#### CURRICULUM VITAE

## **Colin Sumners, PhD**

Professor Emeritus

Department of Physiology & Functional Genomics

University of Florida

**ORCID iD**

<https://orcid.org/0000-0002-9689-2255>

**PERSONAL & EDUCATION**

Birthplace: London, England

Citizenship: Naturalized U.S. Citizen (1989)

BSc in Physiology & Biochemistry University of Southampton, UK, 1976

PhD in Physiology & Pharmacology University of Southampton, UK, 1979

**ACADEMIC APPOINTMENTS**

* Professor Emeritus, Department of Physiology and Functional Genomics, University of Florida College of Medicine, Gainesville, FL (12/2021)
* Adjunct Professor, Department of Physiology and Functional Genomics, University of Florida College of Medicine, Gainesville, FL (10/2018 – 11/30/2021)
* Professor, Department of Physiology and Functional Genomics, University of Florida College of Medicine, Gainesville, FL (09/1992 – 09/2017)
* Associate Professor (with tenure), Department of Physiology, University of Florida, Gainesville, FL (09/1987 - 09/1992)
* Assistant Professor, Department of Physiology, University of Florida, Gainesville, FL (09/1982 - 09/1987)
* Postdoctoral Associate, Department of Physiology, University of Florida, Gainesville, FL. *Mentor: Prof. M. I. Phillips* (01/1981 - 08/1982)
* Postdoctoral Fellow, Department of Pharmacy, University of Groningen, Holland. *Mentor: Prof. A.S. Horn* (12/1979 - 12/1980)

**ADMINISTRATIVE APPOINTMENTS**

* Program Director, Junior Honors/Medical Honors Program, College of Medicine, University of Florida (09/2005 - 07/2017)
* Program Director, Medical Student Research Program, College of Medicine, University of Florida (01/1999 - 01/2010)
* Associate Dean for Graduate Education, College of Medicine, University of Florida (01/99 - 09/01)
* Vice Chair, Department of Physiology, University of Florida, Gainesville, FL (07/95 - 01/99)

**ACADEMIC HONORS & AWARDS**

***University of Florida:***

* University of Florida College of Medicine Lifetime Achievement Award (2017)

[https://facultycouncil.med.ufl.edu/faculty-information/lifetime-achievement-award/]

* University of Florida Research Foundation (UFRF) Professorships (2002-2005 & 2012-2015)
* University of Florida, College of Medicine, Exemplary Teacher, Five Year Award (2011)
* Three-time University of Florida, College of Medicine, Basic Science Teacher of the Year (2003-2004; 2005-2006; 2008-2009)
* Alpha Omega Alpha Honor Medical Society, Beta Chapter, University of Florida (2006 - present)
* Five-time University of Florida, College of Medicine, Exemplary Teacher Award (2003, 2006, 2007, 2008, 2009, 2010)
* University of Florida Teacher-Scholar of the Year/U.F. Presidential Medal (1996-1997) [http://aa.ufl.edu/awards/uf-internal-awards/teacher--scholar-of-the-year/]
* University of Florida President's Research Achievement Award, (1989-1990)

***National & International:***

* Fellow of the American Heart Association - Council for Hypertension (2013 - present)
* National Institutes of Health (NINDS), Javits Neuroscience Investigator MERIT Award, (1992-1999)
* Gordon Research Conference on Angiotensin, Steering Committee (1995 - 1999)
* Royal Society (London) European Program Postdoctoral Fellowship, (1979-1980)

**PROFESSIONAL AFFILIATIONS**

* International Society for Hypertension (2015 - present)
* American Heart Association Council for Hypertension (2002 - present)
* American Heart Association (2002-present; Gold Heart member)
* American Physiological Society (1985 - present)

**Professional EXPERIENCE**

My entire 35-year academic career as a full-time faculty member (September 1982 – August 2017) was spent at the Department of Physiology & Functional Genomics, University of Florida College of Medicine, in Gainesville, Florida. For the entirety of that time, I was fully engaged in the three major facets of an academic position, research, teaching and service.

I retired from my full-time faculty position on August 31, 2017. Following a 6 month “stay-away” period (September 2017 - February 2018) as mandated by the FRS DROP Program, I was given a Courtesy appointment in Physiology & Functional Genomics in March 2018. I was re-hired as an Adjunct Professor in the same Department in October 2018. Since then, I have worked part-time as MPI on one NIH R01, including advising postdocs and students, the latter as a member of the Graduate Faculty. I have also continued to serve as a reviewer for NIH and for scientific journals.

**1:** **Research Activities**

Since the start of my research training as an undergraduate in 1978, the major focus of my work has been on the peptide angiotensin II (Ang II) and its functional effects mediated by type 1 (AT1) and type 2 (AT2) receptors in the brain, in particular its cardiovascular actions in health and disease. I received continuous R01 support as P.I. for this work from NIH (NHLBI or NINDS) since 1984, including an NINDS Jacob Javits Neuroscience Investigator MERIT award (1992-1999), and have also received several awards from the American Heart Association. These research efforts have yielded >250 publications and book chapters, the majority of which involve studies on one or more aspects of the renin-angiotensin system (RAS). My current interests encompass two major areas: (i) A long standing effort on understanding the CNS mechanisms involved in the neural control of blood pressure, and how these mechanisms go awry in and contribute to neurogenic hypertension. Currently, this area primarily involves studies on AT2R, and this is the subject of our presently funded NIH R01 grant; (ii) Studies which investigate the potential beneficial actions of angiotensin peptides and AT2R agonist drugs in ischemic stroke, with a view to uncovering novel therapeutic avenues. Major research achievements have been:

