

## Timothy J Searl

My current research is focused on understanding the role astrocytes play in in modulating neuronal dysfunction in the basal ganglia using mouse models for Huntington's disease, utilizing both *ex vivo* and *in vivo* techniques. My hope is that this will provide insight into this devastating disease and help identify potential therapeutic approaches to help patients.

### Education:

BSc (Hons) Pharmacology: University of Dundee, Dundee, UK: Completion 06/1987

PhD Pharmacology & Physiology: University of Strathclyde, Glasgow: Completion 12/1990

### Employment:

01/1991-04/1995: Department of Pharmacology, University of Oxford, UK. Postdoctoral Research Assistant

05/1995-2020: Department of Pharmacology, Northwestern University, Chicago, USA. Research Assistant

03/2020-2022: Department of Urology, University of Illinois, Chicago, USA. Visiting Research Assistant Professor.

2023-Present: Department of Neuroscience, Northwestern University, Chicago, USA. Research Assistant.

### B. Positions and Honors

1986-1990 Research Assistant, University of Strathclyde, Glasgow, UK

1991-1995 Post Doctoral Research Assistant, University of Oxford, Oxford, UK

1995-2001 Research Associate, Department of Pharmacology and Molecular Pharmacology. Northwestern University, Chicago, IL

2001-2014 Research Assistant Professor, Department of Molecular Pharmacology and Biological Chemistry. Northwestern University, Chicago, IL

2014- 2020 Research Assistant Professor, Department of Pharmacology, Northwestern University, Chicago, IL.

2014- 2016 Visiting Research Faculty, Department of Medicine, SIU Medical School, Springfield, IL

2020- Visiting Research Assistant Professor, Department of Urology, University of Illinois, Chicago, IL

### Other Experience and Professional Memberships

2005 Co-chair and speaker (Modulation of calcium-dependent and independent acetylcholine release from motor nerve endings) in the "Neuromuscular Junction" session of XII International Symposium on Cholinergic Mechanisms, Alicante, Spain, Oct 1-5, 2005.

2011- Member, American Society for Pharmacology and Experimental Therapeutics

### Publications:

Prior C, Searl T, Marshall IG. (1989) The effects of l-vesamicol on transmitter release from rat motor nerve terminals at high frequencies of nerve stimulation. Br. J. Pharmacol. 98 Suppl: 826P

- Searl T, Prior C, Marshall IG. (1990) The effects of L-vesamicol, an inhibitor of vesicular acetylcholine uptake, on two populations of miniature endplate currents at the snake neuromuscular junction. *Neuroscience*. 35: 145-156.
- Searl T, Prior C, Marshall IG. (1991) Acetylcholine recycling and release at rat motor nerve terminals studied using (-)-vesamicol and troxpyrrolium. *J Physiol*. 444: 99-116.
- Searl TJ, Cunnane TC. (1993) Neurotransmitter release mechanisms in sympathetic and parasympathetic nerve terminals. *Biochem Soc Trans*. 21: 416-20.
- Cunnane TC, Searl TJ. (1994) Neurotransmitter release mechanisms in autonomic nerve terminals. *Adv Second Messenger Phosphoprotein Res*. 29:425-59.
- Redman RS, Searl TJ, Hirsh JK, Silinsky EM. (1997) Opposing effects of phorbol esters on transmitter release and calcium currents at frog motor nerve endings. *J Physiol*. 501: 41-48.
- Searl TJ, Silinsky EM. (1998) Increases in acetylcholine release produced by phorbol esters are not mediated by protein kinase C at motor nerve endings. *J Pharmacol. Exp. Ther*. 285: 247-251.
- Searl TJ, Redman RS, Silinsky EM. (1998) Mutual occlusion of P2X ATP receptors and nicotinic receptors on sympathetic neurons of the guinea-pig. *J Physiol*. 510: 783-91.
- Searl TJ, Silinsky EM. (1998) Cross-talk between apparently independent receptors. *J Physiol*. 513: 629-30.
- Silinsky EM, Hirsh JK, Searl TJ, Redman RS, Watanabe M. (1999) Quantal ATP release from motor nerve endings and its role in neurally mediated depression. *Prog Brain Res*. 120:145-58.
- Searl TJ, Silinsky EM. (2000) The phosphatidylinositol 4-kinase inhibitor phenylarsine oxide blocks evoked neurotransmitter release by reducing calcium entry through N-type calcium channels. *Br J Pharmacol*. 130: 418-24.
- Hirsh JK, Searl TJ, Silinsky EM. (2002) Regulation by Rab3A of an endogenous modulator of neurotransmitter release at mouse motor nerve endings. *J. Physiol*. 545:337-43.
- Searl TJ, Silinsky EM. (2002) Evidence for two distinct processes in the final stages of neurotransmitter release as detected by binomial analysis in calcium and strontium solutions. *J. Physiol*. 539: 693-705.
- Silinsky EM, Searl TJ. (2003) Phorbol esters and neurotransmitter release: more than just protein kinase C? *Br. J. Pharmacol*. 138: 1191-1201.
- Searl TJ, Silinsky EM. (2003) Phorbol esters and adenosine affect the readily releasable neurotransmitter pool by different mechanisms at amphibian motor nerve endings. *J. Physiol*. 553:445-56.
- Searl TJ, Silinsky EM. (2005) Modulation of Ca(2+)-dependent and Ca(2+)-independent miniature endplate potentials by phorbol ester and adenosine in frog. *Br. J. Pharmacol*. 145: 954-62.
- Searl TJ, Silinsky EM. (2005) LY 294002 inhibits adenosine receptor activation by a mechanism independent of effects on PI-3 kinase or casein kinase II. *Purinergic Signal*. 1:389-94.
- Searl TJ, Silinsky EM. (2006) Modulation of calcium-dependent and -independent acetylcholine release from motor nerve endings. *J. Mol. Neurosci*. 30:215-8.
- Searl TJ, Silinsky EM. (2008) Mechanisms of neuromodulation as dissected using Sr<sup>2+</sup> at motor nerve

