Scott Robert Johnstone
Curriculum vitae

Contact:
The Fralin Biomedical Research Institute
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Date of Birth: 19th July 1978 **Nationality:** British

Qualifications:

	PGCAP:	University of Glasgow, 2013-2015
	PhD:	Glasgow Caledonian University, 2004-2008
	BSc:	[1st Class Hons] Biological and Biomedical Sciences, 2001-2004
	HND:	Applied Science, 1996-2000

Prizes:
University of Virginia, Outstanding Post-Doc award 2009
Glasgow Caledonian University, Travel Award, 2007
Institute of Biomedical Science, Presidents Prize, 2004

Current Post:

Jul 2020 – Present:	Assistant Professor, Fralin Biomedical Research Institute, Virginia Tech Carillion.
Jul 2020 – Present:	Assistant Professor, Department of Biological Sciences, Virginia Tech.

Previous Posts:

Dec 2017 – Jul 2020:	Instructor of Research, Robert M. Berne Cardiovascular Research Centre, University of Virginia.
Oct 2016–Dec 2017:	Lecturer in Biomedical Sciences, School of Health and Life Sciences Glasgow Caledonian University, Glasgow.
Oct 2012–Sept 2016:	Lord Kelvin Adam Smith Post-Doctoral Fellow, British Heart Foundation Glasgow Cardiovascular Research Centre (BHFGCRC), University of Glasgow.
Jun 2008–Sep 2012:	American Heart Association Post-Doctoral Research Fellow, Robert M. Berne Cardiovascular Research Center, University of Virginia

Research & Teaching Themes

I am a cell biologist with an emphasis on understanding the physiology and pathophysiology of the vasculature. Within the vascular system, I have focused on cell-to-cell communication through single membrane channels such as the pannexin channels and via intercellular communication pathways through gap junction channels. A major aspect of my research has been understanding how protein modifications (e.g. phosphorylation and nitrosylation) regulate channel signaling and protein interactions (e.g. Cx43/cyclin E), and on the identification of novel therapeutic targets. My research themes involve three main aspects of cardiovascular disease namely: i) Identifying pathways regulating the recruitment of inflammatory cells in the vasculature, ii) Understanding the processes of vascular cellular proliferation, and iii) Identification of potential targets for therapeutic intervention. In all of my studies I have

employed a wide range of approaches to help understand the disease processes from the biochemical level in cells, to whole animal studies and translation in human disease pathology.

I have a passion for teaching at both graduate and undergraduate level. I am PGCAP certified and a Fellow of the UK Higher Education Academy. I have taught undergraduate and graduate level classes, lead workshops and mentored students at Glasgow Caledonian University, the University of Glasgow and at the University of Virginia. My focus is on promoting student excellence through training and enhancing the student experience and by providing teaching that improves graduate attributes. In my teaching, I aim to provide an environment that centers on excellence in teaching and on promoting engagement and learning. At the graduate level I have mentored a number of graduate and masters project students and worked with graduate students to develop their careers by establishing training networks e.g. the Young Investigator Network (aimed at PhD students) and the Interdisciplinary Research Network (aimed at post-doc and new lecturer) at the University of Glasgow.

Teaching:

2020	Virginia Tech: Graduate Level, Translational Biology, Medical and Health
2019-2020:	University of Virginia: Graduate level, Vascular Biology
2016-2017:	Glasgow Caledonian University: L1-3 Undergradate and Masters, lectures, tutorials and laboratories in Biomedical Sciences and Framework courses
2015-2016:	University of Glasgow: L3 Undergraduate Biochemistry and Metabolism, lectures and laboratories.
2011-2012:	University of Virginia: Graduate Level physiology (BIMS 8320)

Supervision:

PhD:

2017-2019	Yang Yang (visiting Chinese PhD candidate). Project title: Pannexins as modulators of the inflammatory response within the vasculature.
2016-2020	Sabrina Galinanes (Third supervisor) The University of Glasgow: LKAS PhD student. Project title: Programmable vesicles for RNAi-based targeted drug delivery
2016-2020	Li Dong (Second Supervisor) The University of Glasgow: Project title: Trafficking and regulation of Connexin 43 in normal and diseased epithelial tissue networks.