* Definition of the cellular locations, signaling actions, and regulation of Ang II receptors in cardiovascular control centers of the brain, under normal and hypertensive conditions.
* Providing the first demonstration of *any* functional effect of AT2R in mammals, specifically on neuronal K+ currents and activity; this was followed by studies which demonstrated the domains of the AT2R that were important in these AT2R actions.
* Discovery of the downstream intracellular signaling events that are linked to AT2R functions in neurons, such as activation of protein phosphatases, and inhibition of Erk MAP kinases, actions that have been shown to be true for AT2R in other non-neuronal tissues and cells.
* Made significant advances in identifying anti-hypertensive factors. For example, using Adenoviral and AAV-based vectors that we developed to deliver genes to neurons, we demonstrated significant inhibitory actions of macrophage migration inhibitory factor in brain cardiovascular control centers on Ang II/AT1R-induced increases in blood pressure and on hypertension. Further, we utilized Adenoviral and AAV-based vectors to deliver AT2R to cardiovascular control centers of the brain, allowing us to demonstrate anti-hypertensive actions of these receptors.
* Made significant contributions to the idea that components of the protective renin-angiotensin system (ACE2/Ang 1-7/Mas, and Ang II/AT2R) can exert beneficial effects in stroke. Our studies pioneered the idea that Ang-(1-7)/Mas exert neuroprotective effects in both ischemic and hemorrhagic stroke. We were the first to show that *systemic* post stroke application of either an ACE2 activator or an AT2R agonist is protective. We believe that these studies have laid the basic groundwork for considering Mas and AT2R as future clinical targets for stroke.

