BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Elise Peery Gomez-Sanchez

eRA COMMONS USER NAME (credential, e.g., agency login): EGOMEZSANCHEZ

POSITION TITLE: Professor of Pharmacology & Physiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Case Western Reserve University, Cleveland, OH	BS	1971	Biology
Texas A & M University , College Station, Texas	DVM	1977	Veterinary Medicine
Southwestern Medical School, Dallas, Texas	Post-doc	1977-8	Pharmacology
Texas A & M University , College Station, Texas	PhD	1982	Physiology & Pharmacology

NOTE: The Biographical Sketch may not exceed five pages. Follow the formats and instructions below.

A. Personal Statement

My research has had two primary focuses: 1) regulation of the synthesis and action of aldosterone, cortisol and corticosterone and 2) the biology of the mineralocorticoid receptor (MR), including its role in pathological cardiovascular remodeling and hypertension and in hemodynamic control centers in the brain, and mechanisms for MR ligand specificity, reviewed in(1, 2). To this end I use a variety of techniques in *in vivo* physiology and pharmacology, cell culture, biochemistry, molecular biology, and histology. My work has focused on MR action in PVN, yet MR are most abundant in the hippocampus, where they mediate normal affect and cognition and are crucial for neuronal health. Depression, dementia and cardiovascular diseases are independent risk factors for each other. My recent move to a full time position in the Department of Pharmacology & Toxicology greatly facilitates collaborations with others in basic sciences. My association with the Departments of Neurobiology & Anatomical Sciences and Psychiatry through the interdepartmental Program in Neurosciences, provides an opportunity to acquire behavioral and neurobiological expertise to focus on the interface between cardiovascular and neurocognitive diseases. Among techniques used are behavioral, pharmacological and physiological studies in animals, biochemistry and molecular biology, and histopathology and immunohistochemistry.

1. Gomez-Sanchez EP 2014 Brain mineralocorticoid receptors in cognition and cardiovascular homeostasis. Steroids 91C:20-31
2. Gomez-Sanchez E, Gomez-Sanchez CE 2014 The multifaceted mineralocorticoid receptor. Comprehensive Physiology 4:965-994

B. Positions Honors

1980-1983: Instructor- Department of Internal Medicine, University of South Florida College of Medicine
1983-1993: Associate Professor, Departments of Internal Medicine & Pharmacology (adjunct), University of South Florida College of Medicine
1984-1993: Research Physiologist, James A Haley Veterans Administration Hospital, Tampa, FL

1993-1997: Associate Professor: Depts. of Internal Medicine, College of Medicine, & adjunct in Biomedical Sciences, College of Veterinary Medicine, University of Missouri-Columbia
1997-1999: Professor: Depts. of Internal Medicine, College of Medicine, & adjunct in Biomedical Sciences College of Veterinary Medicine, University of Missouri-Columbia
1993-1999: Research Scientist: Harry Truman VAMC, Columbia, MO.
1999- 2014: Professor: Department of Medicine & adjunct in Pharmacology & Toxicology and Neurobiology Anatomical Sciences, University of Mississippi Medical Center, Jackson MS.
1999-2014: Research Scientist: GVS Montgomery VAMC, Jackson MS.
2012-2013: Acting ACOS for Research, G.V. Montgomery VA Medical
2014- Professor: Department of Pharmacology & Toxicology & adjunct in Medicine and in Neurobiology Anatomical Sciences, University of Mississippi Medical Center, Jackson MS.

Honors

Associate Editor: *Cardiorenal Medicine:* 2013-present
Member, Program in Neuroscience Executive Committee: 2014-present
Biosafety Officer, G.V. Montgomery VAMC, April 2010-present
Chairman, Radiation Safety Committee, G.V. Montgomery VAMC Center 2001-present
Chairman, Research Safety Committee, 2000-2010
NIH Study Sections: SBIR, Cardiovascular & Renal (reorganized to Hypertension & Microcirculation) 2003-2007; ZRG 2009-2010; CMRC: 2008-2012.
American Heart Association study sections: 1989-1994; 2008; 2013-present.
Veterans Affairs study sections: various: 1990-2013
Editorial Board: *Hypertension* 12/1997-2012; *Endocrinology* 2006-2010
Fellow, Council for High Blood Pressure Research, American Heart Association, 1995-present
Board of Professional Regulation for Veterinary Medicine in Florida 1987-1991; 1992-1993

C. Contribution to Science

http://www.ncbi.nlm.nih.gov/sites/myncbi/1z5ENUr_k7QkU/bibliography/41291836/public/?sort=date&direction=ascending

