July, 2023

CURRICULUM VITAE

Christine Saunders, Ph.D.

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Personal Information: Born May 31, 1966 in Bryn Mawr, PA; Trilingual: English/German/Italian

EDUCATION

8/89-7/94	Ph.D., Department of Pharmacology and Toxicology, Philadelphia College of Pharmacy and Science, Philadelphia, PA (Advisor: Margaret T. Weis, Ph.D.) "Mechanism of Preferential Arachidonic Acid Incorporation in Rabbit Heart"
8/84 - 5/88	B.A., History & Pre-med program, Franklin & Marshall College, Lancaster, PA

RESEARCH EXPERIENCE/EMPLOYMENT

4/23 – present	Research Associate Professor; Department of Pharmacology, Vanderbilt University, Nashville, TN
1/18 – present	Scientific writing, editing, consulting, University of Alabama at Birmingham
12/17 – 3/23	Adjunct Associate Professor, Department of Pharmacology, Vanderbilt University
2/09 – 11/17	Research Associate Professor; Department of Pharmacology, Center for Molecular Neuroscience, Vanderbilt University Medical Center, Nashville, TN
9/02 – 1/09	Research Assistant Professor; Department of Pharmacology, Center for Molecular Neuroscience, Vanderbilt University Medical Center, Nashville, TN
3/99 – 8/02	Assistant Professor/Research; UTHSCSA; Department of Biochemistry San Antonio, TX (Supervisor: Merle S. Olson, Ph.D., Chair and Dean of Graduate School)
7/97 – 2/99	Instructor; Department of Pharmacology, Vanderbilt University Medical Center, Nashville, TN (Supervisor: Lee E. Limbird, Ph.D., Associate Vice Chancellor for Research)
10/94 - 6/97	Postdoctoral Research Fellow; Department of Pharmacology, Vanderbilt University Medical Center, Nashville, TN (Supervisor: Lee E. Limbird, Ph.D., Chair)
10/88-8/89 and 8 - 9/94	Research Assistant; SmithKline Beecham Pharmaceuticals, Department of Pharmacology, Renal Division, King of Prussia, PA (Supervisor: Christine R. Albrightson, Ph.D.)

8/89 - 7/94	Graduate Research Assistant, Department of Pharmacology & Toxicology, Philadelphia College of Pharmacy & Science, Philadelphia, PA
Summer 1988	American College of Veterinary Pathologists, Kennett Square, PA Compiled 25-year subject index for scientific journal.
1985 & 1986 (summers only)	Technician; The Lankenau Medical Research Center, Wynnewood, PA; (Supervisor: Karen A. Knudsen, Ph.D.)
summer, 1984	The Stein Research Center, Thomas Jefferson University, Philadelphia, PA

TEACHING EXPERIENCE

1/96-2/96	Cardiovascular physiology for Ph.D.-track pharmacology students, Vanderbilt University, Nashville, TN
Summer, 1994	Autonomic pharmacology for M.S. nurses, Gwynedd-Mercy College, Gwynedd-Valley, PA.
8/89 - 7/94	Teaching Assistant; Chief Coordinator of TAs, Department of Pharmacology & Toxicology, Department of Biology, Philadelphia College of Pharmacy & Science, Philadelphia, PA

HONORS AND AWARDS

ASPET Young Scientist Travel Award 1998 - IUPHAR, Munich, July, 1998.
ASPET Young Scientist Travel Award 1996 - Experimental Biology, Washington, D.C.
PhRMAF Postdoctoral Award/Fellowship in Pharmacology & Morphology, 7/95-7/97
ASPET Graduate Student Travel Award 1994 - IUPHAR, Montreal, July, 1994.
Rho Chi Society (Pharmacy Honor Society)
Sigma Xi, Scientific Honor Society (associate member, PCPS)
Dean's list, Franklin & Marshall College (Fall 1987, Spring 1988)
Presidential Academic Fitness Award, Baldwin (1984)
German Award, Baldwin (1982-1984)

SOCIETIES

American Society for Pharmacology and Experimental Therapeutics - 1993
American Society for Biochemistry and Molecular Biology - 1995
American Society for Cell Biology - 1996
Society for Neuroscience – 2001

REFEREE FOR

Molecular Pharmacology
Journal of Pharmacology and Experimental Therapeutics
Kidney International
Journal of Biological Chemistry
Translational Psychiatry
Journal of Clinical Endocrinology & Metabolism
Journal of Psychiatric Research
Frontiers in Molecular Neuroscience (editorial board)
British Journal of Pharmacology