**RESEARCH FUNDING**

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| --- | --- | --- |
| **CURRENT GRANT** | **YEARS** | **DIRECT COSTS** |
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| NIH/NHLBI, R01 HL136595-01A1. “Neurons expressing angiotensin type 2 receptors in the NTS as an access point for cardiovascular control.” MPIs: Eric Krause (20%) effort; **Colin Sumners** (20% effort; since 10/18); Co-I Annette De Kloet (15% effort). NCE Year.**PENDING GRANT**NIH/NHLBI, R01 HL136595-06**. “**Angiotensin-sensitive neurons in the nucleus of the solitary tract mediate socialstress induced hypertension”. MPIs: Annette de Kloet (20%) effort; **Colin Sumners** (20% effort). Received 20 Impact Score, 3.0 Percentile.**COMPLETED GRANTS (including Fellowships)***NATIONAL INSTITUTE OF HEALTH (NIH)* NIH/NHLBI, R01 HL33610-28. “Angiotensin and Neuroimmune activation in hypertension.” MPIs: Mohan Raizada (20%) effort; **Colin Sumners** (20% effort)NIH/NHLBI, 1K99 HL125805 “Novel role of AT2R in blood pressure regulation” PI: Annette de Kloet. Sponsor for K99 portion, **Colin Sumners**NIH/NINDS, 1F31NS086435-01A1 “Neuroprotection by Post-stroke Activation of the ACE2-Ang-(1-7)-Mas Axis”. PI: Douglas M. Bennion. Sponsor: **Colin Sumners**NIH/NHLBI, R01 HL076803 “MIF: A novel CNS Regulator of Cardiovascular Function”. PI: **Colin Sumners** (35% effort). NIH/NHLBI, R01 HL093186 “Paraventricular nucleus regulatory mechanisms in stress and hypertension”. MPIs: **Colin Sumners** (25% effort); Deborah Scheuer(25% effort)NIH/NHLBI, R01 HL076807 “Glucocorticoids, Stress and blood pressure regulation”. PI: D. A. Scheuer; Co-I: **Colin Sumners** (5% effort)NIH/NHLBI, 1F32 HL 116074. **“**Angiotensin-II, Hypothalamic Inflammation and Neurogenic Hypertension”. NRSA Postdoctoral Fellowship. PI: Annette de Kloet; Sponsor: **Colin Sumners.** NIH/NHLBI, R37 HL33610. “Brain angiotensin in hypertensive neurons in culture.” PI: M.K. Raizada; Co-I: **Colin Sumners** (25% effort)NIH/NINDS, F30 NS060335-01. “Cerebroprotection via viral-mediated gene delivery of angiotensin AT2 receptors”. MD/PhD student Fellowship. PI: Adam Mecca; Sponsor: **Colin Sumners**NIH, R01 HD 033053-10 “Fetal Cardiovascular and Endocrine Reflex Responses” PI: C.E. Wood; Co-I: **Colin Sumners** (5% effort).NIH/NHLBI, R01 HL076803 “MIF: A novel CNS Regulator of Cardiovascular Function”. PI: **Colin Sumners** (35% effort). Co-Is: M.K. Raizada (15% effort); Glenn Toney (10% effort).NIH/NHLBI, 5T35 HL07489. “Short-term Training: Students in Health Professional Schools.” PI: **Colin Sumners** (10% effort)\*\* *Transferred to Greg Schultz on 01/01/10*NIH/NHLBI R01 HL 081577 “NKx2.5-depdendent Pathways in postnatal cardiomyocytes”. PI: H. Kasahara. Co-I: **Colin** **Sumners** (5% effort)NIH/NHLBI, R01 HL68085. “AT2 Receptors in Cardiovascular Control” PI: **Colin Sumners** (25% effort) Co-PI: Mohan K. Raizada (25% effort)NIH/NHLBI, 5T35 HL07489-22A1. “Short-term Training: Students in Health Professional Schools.” PI: **Colin Sumners** (10% effort)NIH/NIDDK, R01 DK38114. “Control of corticotropin during pregnancy”. PI: M. Keller-Wood. Co-I: **Colin Sumners** (10% effort).NIH/NIA, P01 AG 10485. “Discovery of novel drugs for Alzheimer's disease.” Program Director: E. Meyer; Director of a Tissue Culture Core (Core B): Colin Sumners (5% effort)NIMH, F31 MH12502. “Angiotensin II Stimulated Neuronal Fos and Jun Kinase” Predoctoral NRSA, PI: Melissa Fleegal; Sponsor: **Colin Sumners**NIH/NHLBI, R01 HL49130. "Angiotensin II: neuronal ion channel signaling pathways." PI: Colin Sumners (25% effort).NIH/NHLBI, 5T35 HL07489. “Short-term Training: Students in Health Professional Schools.” PI: **Colin Sumners** (10% effort)NIH/NINDS, R01 NS19441. Javits Neuroscience Investigator MERIT Award "Catecholamine/angiotensin II interactions in the brain". PI: **Colin Sumners** (30% effort). Co-I: M.K. Raizada (15% effort).NIH/NIA, P01 AG10485. “Discovery of novel drugs for Alzheimers Disease.” PI: J.W. Simpkins. Director of a Tissue Culture Core (Core B): **Colin Sumners**, (5% effort).NIH/NHLBI, R01 HL33610. “Brain angiotensin in hypertensive rat neurons in culture.” PI: M.K. Raizada (30% effort); Co-I: **Colin Sumners** (15% effort).NIH/NHLBI, R01 HL49130. “Angiotensin II induced neuronal currents in hypertension.” PI: **Colin Sumners** (20% effort); Co-PI: P. Posner (20% effort).NIH/NINDS, R01 NS19441. “Research Supplement for Underrepresented Minorities” for Waltke R. Paulding.NIH/NICHD, R01 HD24250. “Control of corticotropin in the fetus.” PI: Charles Wood (25% effort); Co-I: **Colin Sumners** (5% effort).NIH/NINDS, R01 NS19441. “Catecholamine-angiotensin II interactions in the brain.” Supplemental funding. PI: **Colin Sumners** (30% effort); Co-I: M.K. Raizada (15% effort) and F.T. Crews (10% effort).NIH/NIAAA, R01 AA06069. “Ethanol effects on neurotransmission.” PI: F.T. Crews (25% effort); Co-PI: **Colin Sumners** (10% effort). Dr. Sumners' involvement ended on 1/1/95 when Dr. Crews moved to UNC, Chapel Hill.NIH/NHLBI. R01 HL39154, “Physiologic response to chronic cold exposure.” PI: M.J. Fregly (15% effort); Co-PI: **Colin Sumners** (15% effort).NIH/NHLBI, R01 HL33610. “Brain angiotensin in hypertensive rat neurons in culture.” PI: M.K. Raizada. Co-I: **Colin Sumners** (10% effort), Stephen P. Baker, and M.I. Phillips.NIH/NHLBI, R01 HL39154. “Physiologic responses to chronic cold exposure.” PI: M.J. Fregly (15%); Co-PI: **Colin Sumners** (15% effort).NIH/NHLBI, R01 HL36645. “Functional regulation of brain angiotensin.” PI: **Colin Sumners** (20% effort); Co-PI: M.J. Fregly (15% effort).NIH/NINCDS, R01 NS19441. “Catecholamine/angiotensin II interactions in the brain.” PI: **Colin Sumners** (30% effort); Co-I: M.K. Raizada (20% effort), F.T. Crews (10% effort), and M.I. Phillips (5% effort).NIH/NHLBI, R01 HL33610. “Brain angiotensin in hypertensive rat neurons in culture.” PI: M.K. Raizada; Co-I: **Colin Sumners** (30% effort) and M.I. Phillips.NIH/NINCDS, R01 NS19441. “Catecholamine-angiotensin II interactions in the brain.” PI: **Colin Sumners** (30% effort); Co-I: M.K. Raizada (15% effort) and F.T. Crews (10% effort).*AMERICAN HEART ASSOCIATION*American Heart Association, 12PRE11940010. “Translational approaches for delivery of novel activators of the cerebroprotective ACE2/Ang-(1-7)/Mas system in stroke”. PI: Douglas Bennion; Sponsor: **Colin Sumners.** American Heart Association, 12POST11550013. **“**Angiotensin-II, Hypothalamic Inflammation and Neurogenic Hypertension”. PI: Annette de Kloet; Sponsor: **Colin Sumners.**American Heart Association -Greater Southeast 09POST2230164. “The role of pro- and anti-inflammatory cytokines in the PVN in angiotensin II-induced hypertension”. Postdoctoral Fellowship. PI: Peng Shi; Sponsor: **Colin Sumners** American Heart Association -Greater Southeast 09GRNT2060421 “Angiotensin (1-7) induced cerebroprotection” PI: **Colin Sumners** (10% effort)American Heart Association -FL, #0715396B Medical Student Summer Research. PI: **Colin Sumners** (5% effort)American Heart Association -FL, #0515148B “Macrophage Migration Inhibitory Factor: Expression in hypertensive rat neurons”. Graduate Student Fellowship. PI: R. Harrison. Sponsor: **Colin Sumners** (5% effort).American Heart Association -FL, #0515074B Health Science Student Summer Research. PI: Colin Sumners (5% effort)American Heart Association, FL Affiliate, #0425377B. “Macrophage Migration Inhibitory Factor: A novel regulator of the neuronal actions of angiotensin II.” Postdoctoral Fellowship, PI: Tomokazu Matsuura; Sponsor: **Colin Sumners**.American Heart Association, FL Affiliate, #0325232B. “Transduction of functional domains of the AT1 receptor in vivo.” Postdoctoral Fellowship, PI: Jorge Vazquez; Sponsor: **Colin Sumners**.American Heart Association, FL Affiliate, #0315168B. “Health Sciences Student Summer Research.” PI: **Colin Sumners** (10% effort)American Heart Association, National Center. “Neuroprotective effects of amino acids in stroke”. Student Scholarship in Cardiovascular Disease and Stroke. PI: Brandy Roose; Sponsor: **Colin Sumners**American Heart Association, FL affiliate, #0110048B. “Medical Student Research Fellowships.” PI: **Colin Sumners** (10% effort)American Heart Association, FL Affiliate, # 0051035B. Grant-in-Aid. “Angiotensin II-induced Phosphorylation of Neuronal Potassium Channels” PI: **Colin Sumners** (15% effort)American Heart Association, Florida Affiliate, # 9910056. “Medical Student Summer Research.” PI: **Colin Sumners** (5 %effort)American Heart Association, FL Affiliate, # 9920557. “Role of Angiotensin AT2 Receptor in Cardiovascular Function.” Postdoctoral Fellowship, PI: Stephan Gallinat; Sponsor: **Colin Sumners**.American Heart Association, FL Affiliate, # 9910045. “Angiotensin II stimulated Fos and Jun kinase signaling pathways in neurons: Role in norepinephrine synthesis.” Predoctoral Fellowship; PI: Melissa Fleegal; Sponsor: **Colin Sumners**.American Heart Association, FL Affiliate. Postdoctoral Fellowship; PI: John D. Warth.Sponsor: **Colin Sumners**.American Heart Association, FL Affiliate. Postdoctoral Fellowship; PI: U. V. Shenoy.Sponsor: **Colin Sumners**.American Heart Association-FL Affiliate. Predoctoral Fellowship; PI: Michael A. Reutter. Sponsor: **Colin Sumners**.American Heart Association - FL Affiliate, Grant-in-Aid. “Electrophysiological effects of angiotensin II in cultured neurons mediated by the AT1 receptor.” PI: P. Posner (30% effort); Co-I **Colin Sumners** (5% effort).American Heart Association - FL Affiliate. Postdoctoral Fellowship; PI: Jian Kang.Sponsor: **Colin Sumners**.American Heart Association - Florida Affiliate. “Mineralocorticoid regulation of brain angiotensin function.” PI: **Colin Sumners** (15% effort); Co-I: M.J. Fregly. Funds transferred to M.J. Fregly by Colin Sumners, effective 4/1/87. | 12/01/17-11/30/2212/01/22-11/30/2607/01/13-08/31/1712/01/14-11/30/1601/10/1504/01/11-03/31/1608/01/09-06/30/1507/01/11-06/30/1502/01/13-12/01/1407/01/03-06/30/1307/01/08-06/30/1212/01/06-11/30/1107/01/05-03/31/1109/01/07-08/31/1207/01/05- 06/30/1009/01/01-08/31/0704/01/02-03/31/0712/01/02-01/31/0708/01/99 -07/31/0408/01/00 - 07/31/0310/01/97 - 09/30/0205/01/00 -04/30/0107/01/92 - 06/30/0008/01/96 - 07/31/9907/01/94 - 06/30/9804/01/94 - 03/31/9703/01/93 - 02/28/9507/01/92 - 06/30/9504/01/92 - 06/30/9204/01/92 - 03/31/9707/01/90 - 06/30/9412/01/88 - 11/30/9307/01/87 - 06/30/9007/01/87 - 06/30/9004/01/87 -03/31/9210/01/84- 09/30/8704/01/84- 03/31/8707/01/12-06/30/1407/01/12-02/01/1307/01/09-06/30/1107/01/09-06/30/1107/01/07-06/30/0907/01/05-06/30/0707/01/05-06/30/0707/01/04-06/30/0607/01/03-06/30/0507/01/03-06/30/0507/01/02-06/30/0307/01/01-06/30/0307/01/00 - 06/30/0207/01/99 -06/30/0107/01/99-06/30/0107/01/99-06/30/0007/01/97 - 06/30/9907/01/96 - 06/30/9807/01/94 - 06/30/9607/01/93 - 03/31/9407/01/92 - 06/30/9407/01/86- 06/30/88 |  $1,939,115  $1,640,200   $2,500,000 $224,506  $1\* *Funding*  *Declined by*  *Bennion* $1,000,000$1,250,000$811,960$91,364$2,227,000$140,350$1,250,000$1,954,954$561,870$1,250,000$1,575,270$372,600$1,250,000$441,410$63,897$734,306$91,058$1,052,327$630,000$584,000$383,395$41,400$267,748$19,700$847,440$475,390$760,376$385,538$315,629$678,345$253,716$191,221$88,772$90,000$88,000$165,000$31,800$21,000$10,800$93,500$80,000$21,600$2,000$21,600$119,906$21,600$68,000$29,000$69,000$69,000$29,000$30,000$65,000$55,299 |
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**INTELLECTUAL PROPERTY/PATENTS**