1. I was the first to directly confirm the role of brain mineralocorticoid receptors (MR) in hypertension by demonstrating that the intracerebroventricular (icv) infusion of aldosterone at a dose that does not increase circulating aldosterone induces hypertension(3) and that the icv infusion of an MR antagonist at a dose that is ineffective systemically, blocks the hypertension induced by systemic aldosterone excess and salt-induced hypertension in Dahl Salt-Sensitive Rats(4, 5). I also was first to report that mechanisms of MR action in the kidney including epithelial sodium channel activation are also involved in CNS regulation of the blood pressure(6, 7).
2. My studies showed that MR-induced pathological cardiovascular remodeling occurred independently of hypertension(8), supporting the concept tested by the RALES clinical trial that showed that an MR antagonist significantly ameliorates heart failure at doses that do not lower blood pressure(NEJM 341:709-17; 1999). MR antagonists are now standard therapy for heart failure and are increasingly used routinely to slow renal and pulmonary fibrosis.
3. My studies of mechanisms for MR ligand specificity led to studies of splice variants and post translational modifications of the MR and enzymes of pre-receptor ligand modulation(9, 10). To do this we produced the first truly specific antibodies to detect the MR(11, 12), 11β-hydroxysteroid dehydrogenase 2 (HSD2) and H6PDH and demonstrated how aldosterone activates MR in pre-sympathetic neurons of the PVN despite the stoichiometric advantage of CNS glucocorticoid concentrations(13).
4. I was the first to demonstrate that all of the steroidogenic enzymes required for aldosterone, cortisol and corticosterone synthesis from cholesterol were expressed and active in the human and rat brain(14-17) and that this extra-adrenal synthesis was relevant to hypertension in the Dahl SS rat(18).
5. To do this we had to develop very sensitive antibodies and assays to measure minute quantities of aldosterone and corticosterone in tissues. Our aldosterone antibody is used in the most widely sold human clinical assays in the USA (Millipore). Among the many antibodies we have produced, those that distinguish between the human CYP11B1 & 2 enzymes required for the last step in synthesis of cortisol and aldosterone (19), which we give free to any non-commercial user, have revolutionized the diagnosis and study of mechanisms for human primary aldosteronism(20). All of the reagents developed for our studies, including poly- and monoclonal antibodies (donated to ATCC and NIH Developmental Studies Hybridoma Bank), cell models, plasmids, and viral vectors are disseminated free to other investigators.

I now propose to redirect my focus to mechanisms common to cardiovascular, cerebrovascular and cognitive disease.