Masters/ Undergraduate:

2016-2017	Chloe McAuley, Rachel Smith (Undergraduate)
2015-2016	Margirit Kamel, Manjari Trivedi, Chen-Hsuin (Abraham) Lee and Gordon Proctor (Masters), Ehsan Salim (Undergraduate, vacation scholarship)
2014-2015:	Quentin Lachaud (MRes/ PhD rotation), Lindsay Crowe and Xiaofeng Han (Masters), Laura Fitzpatrick (Undergraduate)
2013-2014:	Greig Dougall (Masters), Cassandra Teng and Ali Jan (Vacation scholarship)
2012-2013:	Osama Alazwari (Masters), Jordan Clark (Undergraduate)

Current Research Support:

2019 – 2022	American Heart Association, Career Development Award AHA:19CDA34630036

Previous Research Support:

2016 – 2017	Carnegie Trust for the Universities of Scotland
2015 – 2016	Wellcome Trust ISSF Consolidator Grant
2012 – 2016	Lord Kelvin Adam Smith Post-Doctoral Fellowship,

	University of Glasgow
2015	ICAMS Small Grant Scheme, University of Glasgow
2011 – 2012:	Co-Investigator Philip Morris Initiative, University of Virginia
2010 – 2012:	American Heart Association, Postdoctoral Fellowship
2007 – 2008:	PhD student grant Carnegie Trust for the Universities of Scotland
2005 – 2006:	PhD student grant Carnegie Trust for the Universities of Scotland

Organizations:
American Heart Association (AHA)
British Society for Cardiovascular Research (BSCR)
British Atherosclerosis Society (BAS)
British Cardiovascular Society (BCS)
Biochemical Society
Fellow of the Higher Education Academy (FHEA)

Presentations:
13 conferences and invited speaker presentations speaker since 2008
Invited speaker: Science Expression (aCoruna Spain 2015, 2016)
Gap Junction Conference (2011, 2015, 2017, 2019)
Therapeutic applications (2015/2016)

Conferences:
American Society for Cellular Biology: 2008, 2009, 2011
Arteriosclerosis Thrombosis and Vascular Biology: 2013
British Cardiovascular Society/ British Atherosclerosis: 2014
British Society for Cardiovascular Research: 2015
Experimental Biology: 2012
Gap Junction meeting, UK/ Scotland: 2006, 2008, 2012, 2014, 2016
Gap Junction meeting, International: 2007, 2009, 2011, 2013, 2015, 2017, 2019
International Symposium, Cardiovascular Disease: 2014

Conf. Organizer:
International Gap Junction Meeting, Glasgow 2017
The British Society for Cardiovascular Research, Autumn Meeting, 2015
UK Gap Junction Meetings: 2012, 2014

Editorial Roles

Editor:
Junior Associate Editor: Journal of Vascular Research:
Aug 2020- Present
Editor: Gap Junction Protocol Book, *Springer Series 2016. DOI:* https://doi.org/10.1007/978-1-4939-3664-9. 14,000 dowloads.
2016
Guest Editor: Review series following the 8th UK Gap Junction meeting. Biochemical Society Transactions.
2015

Funding Review:
Biotechnology and Biological Sciences Research Council (BBSRC) UK (2013, 2014)

Journal Review:
Arteriosclerosis Thrombosis and Vascular Biology; Atherosclerosis; Biochemical Pharmacology; Cell Physiology and Biochemistry; Cellular Signaling; Circulation Research; Europace; FEBS Letters; Hypertension; International Journal of Molecular Sciences; Journal of Biological Chemistry; Journal of Cellular Biochemistry; Journal of Cardiovascular Research, Journal of Cellular Physiology; Journal of the Royal Society

Interface; Journal of Vascular Research; Microcirculation; Lipids; Molecular Carcinogenesis; Physiology; Scientific Reports; The Anatomical Record

Patents

- U.S. Provisional Patent filed with UVA-LVG (07/25/2019) : "Modification of mitogen activated protein kinase phosphorylated connexins 43 and cyclin E activity to control arterial smooth muscle proliferation"

