic interaction between alcohol and centrally acting antihypertensive drugs of the imidazoline group. These NIH supported studies focus on the role of brainstem imidazoline and different subtypes of α_2 adrenergic receptors in blood pressure control and as targets for alcohol action. Our laboratory also investigates the role of the excitatory amino acid L-glutamate, adenosine and their receptors in modulating arterial pressure via interaction with arterial baroreceptors and their projections. Molecular and gene expression studies are undertaken to explain the mechanism of interesting clinically relevant neuropharmacological findings obtained in the intact animal. Funding of our competing NIH grant has supported our efforts to utilize modern molecular and neuroscience approaches germane to the specific aims delineated in our application.

The role of estrogen and its receptor subtypes in gender differences in arterial baroreceptor function and the hemodynamic responses to ethanol is another area of interest. NIH funding of these studies has supported the investigation of whether ethanol compromises the protective cardiovascular actions of estrogen replacement therapy. This project investigates potential alterations in NO synthesis and in the kinetics and function of estrogen receptors in ovariectomized rats and the impact of estrogen treatment on these alterations. In addition to gaining basic knowledge on the effects of ethanol on the cardiovascular system, findings of our ongoing and planned studies are expected to yield physiologically relevant information. Ongoing studies utilize modern molecular neuroscience approaches to trace central pathways and signal transduction processes that mediate the neural and cardiovascular effects of estrogen.

Methodologies used in our studies have been based on modern state-of-the-art system, cellular and molecular neuroscience approaches to address clinically relevant biomedical questions. These methodologies include microinjections into and microdialysis within discrete brain areas, and cannulation of blood vessels for measurements of arterial pressure, cardiac output (thermodilution) and its derivatives in conscious rats. NIH funds made it possible to purchase a radiotelemetric system (40 units) for extended (3-4 months) uninterrupted recording of blood pressure, heart rate, respiration rate and activity in conscious rats. Electrophysiological measurements of neuronal firing rate at the site of microinjection, recording of sympathetic neural activity and on-line measurement of norepinephrine and its metabolites in discrete brain areas by *in vivo* electrochemistry (carbon fiber) have been performed in our studies.

Other valuable techniques in the fields of pharmacology and neuroscience used in our recent studies include receptor binding by quantitative autoradiography. Gene expression assessed by *in situ* hybridization is currently employed. Other techniques successfully employed in ongoing preliminary studies include the utilization of selective biosensors for the *in vivo* on-line measurements of nitric oxide in discrete brain areas of conscious rats and in cultured vascular endothelia cells utilizing the *in vivo* voltammetry technology. A new fluorescence imaging system (also allows edge detection) has been added to my lab to help us undertake pharmacological studies at the cellular and molecular level. Studies are underway on the molecular biology of nuclear receptors with focus on estrogen receptors in vascular smooth muscle cells and brainstem neurons utilizing standard molecular approaches, e.g. RT-PCR, gel shift assay, etc. These studies will help explain the neurobiological effects of estrogen observed in whole animals in our previous and ongoing studies.

PARTICIPATION IN SYMPOSIA AND INVITED SEMINARS:

- December 1991: Invited by Huazhong University of Science and Technology and by Tongji Medical University, Wuhan, Hubei, P. R. China to present a seminar and a lecture to the Faculty and students.
- August 1993: Glasgow, Scotland. Our presentation was a part of a Symposium on Spinal Autonomic Neurons organized by Professor J H Coote of the University of Birmingham, England, at the IUPS meeting.
- March 1996: Department of Pharmacology, University of Southern California School of Pharmacy, Los Angeles, California

- May 1996: Department of Pharmacology, University of Arkansas for Medical Sciences; Little Rock Arkansas
- April 1996: Department of Pharmacology and Toxicology; Medical College of Virginia; Virginia Commonwealth University; Richmond; Virginia.
- June 1996: Neural Mechanisms in Hypertension. Strasbourg, France. Organizer. Professor P. Bousquet
- August 1997: Department of Pharmaceutical Sciences, School of Pharmacy, Northeastern University, Boston, Massachusetts
- September 1997: Department of Physiology, Kansas State University, Manhattan, Kansas
- November 1997: Seminar, Hypertension Center, Wake Forest University School of Medicine; Winston-Salem
- January 1998: Invited by the University of Alexandria to present a series of seminars and lectures to the faculty and graduate students at the University of Alexandria Schools of Medicine and Pharmacy, Alexandria, Egypt.
- May 1998: 6th International Symposium on Adenosine and Adenine Nucleotides; Ferrara; Italy. Invited Speaker. Organizers: Professors A. Borea and G. Baraldi.
- October 1998: Presidential Symposium, North Carolina Chapter of Neuroscience; National Institute of Environmental Health Sciences; Research Triangle, NC
- November 2000: Public presentation organized by East Carolina University in recognition of the Lifetime achievement award in Research and Creative Activity and with the conferral of "Distinguished Professor of Pharmacology"
- April 2003: Seminar, College of Pharmacy, University of Houston, Texas
- December 2006: Presentation/session co-chair at the biannual meeting of the Association of the Egyptian American Scholars. Cairo, Egypt
- February 2007: Invited speaker, International Conference on February 22-24, 2007 dedicated to Prof. AS Paintal. Delhi, India
- April 2007: Caveolin: An important signaling molecule in cardiac baroreflex modulation. Department of Physiology, East Carolina University School of Medicine
- December 2008: Estrogen and Ethanol: A Good Mix for the Heart? Kuwait University School of Medicine, Kuwait City, Kuwait

- April 2009: Two seminars, Department of Pharmacology, University of Montreal, Canada
- July 2010: Invited to participate and present talks at the FASEB Summer Conference, Saxton River, Vermont
- June 2012 Invited to present a talk as a part of a Symposium at the Research Society on Alcoholism Meeting, San Francisco, California

PUBLICATIONS

A. Theses

MS "Pharmacological Studies in Production and Prevention of Experimental Gastric Ulcer". Department of Pharmacology, Faculty of Pharmacy, Alexandria University, Egypt. 1973

Ph.D. "Observations on the Sympathetic Nervous System in Blood Pressure and Heart Rate Regulation". Department of Pharmacology, School of Medicine, Leeds University, England. 1979

B. Articles in Refereed Journals

1. Ghazal, A. Ismail, M., **Abdel-Rahman, A-R. A.** and El-Asmar, M. F. Pharmacological studies of scorpion (*Androctonus amoreuxi*, Aud & Sav) venom. *Toxicon*, 13: 253-259, 1975.
2. Ismail, M., Ghazal, A., El-Asmar, M. and **Abdel-Rahman, A-R. A.** Immunological studies with scorpion (*Androctonus amoreuxi*, Aud & Sav) venom. *Toxicon*, 13: 405-408, 1975.
3. **Abdel-Rahman, A-R. A.** and Sharabi, F. M. Presynaptic alpha-receptors in relation to the cardiovascular effect of yohimbine in the anesthetized cat. *Arch. int Pharmacodyn.*, 252: 229-240, 1981.
4. Bakry, N.M., **Abdel-Rahman, A-R. A.**, Mohy El-Din, M. M., Zeitoun, R., and Abdel-Aziz, A. Effect of atenolol on the neuromuscular transmission: Physiological and Biochemical Considerations. *J. Egyptian Soc. Toxicol.*, 1:18-32, 1984.
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