3. Gomez-Sanchez EP 1986 Intracerebroventricular infusion of aldosterone induces hypertension in rats. Endocrinology 118:819-823
4. Gomez-Sanchez EP, Fort CM, Gomez-Sanchez CE 1990 Intracerebroventricular infusions of RU28318 blocks aldosterone-salt hypertension. Am J Physiol 258:E482-E484
5. Gomez-Sanchez EP, Fort C, Thwaites D 1992 Central mineralocorticoid receptor antagonism blocks hypertension in Dahl S/JR rats. Am J Physiol 262:E96-E99
6. Gomez-Sanchez EP, Gomez-Sanchez CE 1994 Effect of central amiloride infusion on mineralocorticoid hypertension. Am J Physiol 267:E754-E758
7. Gomez-Sanchez EP, Gomez-Sanchez CE 1995 The effect of the central infusion of benzamil on Dahl S rat hypertension. Am J Physiol 269:H1044-H1047
8. Gomez-Sanchez EP 1995 Mineralocorticoid modulation of central control of blood pressure. Steroids 60:69-72
9. Gomez-Sanchez EP, Gomez-Sanchez CE 1992 Central Hypertensinogenic effects of glycyrrhizic acid and carbenoxolone. Am J Physiol 263:E1125-E1130
10. Gomez-Sanchez EP, Ganjam V, Chen YJ, Liu Y, Clark SA, Gomez-Sanchez CE 2001 The 11beta hydroxysteroid dehydrogenase 2 exists as an inactive dimer. Steroids 66:845-848.
11. Gomez-Sanchez CE, de Rodriguez AF, Romero DG, Estess J, Warden MP, Gomez-Sanchez MT, Gomez-Sanchez EP 2006 Development of a panel of monoclonal antibodies against the mineralocorticoid receptor. Endocrinology 147:1343-1348
12. Gomez-Sanchez CE, Warden M, Gomez-Sanchez MT, Hou X, Gomez-Sanchez EP 2011 Diverse immunostaining patterns of mineralocorticoid receptor monoclonal antibodies. Steroids 76:1541-1545
13. Chen J, Gomez-Sanchez CE, Penman A, May PJ, Gomez-Sanchez E 2014 Expression of mineralocorticoid and glucocorticoid receptors in preautonomic neurons of the rat paraventricular nucleus. Am J Physiol Regul Integr Comp Physiol 306:R328-340
14. Gomez-Sanchez CE, Zhou MY, Cozza EN, Morita H, Eddleman FC, Gomez-Sanchez EP 1996 Corticosteroid synthesis in the central nervous system. Endocr Res 22:463-470
15. Gomez-Sanchez CE, Zhou MY, Cozza EN, Morita H, Foecking MF, Gomez-Sanchez EP 1997 Aldosterone biosynthesis in the rat brain. Endocrinology 138:3369-3373
16. Yu L, Romero DG, Gomez-Sanchez CE, Gomez-Sanchez EP 2002 Steroidogenic enzyme gene expression in the human brain. Mol Cell Endocrinol 190:9-17
17. Gomez-Sanchez EP, Ahmad N, Romero DG, Gomez-Sanchez CE 2005 Is aldosterone synthesized within the rat brain? Am J Physiol Endocrinol Metab 288:E342-346
18. Gomez-Sanchez EP, Gomez-Sanchez CM, Plonczynski M, Gomez-Sanchez CE 2010 Aldosterone synthesis in the brain contributes to Dahl salt-sensitive rat hypertension. Exp Physiol 95:120-130
19. Gomez-Sanchez CE, Qi X, Velarde-Miranda C, Plonczynski MW, Parker CR, Rainey W, Satoh F, Maekawa T, Nakamura Y, Sasano H, Gomez-Sanchez EP 2014 Development of monoclonal antibodies against human CYP11B1 and CYP11B2. Mol Cell Endocrinol 383:111-117
20. Nakamura Y, Maekawa T, Felizola SJ, Satoh F, Qi X, Velarde-Miranda C, Plonczynski MW, Ise K, Kikuchi K, Rainey WE, Gomez-Sanchez EP, Gomez-Sanchez CE, Sasano H 2014 Adrenal CYP11B1/2 expression in primary aldosteronism: Immunohistochemical analysis using novel monoclonal antibodies. Mol Cell Endocrinol 392:73-79

(Selected publications of 123)

D. Research Support

Current:

RO1-HL 27255-30, NIH/NHLBI; "Role of mineralocorticoids in hypertension" 8/1/2014 to 5/30/2018.
PI: Celso E. Gomez-Sanchez;
Co-I: Elise P. Gomez-Sanchez: role: joint design of experiments; all animal work; histological interpretation, manuscript preparations

The goal is to elucidate the role of neural regulation of aldosterone synthesis and adrenal zona glomerulosa stem cell migration and differentiation in the adult. Questions to be answered include How aldosterone synthesis is stopped more rapidly than current know mechanisms allow and Why this does not occur in individuals with low renin hypertension, heart failure idiopathic primary aldosteronism.

Completed since 2013:

VA Merit Review, BLRDS; "Aldosterone Action in the Brain: Hypertension and Inflammation" 4/09-3/13(14)
PI
The goal was to elucidate the mechanisms of MR action in the communication between systemic inflammation and CNS regulation of the blood pressure and systemic end-organ pathology.

NIH COBRE (CPN); "Mineralocorticoid receptors: a link between chronic depression and hypertension?"
PI 6/12-6/13
The goal was to explore common pathogenic mechanisms for chronic depression and hypertension. While portions of these goals could not be attained, important insight into the roles of the MR and GR within the PVN that had been controversial were elucidated.

1R21HL105383-01A1, NHLBI; "Regulation of the late-pathway of aldosterone biosynthesis" 4/11- 3/14
PI: Celso E. Gomez-Sanchez; Co-I: Elise P. Gomez-Sanchez: role: joint design of all experiments, all animal work, joint manuscript preparations
The goal is to investigate the mechanism by which DOC is transported into the mitochondria for its metabolism into aldosterone. We have shown that this is a regulated process and will isolate the factor (s) responsible for the regulated transfer.