REVIEWER FOR GRANTS:

- NSF, 2007, 2022 (GRFPs)

UNDERGRADUATE STUDENTS TRAINED:
- 2000-2002: at UTHSCSA: Antoinette Clemons (UT San Antonio, TX)
- 2002-2003: at Vanderbilt: Anita Pai (Martin Luther King magnet high school, Duke University, NC):
won 3rd prize in Middle Tennessee Science & Engineering Fair for research project on calcium-sensing receptor
- 2006: at Vanderbilt: Anna Zhu (Martin Luther King magnet high school, U. of Pennsylvania, PA)
- 2008-2009: at Vanderbilt: Vidiya Sathananthan (Martin Luther King magnet high school, Boston U.)
- 2009-2010: Jennifer Sauer (Vanderbilt University): member of her neuroscience honors program committee.
-summers 2014-2015: Catherine Emery (Taos High School, Vassar College)
-summers 2016-2017: Greta Galli (University School of Nashville, Kenyon College)

GRADUATE STUDENTS TRAINED:
- 2015-2018: Amanda Poe (Vanderbilt University): Masters in Laboratory Investigation (committee member).

GRANTS
PhRMAF Postdoctoral Fellowship in Pharmacology & Morphology, 7/95-7/97:$60,000
Institutional Research Grant (UTHSCSA): $15,000; December, 1999-December, 2001
American Heart Association (Texas Affiliate): Beginning Grant-in-aid: $120,000
July, 2000-July, 2002
NIH: (KO1) NIDDK Mentored Research Scientist Development Award: $270,000
December, 2000-November, 2004;
The Peter F. MacManus Charitable Trust: $50,000; January 1, 2006 – December 31, 2006
The Conte Center Pilot Project (Vanderbilt Conte Center for Neuroscience Research (NIMH): $20,000, 4/2009 – 3/2010.

PUBLICATIONS
Articles
1. Albrightson-Winslow, C.R., Brickson, B., King, A., Olivera, D., Short, B., **Saunders, C.,** Badger, A.M. Beneficial effects of long-term treatment with SK&F105685 in murine lupus nephritis. *J Pharmacol Exp Ther*, **255**(1): 382-387, 1990. PMID: 2145424

2. Weis, M.T., **Saunders, C.** Magnesium and arachidonic acid metabolism. *Magnesium Research,* **6**(2):179-190, 1993. PMID: 8274364

3. **Saunders, C.**, Voigt, J.M., Weis, M.T. Evidence for a single, non-arachidonic acid specific, fatty acyl-CoA synthetase in the heart, which is regulated by magnesium. *Biochem J.*, **313**:849-853, 1996. PMID: 8611165

4. **Saunders, C.**, Keefer, J.R., Kennedy, A.P., Wells, J.N., Limbird, L.E. Receptors coupled to pertussis toxin-sensitive G-proteins traffic to opposite surfaces in Madin-Darby Canine Kidney cells. A_1 adenosine receptors achieve apical and α_{2A} adrenergic receptors achieve basolateral localization. *J Biol Chem,* **271**(2):995- 1002, 1996. PMID: 8557716

5. Szabó, C., **Saunders, C**., O'Connor, M., Salzman, A.L. Peroxynitrite causes energy depletion and increases permeability via activation of polyADP ribosyl synthetase in pulmonary epithelial cells. *Am J Respir Cell Mol Biol,* **16**:105-109, 1997. PMID: 9032115

6. **Saunders, C**., Limbird, L.E. Disruption of microtubules reveals two independent apical targeting mechanisms for G protein-coupled receptors in polarized renal epithelial cells. *J Biol Chem,* **272**(30): 19035-19045, 1997. PMID: 9228087

7. **Saunders, C**., Keefer, J.R., Bonner, C.A., Limbird, L.E. Targeting of G protein-coupled receptors to the basolateral surface of polarized epithelia involves non-contiguous structural signals. *J Biol Chem.* **273**(37): 24196-24206, 1998. PMID: 9727043

8. **Saunders, C**., Limbird, L.E. Microtubule-dependent regulation of α_{2B} adrenergic receptors in polarized MDCKII cells requires the third intracellular loop but not G protein coupling. *Mol Pharmacol*. **57**(1):44-52, 2000. PMID: 10617677