* U.S Patent No. 6,620,850 for “Materials and methods for Treatment of neurological disorders

Involving over activation of glutamatergic ionotropic receptors”. A. Martynyuk, A. Glushakov,

D. Dennis, **C. Sumners** and M.I. Phillips (September 16, 2003).

* International Patent No. WO/2006/020171 for “Methods and Materials for Treating Mental

Illness”. A. Martynyuk, D. Dennis, N. Gravenstein, A. Glushakov, V. Yarotskky, **C. Sumners**,

C. Seubert (February 23, 2006).

* U.S. Provisional Patent Application No. 62/341,362. “Use of angiotensin II receptor agonists

in the treatment and prevention of stroke”. **C. Sumners**, D. Bennion, U. M. Steckelings. (May

25, 2016)

* International Patent Application No. WO/2017/205610. “Use of angiotensin II receptor agonists

in the treatment and prevention of stroke”. **C. Sumners**, D. Bennion, U. M. Steckelings. (November 30, 2017)

**SYMPOSIA/SESSIONS ORGANIZED**

* Developed and Chaired a Symposium on “Novel Targets for Neuroprotection in Stroke”, at the AHA International Stroke Conference, Honolulu, Hawaii, February 2019.
* Developed and Co-Chaired with Erin Bruce a Symposium titled “Angiotensin Type 2 Receptors in the Brain: A Functional Coming-of-Age in Cardiovascular Control”, at the EB2015 Meeting in Boston, MA, April 2015.
* Co-Organized (with M. Hay, Univ. of Missouri) a symposium entitled “AT1 and AT2 receptors: antagonists in cellular action”, for the 2003 EB Meeting in San Diego, CA.
* Organized and Chaired a session entitled “CNS actions of angiotensin II” at the Gordon Research Conference on Angiotensin, held in Oxford, U.K., during August 1999.
* Organized and Chaired a session entitled “AT2 receptors: novel aspects” at the Gordon Research Conference on Angiotensin, held in Ventura, CA, during February 1996.
* Organized an International Symposium on the Cellular and Molecular Aspects of Angiotensin Receptors, 12/9-12/11/94, Gainesville, FL. 85 attendees. (Co-organizers, M.K. Raizada and M.I. Phillips).