Publications: https://www.ncbi.nlm.nih.gov/pubmed/?term=Johnstone+SR

1. **Scott R. Johnstone**, Jeremy Ross, Michael J. Rizzo, Adam C. Straub, Paul D. Lampe, Norbert Leitinger and Brant E. Isakson. Oxidized phospholipid species promote in vivo differential Cx43 phosphorylation and vascular smooth muscle cell proliferation. *Am J Path.* 175(2):916-24; 2009. PMID: 20651288
2. **Scott R. Johnstone**, Brant E. Isakson and Darren Locke. Biological and biophysical properties of vascular connexin channels. *Int Rev Cell Mol Biol*. 278:69-118; 2009. PMID: 19815177
   - Invited Review
   - Journal Cover Art
3. **Scott R. Johnstone**, Angela K. Best, Catherine S. Wright, Brant E. Isakson, Rachel J. Errington and Patricia E. Martin. Enhanced connexin 43 expression delays intra-mitotic duration and cell cycle traverse independently of gap junction channel function. *J Cell Biochem*. 1;110(3):772-82; 2010. PMID: 20512937
4. Adam C. Straub, **Scott R. Johnstone**, Katherine R. Heberlein, Michael J. Rizzo, Angela K. Best, Scott Boitano and Brant E. Isakson. Site-specific connexin phosphorylation is associated with reduced heterocellular communication between smooth muscle and endothelium*. J Vasc Res*. 16;47(4):277-286; 2010. PMID: 20016202
5. Alexandr Kadl, Akshaya K. Meher AK, Poonam R. Sharma, Monica Y Lee, Amanda C. Doran, **Scott R. Johnstone**, Michael R. Elliott, Florian Gruber, Jennifer Han, Wenshu Chen, Thomas Kensler, Kodi S. Ravichandran, Brant E. Isakson, Brian R. Wamhoff, Norbert Leitinger. Identification of a novel macrophage phenotype that develops in response to atherogenic phospholipids via Nrf2. *Circ Res.* 107:737-746; 2010. PMID: 20651288
   - Circulation Research Most Read 2010-2011 list. Circ. Res. 2012; 111: e338-e378, doi: 10.1161/ CIRCRESAHA.112.281089
6. Marie Billaud, Alexander W. Lohman, Adam C. Straub, Robin Looft-Wilson, **Scott R. Johnstone,** Christina A. Araj, Angela K. Best, Faraaz Chekeni, Kodi Ravichandran, Silvia Penuela, Dale W. Laird and Brant E. Isakson. Pannexin1 regulates α1-adrenoreceptor-mediated vasoconstriction. *Circ Res.* 109 (1): 80-5; 2011. PMID: 21546608
   - Cover Art
   - Commentary: Pannexin 1 in the regulation of vasoconstriction. *Circ Res*, 109 (1). 2011
7. Michael Koval, Marie Billaud, Adam C. Straub, **Scott R. Johnstone**, Alexander Zarbock, Brian R. Duling and Brant E. Isakson. Spontaneous lung dysfunction and fibrosis in mice lacking connexin 40 and endothelial cell connexin 43. *Am J Pathol.* 178(6):2536-46; 2011. PMID: 21641379
8. Adam C. Straub, Marie Billaud, **Scott R. Johnstone**, Angela K. Best, Sean Yemen, Scott T. Dwyer, Robin Looft-Wilson, Jeffery J. Lysiak, Ben Gaston, Lisa Palmer and Brant E. Isakson. Compartmentalized connexin 43 *S*-nitrosylation/de-nitrosylation regulates heterocellular communication in the vessel wall. *Arterio Thromb Vascular Biol.* 2:399-407; 2011. PMID: 21071693
   - Cover Art