endings. *J. Neurophysiol.* 99:2779-88.

Searl TJ, Silinsky EM. (2010) The mechanism for prejunctional enhancement of neuromuscular transmission by ethanol in the mouse. *J. Pharmacol. Exp. Ther.* 335: 465-471.

Searl TJ, Silinsky EM. (2010) Post-junctional interactions between neuromuscular blocking agents and ethanol at the mouse neuromuscular junction. *Br. J. Pharmacol.* 161: 659-667.

Searl TJ, Silinsky EM. (2012) Evidence for constitutively-active adenosine receptors at mammalian motor nerve endings. *Eur. J Pharmacol.* 685: 38-41.

Searl TJ, Silinsky EM. (2012) Modulation of purinergic neuromuscular transmission by phorbol dibutyrate is independent of protein kinase C in murine urinary bladder. *J Pharmacol. Exp. Ther.* 342: 312-317.

Searl TJ, Dynda DI, Alanee SR, El-Zawahry AM, McVary KT & Silinsky EM. (2016) A<sub>1</sub> Adenosine Receptor-Mediated Inhibition of Parasympathetic Neuromuscular Transmission in Human and Murine Urinary Bladder. *J. Pharmacol. Exp. Ther.* 356:116-122.

Yang W, Searl TJ, Yaggie R, Schaeffer AJ, Klumpp DJ. (2018) A MAPP Network study: overexpression of tumor necrosis factor- $\alpha$  in mouse urothelium mimics interstitial cystitis. *Am. J. Physiol. Renal Physiol.* 315: F36-F44.

Aguiniga LM, Searl TJ, Rahman-Enyart A, Yaggie RE, Yang W, Schaeffer AJ, Klumpp DJ. (2020) Acyloxycyl hydrolase regulates voiding activity. *Am. J. Physiol. Renal. Physiol.* 318: F1006-F1016.

Searl T, Ohlander S, McVary KT, Podlasek CA. (2022) Pathway Enrichment Analysis of Microarray Data From Human Penis of Diabetic and Peyronie's Patients, in Comparison With Diabetic Rat Erectile Dysfunction Models. *J Sex Med.*19:37-53.

Martin S, Deng J, Searl T, Ohlander S, Harrington DA, Stupp SI, Dynda D, McVary KT, Podlasek CA. (2022) Sonic Hedgehog Signaling in Primary Culture of Human Corpora Cavernosal Tissue From Prostatectomy, Diabetic, and Peyronie's Patients. *J Sex Med.* 19:1228-1242.

Searl T, Ohlander S, McVary KT, Podlasek CA. Pathway analysis of microarray data from corpora cavernosal tissue of prostatectomy and Peyronie's patients, in comparison with a cavernous nerve injured rat model of erectile dysfunction. IN press *J Sex Med* 2022.