9. **Saunders, C**., Ferrer, J., Shi, L., Chen, J., Merrill, G., Lamb, M.E., Leeb-Lundberg, L.M.F., Carvelli, L., Javitch, J.A., Galli, A. Amphetamine-induced loss of human dopamine transporter activity: an internalization-dependent and cocaine-sensitive mechanism. *Proc Natl Acad Sci U.S.A*. **97**(12): 6850-6855, 2000. PMID: 10823899

10. Clemons, A.P., Holstein, D.M., Galli, A., **Saunders, C.** Cerulein-induced acute pancreatitis in the rat is significantly ameliorated by treatment with MEK1/2 inhibitors U0126 and PD98059. *Pancreas,* **25**(3): 251-259, 2002. PMID: 12370536

11. Galici, R., Galli, A., Jones, D.J., Sanchez, T.A., **Saunders, C.,** Frazer, A., Gould, G.G., Lin, R.Z., France, C.P. Selective decreases in amphetamine self-administration and regulation of dopamine transporter function in diabetic rats. *Neuroendocrinology*, **77**(2): 132-140, 2003. PMID: 12624535

12. Holstein, D.M., Berg, K.A., Leeb-Lundberg, L.M.F., Olson, M.S., **Saunders, C.** Calcium-Sensing Receptor-Mediated ERK1/2 Activation Requires $G\alpha_{i2}$-Coupling and Dynamin-independent Receptor Internalization. *J Biol Chem.* **279**(11): 10060-10069, 2004. PMID: 14701866

13. Wei, Y., Williams, J.M., Dipace, C., Sung, U., Javitch, J.A., Galli, A., **Saunders, C**. Dopamine Transporter Activity Mediates Amphetamine-Induced Inhibition of Akt through a Ca^{2+}/Calmodulin-Dependent Kinase II-Dependent Mechanism. *Mol Pharmacol*. **71**(3):835-842, 2007. PMID: 17164407

14. Williams, J.M, Owens, W.A., Turner, G.H., **Saunders, C**., Dipace, C., Blakely, R.D., France, C.P., Gore, J.C., Avison, M.J., Daws, L.C., Galli, A. Hypoinsulinemia Regulates Amphetamine-Induced Reverse Transport of Dopamine. *PLoS Biology*. **5**(10): 2369-2378, 2007. PMID: 17941718

15. Lute, B.J., Khoshbouei, H., **Saunders, C**., Sen, N., Caron, M.G., Lin, R.Z., Javitch, J.A., Galli, A. PI3K Signaling Supports Amphetamine-induced Dopamine Efflux. *Biochem Biophys Res Comm.* **372**(4): 656-661, 2008. PMID: 18510945

16. Bowton, E.A., **Saunders, C**., Erreger, K.B., Sakrikar, D., Sen, N., Jessen, T., Colbran, R., Caron, Javitch, J.A., M.G., Blakely, R.D., Galli, A. Dysregulation of Dopamine Transporters by Presynaptic Dopamine D2 Autoreceptors Triggers Anomalous Dopamine Efflux Associated with Attention Deficit Hyperactivity Disorder. *J Neurosci.* 30(17):6048-57, 2010. PMID: 20427663

17. Siuta, M.A., Robertson, S.D., Kocalis, H., **Saunders, C**., Khatri, V., Shiota, C., Polley, D.B., Veenstra-Vanderweele, J., Stanwood, G.D., Magnuson, M.A., Niswender, K.D., Galli, A. Dysregulation of the norepinephrine transporter sustains cortical hypodopaminergia and schizophrenia-like behaviors in neuronal Rictor null mice. *PLoS Biology,* 8(6):e1000393, 2010. PMID: 20543991

18. Matthies, H.J.G., Moore, J.L., **Saunders, C.**, Matthies, D.S., Roland, J.T., Lapierre, L., Goldenring, J., Blakely, R., Galli, A. Rab11a Supports Amphetamine-Stimulated Norepinephrine Transporter Trafficking. *J Neurosci.* 30(23):7863-7877, 2010. PMID: 20534835

19. Speed, N.K.*, **Saunders, C. ***, Davis, A.R., Owens, W.A., Matthies, H.J.G., Saadat, S., Kennedy, J., Vaughan, R., Neve, R., Lindsley, C., Russo, S., Daws, L.C., Niswender, K.D., Galli, A. Impaired striatal Akt signaling disrupts dopamine homeostasis and increases feeding. *PLoS One*. 6(9): e25169, 2011. * indicates both authors contributed equally. PMID: 21969871