**INVITED LECTURES/PRESENTATIONS**

* Angiotensin Gordon Conference, Ventura, CA (November 2022, accepted invitation).
* 25th European Council for Cardiovascular Research (September 2022, accepted invitation)
* Inter-American Congress of Cardiovascular Prevention, Virtual (November 2021)
* XIIIth International meeting on Vasoactive Peptides, Virtual (October 2021).
* Experimental Biology 2021 Meeting, Virtual, Symposium titled “The Protective Arm of the Renin-Angiotensin System” (April 2021)
* University of Southern Denmark, Institute of Molecular Medicine, Virtual (February 2021)
* ISH-ESH 2020 Meeting, Glasgow, Scotland (Oral Abstract; May 2020; Meeting cancelled due to Covid-19)
* Renin Angiotensin Aldosterone System International Congress of Endocrinology satellite meeting 2018, Stellenbosch, South Africa (December 2018).
* Premium Hypertension Conference, Japanese Hypertension Society, Tokyo, Japan (July 2018).
* Barrow Neurological Institute, Phoenix, Arizona (March 2018).
* European Council for Cardiovascular Research, Garda, Italy (August 2017).
* European Society for Hypertension, Milan, Italy (June 2017).
* AHA International Stroke Conference, Houston (February 2017). Abstract accepted for moderated poster oral presentation.
* American Heart Association, Annual Sessions, RAAS Symposium, New Orleans, LA (November 2016).
* International Society for Hypertension, Seoul, Korea (September 2016). Abstract accepted for oral presentation.
* Southern Medical University, Guangzhou, China (September 2016).
* University of Montreal, Department of Pharmacology, Canada (March 2016).
* Angiotensin Gordon Conference, Il Ciocco, Tuscany, Italy (February 2016).
* Department of Physiology and Pathology, UNESP, Araraquara, Brazil (November 2015).
* Xth International meeting on Vasoactive Peptides, Lagoa dos Ingleses, Minas Gerais, Brazil (October 2015).
* Vicore Pharma, Gothenburg, Sweden (September 2015).
* International Society for Autonomic Neuroscience, 2015, Stresa, Italy (September 2015).
* Brazilian Physiological Society, SBFis, Aguas De Lindoia, Sao Paulo State, Brazil (August 2015)
* Experimental Biology Meeting, Boston, MA (April 2015), Symposium on "AT2R and cardiovascular control". Chair
* Institute of Molecular Medicine, University of Southern Denmark, Odense (March 2015).
* Vicore Pharma, Gothenburg, Sweden (February 2015).
* Renin Angiotensin Aldosterone System, World Congress of Pharmacology satellite meeting 2014, Cape Town, South Africa (July 2014).
* Angiotensin AT2 receptor agonists in Health and Disease Symposium, Lucca, Italy (February 2014).
* Department of Physiology and Pathology, UNESP, Araraquara, Brazil (December 2013).
* International Union of Physiological Sciences, Symposium on “Recent Advances in Renin-Angiotensin System and Implications in Health and Disease”, Birmingham, UK (July 2013).
* IXth International meeting on Vasoactive Peptides, Belo Horizonte, Brazil (May 2013).
* Pre-International Society for Hypertension Satellite Meeting, “Evolving Concepts of the RAS”, Hunter Valley, Australia (September 2012).
* Experimental Biology Meeting, San Diego, CA (April 2012), Symposium on "Angiotensin II and sympathetic regulation".
* Angiotensin Gordon Conference, Ventura, CA (February 2012).
* ISAN-AAS 2011 Satellite Symposium on “Body-Fluid Homeostasis: Transduction and Integration”, Araraquara, Brazil (September 2011).
* Nova Southeastern University (January 2011).
* UNESP, Department of Physiology, Araraquara, Brazil (August 2010).
* Bristol II Symposium on the Paraventricular Nucleus in health and disease, Bristol, England, (July 2009).
* The Physiological Society Symposium on Neurovascular Inflammation and Neurogenic hypertension, Dublin, Ireland (July 2009).
* XIII Symposium of Cardiovascular Physiology, Ouro Preto, MG, Brazil (February 2009)
* APS Summer Research Conference on Neural Control of Circulation, Bondi Beach, Australia (July 2007)
* Department of Biological Sciences, Mississippi State University (August 2006)
* Department of Biomedical Sciences, Florida State University (May 2006)
* European Physiological Society, Munich (March 2006)
* Department of Biomedical Sciences, Florida State University (Visiting Professor, January 2005)
* Angiotensin Gordon Conference, Ventura, CA (February 2004)
* Western Pharmacological Society, Lake Tahoe, Nevada (February 2003)
* Department of Biomedical Sciences, Florida State University (May 2002)
* Department of Pharmacology, University of Arkansas for Medical Sciences (April 2002)
* Experimental Biology Meeting, Orlando, FL (March 2001)
* Angiotensin Gordon Conference, Ventura, CA (March 2001)
* Cayman Peptide Conference, Nassau, Bahamas (November 2000)
* Department of Physiology, Kingston University, Ontario, Canada (December 1999)
* Department of Physiology and Endocrinology, Medical College of Georgia, Augusta (November 1998)
* Consortium on Southeastern Hypertension Control, Atlanta, GA (September 1998)
* Department of Physiology, West Virginia University (June 1998)
* Angiotensin Gordon Conference, Ventura, CA (February 1998)
* Department of Physiology, University of Texas Health Science Center San Antonio (February 1998)
* Division of Nephrology, University of Florida (December 1997)
* Department of Oral Biology, University of Florida (September 1997)
* Department of Pharmacology, University of Virginia (January 1997)
* Department of Neuroscience, University of Florida (November 1996)
* Workshop on Recent Advances in AT2 Receptors, New York Hilton, NYC (May 1996)
* Department of Pharmacology, University of South Alabama (April 1996)
* Department of Pharmacodynamics, University of Florida (February 1996)
* Angiotensin Gordon Conference, Ventura, CA (February 1996)
* Angiotensin Gordon Conference, Il Ciocco, Barga, Italy (May 1995)
* Division of Nephrology, University of Florida (March 1995)
* Department of Pharmacology, University of South Alabama, Distinguished Scientist Seminar Series (October 1994)
* Department of Pharmacology, University of Florida, (November 1993)
* Third Annual Hypertension Investigators Meeting, Amelia Island, FL (April 1999)
* Department of Physiological Sciences, University of Florida (March 1993)
* Hypertension Program, University of Alabama at Birmingham, Birmingham, AL (December 1992)
* Parke-Davis, Department of Signal Transduction, Ypsilanti, MI (July 1992), symposium on Biochemical and Physiological Functions of AT2 receptors
* Angiotensin Gordon Conference, Oxnard, CA (February 1992)
* New York Academy of Sciences, New York City, NY (April 1991)
* Dupont Company, Wilmington, DE (February 1991)
* Department of Pharmacodynamics, University of Florida (March 1990)
* Angiotensin Gordon Conference, Oxnard, CA (February 1989)
* Department of Neuroscience, University of Florida (December 1988)
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**PUBLICATIONS**