9. Robin C. Looft-Wilson, Marie Billaud, **Scott R. Johnstone**, Adam C. Straub, and Brant E. Isakson. Interaction between nitric oxide signaling and gap junctions: Effects on vascular function. *Biochimica et Biophysica Acta - Reviews on Biomembranes.* 1818 (8):1895-902; 2012. PMID: 21835160
    - Invited Review
10. **Scott R. Johnstone**, Marie Billaud, Alexander W. Lohman, Evan P. Taddeo and Brant E. Isakson. Post-translational modifications in connexins and pannexins. *J Memb Biol.* 245 (5-6):319-332; 2012. PMID: 22739962
11. Marie Billaud, **Scott R Johnstone** and Brant E Isakson. Loss of compliance in small arteries, but not in conduit arteries, after six weeks exposure to high fat diet. *J Cardiovasc Transl Res.* 5 (3):256-63; 2012. PMID: 22467359
12. Marie Billaud, Alexander W Lohman, Adam C Straub, **Scott R Johnstone** and Brant E Isakson. Characterization of the thoracodorsal artery: morphology and reactivity. *Microcirc.* 19 (4):360-372; 2012. PMID: 22335567
13. **Scott R. Johnstone**, Brett Kronke, Adam C. Straub, Angela K. Best, Clarence A. Dunn, Leslie A. Mitchell, Yelena Peskova, Robert K. Nakomoto, Michael Koval, Paul D. Lampe, Linda Columbus and Brant E. Isakson. MAPK phosphorylation of connexin 43 promotes binding of cyclin E and smooth muscle cell proliferation. *Circ Res.* 111:201-211; 2012. PMID: 22652908
    - Cover Art
    - Commentary on: Cx43 phosphorylation and VSMC proliferation 111 (2); 2012
    - Editors Pick
    - Top downloaded article July 2012
14. Adam C. Straub, Alexander W. Lohman, Marie Billaud, **Scott R. Johnstone**, Scott T. Dwyer, Monica Y. Lee, Pamela Schoppee-Bortz, Angela K. Best, Linda Columbus, Benjamin Gaston and Brant E Isakson. Endothelial cell expression of hemoglobin α regulates nitric oxide signaling. *Nature.* 491:473-477; 2012. PMID: 23123858
    - Commentary: Nitric oxide caught in traffic. *Nature.* 491:344-345; 2012
15. Alexander W. Lohman, Marie Billaud, Adam C. Straub, **Scott R. Johnstone**, Angela K. Best, Monica Y. Lee, K. Barr, Sylvia Penuela, Dale W. Laird and Brant Isakson. Expression of pannexin isoforms in the systemic murine arterial network. *J Vasc Res.* 49:405-416; 2012. PMID: 22739252
16. Marie Billaud, Alex W. Lohman, **Scott R. Johnstone**, Lauren Biwer, Stephanie Mutchler and Brant E Isakson. Regulation of cellular communication by signaling microdomains. *Pharmacol Rev.* 26;66(2): 513-69; 2014. PMID: 24671377
17. Annabel Campbell, **Scott R Johnstone**, George Baillie and Godfrey Smith. β-adrenergic modulation of myocardial conduction velocity: connexins vs. sodium current. *J Mol Cell Cardiol.* 77:147-154; 2014. PMID: 25453599
18. Sun Peng, Li Dong, Alasdair L. McDonald, Shahzrad Akbari, Michael Edward, Malcolm B. Hodgins, **Scott R. Johnstone**, Sheila V. Graham. HPV16 E6 controls the gap junction protein Cx43 in cervical tumour cells. *Viruses.* 7:5243-56; 2015. PMID: 26445057
19. Cheng-Hung Chen, Jamie N. Mayo, Robert G. Gourdie, **Scott R. Johnstone**, Brant E. Isakson, and Shawn E. Bearden. The connexin 43/ZO-1 complex regulates cerebral endothelial f-actin architecture and migration. *Am J Cell Physiol.* 309:600-607; 2015. PMID: 26289751
20. Alexander W. Lohman, Igor Leskov, Joshua Butcher, **Scott Johnstone**, Tara A. Stokes, Leon J. DeLalio, Angela K. Best, Silvia Peñuela, Norbert Leitinger, Kodi S. Ravichandran, Karen Stokes, and Brant Isakson. Pannexin 1 channels regulate leukocyte emigration through venous endothelium during acute inflammation. *Nat. Comm*. 6:7965; 2015. PMID: 26242575