20. Owens, W.A., Williams, J.M., **Saunders, C.**, Avison, M.J., Galli, A., Daws, L.C. Rescue of dopamine transporter function in hypoinsulinemic rats by a D2 receptor-ERK dependent mechanism. *J Neurosci.*32(8): 2637-47, 2012. PMID: 22357848

21. **Saunders, C.**, Siuta, M.A., Robertson, S.D., Davis, A.R., Sauer, J., Matthies, H.J.G., Gresch, P.J., Airey, D., Lindsley, C.W., Schetz, J.A., Niswender, K.D., Veenstra-Vanderweele, J.M., Galli, A. Neuronal Ablation of p-Akt at Ser473 Leads to Upregulation and Desensitization of Specific 5-HT Receptor Subtypes. *Neurochem Int*., 2013 (pii: S0197-0186(13)00242-8). PMID: 24090638

22. *Hamilton, PJ, *Campbell N, Sharma S, Erreger K, Hansen FH, **Saunders C**., Belovich AN, Sahai, MA, Gether U, McHaourab, HS, Matthies HJ, Sutcliffe JS, Galli A. *De novo* mutation in the dopamine transporter gene associates dopamine dysfunction with autism spectrum disorders. *These authors contributed equally to this work. *Molecular Psychiatry*, doi: 10.1038/mp.2013.102, PMID: 23979605.

22a. Hamilton, PJ, Campbell N, Sharma S, Erreger K, Hansen, FH, **Saunders C**., Belovich AN, Sahai, MS, Cook, EH, Gether U, McHaourab HS, Matthies HJ, Sutcliffe JS, Galli A. *Drosophila melanogaster*: a novel animal model for the behavioral characterization of autism-associated mutations in the dopamine transporter gene. IMAGE: *Mol Psychiatry*. 2013 Dec;18(12):1235. doi: 10.1038/mp.2013.157, PMID: 24253181

23. Bowton, E. *, **Saunders, C. ***, Reddy, I.A., Matthies, H.J.G., Sakrikar, D.J., Blakely, R.D., Erreger, K., Galli, A. SLC6A3 coding variant Ala559Val found in two autism probands alters dopamine transporter function and trafficking. *Translational Psychiatry*, **4**, e464; doi: 10.1038/tp.2014.90, * indicates both authors contributed equally. PMID: 25313507.

24. Hamilton, P.J.*, Belovich, A.N.*, Khelashvili, G. **Saunders, C.**, Erreger, K., Javitch, J., Sitte, H., Weinstein, H., Matthies, H.J.G., Galli, A. PIP2 regulates psychostimulant behaviors through its interaction with a membrane protein. *Nature Chemical Biology*, 10: 583-593, 2014, PMID: 24880859.

25. Cartier, E., Hamilton, P.J., Belovich, A.N., Shekar, A., Campbell, N.G., **Saunders, C.**, Andreassen,T.F., Gether, U., Veenstra-Vanderweele, J.M., Sutcliffe, J.S., Ulery-Reynolds, P.G., Erreger, K., Matthies, H.J.G., Galli, A. Rare autism-associated variants implicate syntaxin 1 (STX1 R26Q) phosphorylation and the dopamine transporter (hDAT R51W) in dopamine neurotransmission and behaviors. *E Bio Medicine*. 2(2): 135-146, 2015. PMID: 25774383

26. **Saunders, C.**, Galli, A. Commentary: Insights in how Amphetamine ROCKs (Rho-associated containing kinase) membrane protein trafficking. *Proc Natl Acad Sci U.S.A*. **112**(51): 15538-39, 2015. PMID: 26607447

27. Reddy, I.A., Smith, N.K., Erreger, K., Ghose, D., **Saunders, C**., Foster, D.J.,Turner, B., Poe, A., Albaugh, V., McGuinness, O., Hackett, T.A., Grueter, B., Abumrad, N.N., Flynn, C.R.*, Galli, A.* Bile diversion, a bariatric surgery, and bile acid signaling reduce central cocaine reward. *PLoS Biology*, **16**(7): e2006682, July 2018.