*PEER-REVIEWED PAPERS & REVIEWS*

**Google Scholar Citation Indices: h-index (66); i10 index (236)**

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255. U. M. Steckelings, R. E. Widdop, E. Sturrock, L. Lubbe, T. Hussain, E. Kaschina, T. Unger, A. Hallberg, R. M. Carey, and **C. Sumners**. The angiotensin AT2 receptor: from a binding site to a novel therapeutic target. *Pharmacol. Rev.* 2022; 74 (4):1051-1135

*BOOKS*

1. Cellular and Molecular Biology of the Renin-Angiotensin System, M.K. Raizada, M.I. Phillips, and **C. Sumners** (Eds.). Boca Raton, FL: CRC Press, 1993, 578 pages.
2. “Recent Advances in Angiotensin Receptors”, (Advances in Experimental Medicine and Biology, Vol. 396) M.K. Raizada, M.I. Phillips, and **C. Sumners**, (Eds.). New York: Plenum Press, 1996, 270 pages.

*BOOK CHAPTERS*

1. G.N. Woodruff and C. Sumners. Structure activity and conformational requirements for dopaminergic agonists: Comparison of central and peripheral dopamine receptors. In: Peripheral Dopamine Receptors, J. Imbs and J.C. Schwartz (Eds.). *Adv. Biosci*., 20 (1979): 57-70.
2. C. Sumners and M.J. Fregly. Receptors for Angiotensin II. In: Peptide hormone receptors, M.Y. Kalimi, J.R. Hubbard (Eds.). Berlin and New York: W. de Gruyter, (1987): 664-713.
3. E.M. Richards, M.K. Raizada, and C. Sumners. Insulin downregulates alpha2-adrenergic receptors in cultured glial cells. In: Insulin, insulin-like growth factors and their receptors in the CNS, M.K. Raizada, M.I. Phillips, D. Le Roith (Eds.). New York: Plenum Press, (1987): 209-214.
4. F.T. Crews, R. Raulli, J. Scott, C. Sumners, and M.K. Raizada. Adrener­gic stimulation of phosphoinositide hydrolysis: drug potency, efficacy and sensitivity changes. In: Progress in Catecholamine Research, Part B, Alan R. Liss, Inc., 1988, 383-387.
5. M. Adamo, M.K. Raizada, J. Shemer, A. Ota, C. Sumners, J. Olson, and D. LeRoith. Analysis of insulin and insulin-like growth factor 1 receptors in neuronal tissues. Protocols of Mol. Biolin *Methods in Mol. Biol* series, A. Longstaff (Ed.), Totowa, NY: Humana Press, 1992, 227-260.
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7. B. Rydzewski, M. Wozniak, C. Sumners, and M.K. Raizada. The plasminogen activator system and its interactions with angiotensin II in the brain. In: Cellular and Molecular Biology of the Renin-Angiotensin System, M.K. Raizada, M.I. Phillips and C. Sumners (Eds.). Boca Raton, FL: CRC Press, 1993, 485-512.
8. F.T. Crews, H. Newsom, M. Gerber, C. Sumners, L.J. Chandler, and G. Freund. Molecular mechanisms of alcohol neurotoxicity. In: Alcohol, Cell Membranes and Signal Transduction in the Brain, C. Alling and G. Sun (Eds.), New York: Plenum Press, 1993, 123-138.
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10. J. Evans, C. Sumners, and G.H. Gelband. Receptor Transduction Mechanisms. *Encyclopedia of Life Sciences.* (2000), online at <http://www.els.net/els/els/els/index.html>
11. C. Sumners and E.M. Richards. Angiotensin receptor signaling in the brain: ionic currents and neuronal activity. In: *“Handbook of Experimental Pharmacology”,* edited by T. Unger and B. Scholkens, Springer-Verlag (Berlin). (2004) 163 (II): 141-161.
12. D. M. Bennion, R.W. Regenhardt, A.P. Mecca and C. Sumners. Mas in neuroprotection in stroke. In: *Protective Arm of the Renin-Angiotensin System*; T. Unger, U.M. Steckelings and R.A. Santos, eds. Elsevier Press, 2015; pp. 201-204
13. V. Rodríguez, A. D. de Kloet and C. Sumners. Hypertension and brain Inflammation: Role of RAS induced glial activation. In: *Hypertension and brain as an end-organ target*; H. Girouard, ed. Springer, 2016 pp. 181-194.

**RESEARCH-RELATED SERVICE**

*EDITORIAL ACTIVITIES*

**Editorial Board:**

*Mol. Medicine (1992-96)*

*Am. J. Physiol. (Heart) (1994-96)*

**Journal Reviews:**

(Within the last 3 years) Clinical Science, Hypertension, Pharmacological Reviews, Cardiovascular Research, Nature Medicine, Stroke, Neural Regeneration Res.

*NIH & OTHER FEDERAL AGENCIES*

* NIH: From 1990 until 2020, I served as a reviewer for various NIH grant programs. R01 (NINDS), P01, K01, F31/32, R15 AREA T35 and R25 (all NHLBI). I was Chair of the T35 and R25 Study Sections for 3 years each.
* NIMH, Board of Scientific Directors’ Review of Intramural Programs (1999-2000)
* NIH, Roadmap Workshop on Clinical Research (2004).
* National Science Foundation (Behavioral and Neural Sciences Program; Reviewer) (1990 - 2000)
* Oak Ridge Associated Universities (ORAU) Performance Review (periodic; 2003-present).