1. **Gomez-Sanchez EP 2014 Brain mineralocorticoid receptors in cognition and cardiovascular homeostasis. Steroids 91C:20-31**
2. **Gomez-Sanchez E, Gomez-Sanchez CE 2014 The multifaceted mineralocorticoid receptor. Comprehensive Physiology 4:965-994**
3. **Gomez-Sanchez EP 1986 Intracerebroventricular infusion of aldosterone induces hypertension in rats. Endocrinology 118:819-823**
4. **Gomez-Sanchez EP, Fort CM, Gomez-Sanchez CE 1990 Intracerebroventricular infusions of RU28318 blocks aldosterone-salt hypertension. Am J Physiol 258:E482-E484**
5. **Gomez-Sanchez EP, Fort C, Thwaites D 1992 Central mineralocorticoid receptor antagonism blocks hypertension in Dahl S/JR rats. Am J Physiol 262:E96-E99**
6. **Gomez-Sanchez EP, Gomez-Sanchez CE 1994 Effect of central amiloride infusion on mineralocorticoid hypertension. Am J Physiol 267:E754-E758**
7. **Gomez-Sanchez EP, Gomez-Sanchez CE 1995 The effect of the central infusion of benzamil on Dahl S rat hypertension. Am J Physiol 269:H1044-H1047**
8. **Gomez-Sanchez EP 1995 Mineralocorticoid modulation of central control of blood pressure. Steroids 60:69-72**
9. **Gomez-Sanchez EP, Gomez-Sanchez CE 1992 Central Hypertensinogenic effects of glycyrrhizic acid and carbenoxolone. Am J Physiol 263:E1125-E1130**
10. **Gomez-Sanchez EP, Ganjam V, Chen YJ, Liu Y, Clark SA, Gomez-Sanchez CE 2001 The 11beta hydroxysteroid dehydrogenase 2 exists as an inactive dimer. Steroids 66:845-848.**
11. **Gomez-Sanchez CE, de Rodriguez AF, Romero DG, Estess J, Warden MP, Gomez-Sanchez MT, Gomez-Sanchez EP 2006 Development of a panel of monoclonal antibodies against the mineralocorticoid receptor. Endocrinology 147:1343-1348**
12. **Gomez-Sanchez CE, Warden M, Gomez-Sanchez MT, Hou X, Gomez-Sanchez EP 2011 Diverse immunostaining patterns of mineralocorticoid receptor monoclonal antibodies. Steroids 76:1541-1545**
13. **Chen J, Gomez-Sanchez CE, Penman A, May PJ, Gomez-Sanchez E 2014 Expression of mineralocorticoid and glucocorticoid receptors in preautonomic neurons of the rat paraventricular nucleus. Am J Physiol Regul Integr Comp Physiol 306:R328-340**
14. **Gomez-Sanchez CE, Zhou MY, Cozza EN, Morita H, Eddleman FC, Gomez-Sanchez EP 1996 Corticosteroid synthesis in the central nervous system. Endocr Res 22:463-470**

15. Gomez-Sanchez CE, Zhou MY, Cozza EN, Morita H, Foecking MF, Gomez-Sanchez EP 1997 Aldosterone biosynthesis in the rat brain. Endocrinology 138:3369-3373
16. Yu L, Romero DG, Gomez-Sanchez CE, Gomez-Sanchez EP 2002 Steroidogenic enzyme gene expression in the human brain. Mol Cell Endocrinol 190:9-17
17. Gomez-Sanchez EP, Ahmad N, Romero DG, Gomez-Sanchez CE 2005 Is aldosterone synthesized within the rat brain? Am J Physiol Endocrinol Metab 288:E342-346
18. Gomez-Sanchez EP, Gomez-Sanchez CM, Plonczynski M, Gomez-Sanchez CE 2010 Aldosterone synthesis in the brain contributes to Dahl salt-sensitive rat hypertension. Exp Physiol 95:120-130
19. Gomez-Sanchez CE, Qi X, Velarde-Miranda C, Plonczynski MW, Parker CR, Rainey W, Satoh F, Maekawa T, Nakamura Y, Sasano H, Gomez-Sanchez EP 2014 Development of monoclonal antibodies against human CYP11B1 and CYP11B2. Mol Cell Endocrinol 383:111-117
20. Nakamura Y, Maekawa T, Felizola SJ, Satoh F, Qi X, Velarde-Miranda C, Plonczynski MW, Ise K, Kikuchi K, Rainey WE, Gomez-Sanchez EP, Gomez-Sanchez CE, Sasano H 2014 Adrenal CYP11B1/2 expression in primary aldosteronism: Immunohistochemical analysis using novel monoclonal antibodies. Mol Cell Endocrinol 392:73-79