28. Barry, R.L., Byun, N.E., Williams, J.M., Siuta, M.A., Tantawy, M.N., Speed, N.K., **Saunders, C.,** Galli, A., Niswender, K.D., Avison, M.J. Brief Exposure to Obesogenic Diet Disrupts Brain Dopamine Networks. *PLoS One,* **13**(4):e0191299, April 2018. PMID: 29698491

Reviews

1. Wozniak, M., Keefer, J.R., **Saunders, C.**, Limbird, L.E. Differential targeting and retention of G protein-coupled receptors in polarized epithelial cells. *J Receptor & Signal Transduction Res.* **17:** 373-383*,* 1997. PMID: 9029502

2. **Saunders, C.**, Limbird, L.E. Localization and trafficking of alpha2-adrenergic receptor subtypes in cells and tissues. *Pharmacology & Therapeutics.* **84**(2): 193-205, 1999. PMID: 10596906

3. Wozniak, M., **Saunders, C**., Schramm, N.L., Keefer, J.R., Limbird, L.E. Morphological and biochemical strategies for monitoring trafficking of epitope-tagged G protein-coupled receptors in agonist-naïve and agonist-occupied states. *Meth Enzymology* **343:**530-544, 2002. PMID: 11665590

4. Daws, L.C., Robertson, S.D., Niswender, K.D., Avison, M.J., Galli, A., **Saunders, C.** Insulin signaling and Addiction. *Neuropharmacology.* 2011. PMID: 21420985

Book Chapters:

1. Sulzer, D. Kahlig, K.M., Schmitz, Y., **Saunders, C.**, Galli, A. Amperometric recording of ampheteamine-induced dopamine efflux. *Transporters.* John Wiley and Son, Inc., NY, NY, 2003.

2. Erreger, K., Matthies, H.J.G., Galli, A., **Saunders, C.** Neurotransmitter Transporters. *Encyclopedia of Biological Chemistry, 2nd Edition*. Elsevier, Oxford, UK, 2011.

INVITED LECTURES:

1994

1. Vanderbilt University, Department of Pharmacology, February, 1994: (Invited by: Colin Funk, Ph.D., Lee E. Limbird, Ph.D., Chair).
2. Harvard University, Massachusetts General Hospital, Department of Clinical Pathology, MA, March, 1994: (Invited by: Michael Laposata, M.D., Ph.D., Director).

1996

3. University of Würzburg, Department of Pharmacology and Toxicology, Germany, July, 1996: (Invited by: Martin Lohse, Ph.D., Chairman).
4. University of Heidelberg, Institute for Neurobiology, Germany, August, 1996: (Invited by: Wieland Huttner, M.D., Chairman).
5. University of Heidelberg, Institute for Biochemistry, Germany, August, 1996: (Invited by: Felix Wieland, Ph.D., Chairman).
6. Karolinska Institute, Department of Medical Nutrition, Stockholm, Sweden, August, 1996: (Invited by: Jan-Åke Gustaffson, Ph.D., Chairman).

1997

7. Merck Research Labs, Department of Pharmacology, West Point, PA, January, 1997: (Invited by: Robert J. Gould, Ph.D., Senior Director).

8. PhRMA Foundation Annual Awardee Meeting, February, 1997: (Invited by: Maurice Q. Bectel, D. Sc., President).
9. Novartis Pharmaceuticals Corporation, Diabetes Pharmacology, Summit, NJ, October, 1997: (Invited by: Bork Balkan, Ph.D.).

1998

10. University of Texas Health Science Center in San Antonio, Department of Pharmacology, San Antonio, Texas, May, 1998: (Invited by: Alan Frazer, Ph.D., Chair)
11. Eli Lilly Pharmaceuticals, Department of Research, Technologies and Proteins, Indianapolis, IN, May, 1998: (Invited by: Jonathan Lee, Ph.D., Division Head)
12. Astra Arcus, USA, Department of Pharmacology, Neuroprotection Division, Rochester, NY, June, 1998: (Invited by: Jerry Miller, Ph.D., Division Head)
13. Schering-Plough Research Institute, CNS & CV Research, Kenilworth, NJ, July, 1998: (Invited by: Eric Parker, Ph.D., Division Head)

2000

14. University of Texas Health Science Center in San Antonio, Department of Pediatrics, San Antonio, Texas, May, 2000: (Invited by: Steven Seidner, M.D., Division Chief)

2001

15. Trinity University, Department of Biology, November, 2001: (Invited by: Jonathan M. King, Ph.D.)

2007

16. Ensworth High School, Nashville, TN, May, 2007 (Invited by Jessica Field, Ph. D., Department Chair of Biological Sciences).