*AMERICAN HEART ASSOCIATION*

I have been a long-term volunteer with the AHA, starting in 1988. My involvement with the AHA is listed below.

* AHA Excellence Award for Hypertension Research Selection Committee of the Council for Hypertension (2015-2017)
* AHA Scientific & Clinical Education Lifelong Learning (SCILL) Committee of the Council for Hypertension (2016-2018)
* AHA Fall Specialty Conference Planning Committee (2014-2018)
* AHA, SFRN Disparities in CVD & Stroke Oversight Committee (2015-2016)
* AHA, Strategically Focused Disparities Research Center Review Committee (2015)
* AHA Fall Conference Committee of the Council for Hypertension (2013-2016)
* AHA, Established Investigator Basic Science Study Section, Co-Chair (2011), Chair (2012 and 2013)
* AHA, Greater Southeast Affiliate, Molecular Signaling Study Section, Co-Chair (2007), Chair (2008-2010)
* AHA, National Center, Peer Review Steering Committee (2005-2009)
* AHA, National Center, Science Classification Task Force (2005)
* AHA, Southern/Ohio Valley Peer Review Consortium, Molecular Signaling Study Group, Co-Chair (2001, 2002), Chair (2003, 2004)
* AHA, National Center, Cardiovascular Regulation 1 Study Section, Member (1998), Co-Chair (1999), Chair (2000, 2001).
* AHA, National Center, Research Program and Evaluation Committee (1998 - 1999)
* AHA, Southern/Ohio Valley Peer Review Consortium Steering Committee, Chair (1997 - 1999)
* AHA, Florida Affiliate, Board of Directors (1996 -1998)
* AHA, Florida Affiliate.  Policy and Guidelines Review Task Force, Chair (1995, 1996)
* AHA, Florida Affiliate, Research Committee.  Member (1992 - 1994), Vice-Chair (1994 - 1996), Chair (1996 - 1998). *This committee oversaw the Affiliate Research Program at all levels – from setting policy, determining funding levels, to overseeing peer review.*
* AHA, National Center.  Affiliate Peer Review Group on Molecular Signaling. Chair (1994-1995).
* AHA, Southern Regional Peer Review Committee.  Member (1988 - 1992), Co-Chair (1992 - 1994).

**POSTDOCTORAL FELLOWS**

I have supervised 25 Postdoctoral Fellows. They have gone on to a variety of careers, including professional school (Medicine), Pharmaceutical industry, Regulatory Affairs, and Research Scientists. Those Fellows who have gone on to careers in academia (research and teaching) are:

Jian Kang, MD, PhD. Associate Professor of Cell Biology and Anatomy, NYMC, Valhalla, NY

Desuo Wang, PhD, MD, Associate Professor, Department of Pharmaceutical Sciences, Philadelphia College of Osteopathic Medicine, Philadelphia, PA

Chengwen Sun, MD, PhD, Associate Professor, Department of Pharmaceutical Sciences, North Dakota State University, Fargo, ND

Tomokazu Matsuura, MD, Chief Physician and Associate Professor, NHO Tokyo Medical Center, Department of Nephrology, Japan, and Keio University, Japan.

Hongwei Li, DVM, PhD, Professor, Southern Medical University, Guangzhou, China

Peng Shi, MD, PhD, Assistant Professor, School of Medicine, Hangzhou University, China

Annette De Kloet, PhD, Assistant Professor, Department of Physiology & Functional Genomics, University of Florida

****GRADUATE STUDENT SUPERVISION: (Committee Chair)**

**GRADUATE STUDENT SUPERVISION: (Committee Member)**

In addition to the above students, while at the University of Florida I served as a supervisory committee member for 6 MS students and another 68 PhD students.

**2:** **Educational Activities**

My experience in the classroom was stand-up lectures, small group teaching, and also team-based learning activities, as well as various administrative roles.

**EDUCATION ADMINISTRATION**

**Graduate Coordinator**, Department of 1988 - 1992

 Physiology, University of Florida

**Associate Dean for Graduate Education**, 1999 - 2001

College of Medicine, University of Florida

**Director, Medical Honors Program\*,** 2005 - 2017

College of Medicine, University of Florida

**\*** BA/MD early acceptance program for medical school, formerly Junior Honors Medical Program.

**CLASSROOM COURSES (Medical Students):**

Medical Physiology (BMS 6500), Endocrinology/Neuroscience. *Lecturer, 1983-2012; Course Director 1995 & 1996; Endocrine Section Head, 1984-1995, 2007-2009.*

Medical Pathophysiology (BMS 6501), Endocrinology. *Lecturer and Small Groups, 1983-1988.*

Medical Endocrinology & Reproductive Organ Systems (BMS 6632). *Lecturer, 2013-2017.*

**CLASSROOM COURSES (Graduate Students):**

Cell Physiology (GMS 6430). *Lectures, co-Course Director, 1982 and 1984.*

Principles of Medical Physiology (GMS 5400C), Endocrinology. *Lecturer 1983-1996; Course Director, 1995 & 1996.*

Catecholamine Physiology (GMS 6460). *All lectures, Course Director, 1988 & 1993.*

Advanced Endocrinology (GMS 6403). *Lectures, 1984-1996.*

Fundamentals of Biomedical Sciences (GMS 6002), Endocrinology. *Lectures, 1997-2006.*

Signal Transduction (GMS6051). Lectures, *1998-2008.*

Advanced Cardiovascular Physiology (GMS 6410). *Lectures, 1999-2004.*

Biomedical Engineering & Physiology (BME 5001). *Lectures, 2004-2006.*

Fundamentals of Endocrinology (GMS 6405). *Lectures, 2006-2017.*

Responsible Conduct of Biomedical Research (GMS7003). *Lectures & Team-Based Learning, 2007-2017.*

Advances in Hypertension Research (GMS 6413). *Lectures, 2011-2016.*

**CLASSROOM COURSES (Physician’s Assistant-, Dental- and Undergraduate Students):**

Human Physiology for PA and other Health Professions students (APB 3203), Neurophysiology,

Endocrinology and Homeostasis. *Lectures, 1981-1988.*

Dental Physiology (DEN 5120), Endocrinology. *Lectures, 1983-2013.*

Human Physiology for PA students (PAS 5025), Endocrinology & Cardiovascular. *Lectures, 1988-2016.*

Discovering Research and Communicating Science (IDH 3931). *Lecture, 2010-2016.*

Human Physiology in Translation, for Undergraduate students (BMS 3521), Endocrinology. *Lectures, 2013-2016.*

**3: Service**

I have been actively involved in Service at all levels at the University of Florida, as follows.

*UNIVERSITY OF FLORIDA-Campus Wide*

* College of Public Health and Health Professions Tenure and Promotion Committee (2013-2016)
* Selection Committee, UF Teacher/Scholar of the Year Award (2012)
* HHMI Pre-doctoral Award Selection Committee (2010)
* DSR Research Opportunity Grant Review (2007)
* RGP Doctoral Dissertation Awards Committee (2005)
* UF Graduate Council (2004 - 2007)
* Selection Committee, UF Teacher/Scholar of the Year Award (2002 and 2004)
* The Presidential Task Force on the Future of the University of Florida (2002)
* Graduate and Professional Admissions Task Force (2000)
* College of Pharmacy.  Judge for Pharmacy Research Day (2000)
* Search Committee for Associate Dean of Graduate Studies, UF Graduate School, Member (1999)
* Council of Graduate Deans, Member, (1999-2001)
* University of Florida Brain Institute.  Member of the Internal Faculty Advisory Board (1994-1999)
* University of Florida Research Foundation Awards Committee (1997)
* College of Pharmacy.  Judge for the Lippman Award Competition (1995)
* University Senate (1992 - 1994)
* College of Pharmacy; Excellence in Research Competition; Judge for Oral Presentations (1992)
* Division of Sponsored Research.  RDA peer review committee, category 1. (1990)
* University Senate (1988 - 1990)

*UNIVERSITY OF FLORIDA COLLEGE OF MEDICINE*

* College of Medicine Promotion and Tenure Committee (2012-2016)
* Medical Curriculum Oversight Committee (2011 - 2012)
* Medical Student Admissions Committee (2011 - 2017)
* Medical Student Admissions Executive Committee (2011 - 2017)
* Search Committee for Assistant Dean for Admissions, College of Medicine (2010-2011)
* Search Committee for Senior Associate Dean for Faculty Development (2010)
* Chair, Search Committee for Chair of Department of Pharmacology & Therapeutics (2008 - 2009)
* Search Committee for Senior Associate Dean for Educational Affairs (2008 - 2009)
* MD/PhD Program Advisory Committee (2008)
* Search Committee for Chief of Cardiology (2006-2007)
* Faculty Compensation Committee (2006-2007)
* Director, Junior Honors Medical Program (2005-2017).
* LCME Accreditation Task Force - Governance and Administration Committee (Co-Chair) (2005-2007)
* Associate Professor Tenure and Promotion Committee (2005 - 2007)
* Exemplary Teacher Selection Committee (2005)
* Medical Selection Committee (2003-2007)
* Medical Curriculum Committee (2002-2006)
* Medical Student Academic Status Committee (2002-2006)
* University of Florida Research Foundation Professorship Selection Committee (2003)
* IDP Faculty Advisory Board (2001-Present)
* MS in Clinical Investigation, Core Faculty Group (2000-2003)
* Health Center Student Conduct Standards Committee, Member (1999-2001)
* Search Committee for a Medical Education Specialist, Member (2000-2001)
* College of Medicine Education Committee, Member (1998-2001)
* Director, Medical Student Research Program (1999- Present)
* Associate Dean for Graduate Education (1999 -2001).
* Graduate Education Advisory Council, Chair (1999 - 2001).
* IDP Faculty Advisory Board, Chair (1999 - 2001).
* IDP Graduate Studies Committee, Chair (1998).
* Judge for 23rd Annual Medical Guild Graduate Student Research Day (1998).
* Task Force on integration of competency-based learning into the medical curriculum (1997-1998).
* Review Committee for Basic Science Researcher of the Year (1996)
* Co-Director, Interdisciplinary program in Physiology and Pharmacology (1995 - 1996)
* Basic Science Reorganization Steering Committee (1995 - 1996)
* Search Committee for an Assistant Professor for the Markey Faculty Scholar Program (1995 - 1996)
* Advisory Board for Associate Dean for Graduate Education (1995 - 1996)
* Center for Signal Transduction and Drug Development.  Scientific Advisory Panel (1995 - 1997)
* Peer Evaluation Committee (1995)
* Judge for 20th Annual Medical Guild Graduate Student Research Day (1995)
* Professorial Tenure and Promotion Committee (1994 - 1997)
* Chair, U.F. Brain Institute Space Planning Work Team on Tissue Culture Labs/Facilities (1993)
* Associate Dean for Graduate Education - Job Description Committee and Search Committee (1993 - 1995)
* Center for Neurobiological Sciences, Predoctoral Committee (1993 - 1995)
* Dean's Research Advisory Committee (1992 - 1995)
* Interdisciplinary Program in Cell Structure and Function:  Organizing/Admission Committee (1989 - 1992)

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* Chair of Search Committee for New Faculty (2004-2005)
* Search Committee for an Assistant Professor (2002-2003)
* Search Committee for an Assistant Professor (2001)
* Search Committee for an Assistant Professor (1998 - 1999)
* Department of Physiology, University of Florida, Department Vice-Chairman (1995 - 1998)
* Chair of Search Committee for an Assistant Professor (1996 - 1997)
* Peer Evaluation Coordinator (1995 - 2000)
* Chair of Search Committee for an Assistant Professor (1993 - 1994)
* Graduate Coordinator (1988 - 1992)
* Chair of Search Committee for an Assistant Professor (1988 - 1990)
* Seminar Series coordinator (1985 - 1988)
* Search Committee for an Assistant Professor (1983 - 1984)