21. Sara Crespo Yanguas, Joost Willebrords, **Scott R. Johnstone**, Michaël Maes, Elke Decrock, Marijke De Bock, Luc Leybaert, Bruno Cogliati, Mathieu Vinken. Pannexin 1 as a mediator of Inflammation and cell death. *Biochem Bioph Act Mol Cell Res.* 1864(1):51-61; 2017. PMID: 27741412
22. Chrysa Faniku, Erin O'Shaughnessy, Claire Lorraine, **Scott R. Johnstone**, Annette Graham, Sebastian Greenhaugh and Patricia E.M. Martin The connexin mimetic peptide Gap27 and SiRNA strategies reveal differential roles for Cx43 in wound closure events in skin model systems. *Int J Mol Sci.* 18;19(2). Pii E604; 2018. PMID: 29463027
23. Trond Aasen*, **Scott R. Johnstone***, Laia Vidal-Brime, K. Sabrina Lynn and Michael Koval*. Connexins: synthesis, post-translational modifications and trafficking in health and disease. *Int J Mol Sci.* 26:19(5). Pii E1296; 2018. PMID: 29701678
    - **corresponding author*
24. Leon J. DeLalio, Alexander S. Keller, Jiwang Chen, Andrew K.J. Boyce, Mykhaylo Artamonov, Henry R. Askew-Page, T.C. Steven Keller 4th, **Scott R. Johnstone**, Rachel B. Weaver, Miranda E Good, Sara Murphy, Angela Best, Ellen L. Mintz, Silvia Penuela, Ian Greenwood, Machado RF, Avril V Somlyo , Leigh A. Swayne, Richard Minshall, Brant E Isakson. Interaction Between Pannexin 1 and Caveolin-1 in Smooth Muscle Can Regulate Blood Pressure. *Arterio Thromb Vascular Biol.* 38(9):2065-2078; 2018. PMID: 30026274
25. Leon J. DeLalio, Marie Billaud, Claire A. Ruddiman, **Scott R. Johnstone**, Joshua T. Butcher, A G. Wolpe, X Jin, T.C. Steven Keller, T. Riviera, Miranda E. Good, Angela K. Best, Alexander W. Lohman, Silvia Penuela, Roger J. Thompson, Paul D. Lampe, Mark Y. Yeager and Brant E. Isakson. Constitutive SRC-mediated phosphorylation of pannexin 1 at tyrosine 198 occurs at the plasma membrane. *J Biol Chem*. 26;294(17):6940-6956; 2019. PMID: 30814251.
26. Matteo Ottolini, Kwangseok Hong, Eric L. Cope, Zdravka Daneva, Leon J. DeLalio, Jennifer D. Sokolowski, Corina Marziano, Nhiem Y. Nguyen, Joachim Altschmied, Judith Haendeler, **Scott R. Johnstone**, Mohammad Y. Kalani, Min S. Park, Rakesh P. Patel, Wolfgang Liedtke, Brant E. Isakson, Swapnil K. Sonkusare. Local Peroxynitrite Impairs Endothelial TRPV4 Channels and Elevates Blood Pressure in Obesity. Circulation 2020 Apr 21;141(16):1318-1333. PMID: 32008372
27. Yang Yang, Leon Delalio, Angela K. Best, Edgar Maccal, Daniela Begandt, Chen-Hsuin Lee, Jenna Milstein, Iona Donnelly, Ashley M. Miller Martin McBride, Xiaohong H. Shu, Michael Koval, Brant E. Isakson and **Scott R. Johnstone**. Endothelial pannexin 1 channels control inflammation by regulating intracellular calcium. The *J. of Immunol.* 2020 Jun 1;204(11):2995-3007. PMID 32312847
    - Commentary by Juan C Sanchez Arias et al PANX1 in inflammation heats up: New mechanistic insights with implications for injury and infection. *Cell Calcium* 2020 Jul 13;90:102253. doi: 10.1016/j.ceca.2020.102253. PMID: 32688074
28. Leon J DeLalio, Ester Masati, Suresh Mendu, Claire A Ruddiman, Yang Yang, **Scott R Johnstone**, Jenna A. Milstein, T.C. Stevenson Keller IV, Rachel B Weaver, Nick A. Guagliardo, Angela K Best, Kodi Ravichandran, Douglas A Bayliss, Maria Luisa S. Sequeira-Lopez, Swapnil N. Sonkusare, Bimal Desai, Paula Q. Barrett, Thu H. Le, Ariel R Gomez, and Brant E Isakson. Pannexin 1 channels in renin-expressing cells regulate renin secretion and blood pressure homeostasis. Kindey Int. 2020;S0085-2538(20)30543-3. doi: 10.1016/j.kint.2020.04.041
    - Commentary by Francois Alhenc-Gelas. A new channel for the control of renin secretion in juxtaglomerular cells**. Kidney Int.** 2020 Sep;98(3):543-545. PMID: 32828234

Manuscripts in Review

29. Daniela Begandt, H. Skye Comstra, Samuel A Molina, Nenja A Krüger, Lauren Biwer, **Scott R Johnstone**, Alexander Lohman, Miranda E Good, Leon J DeLalio, Kwangseok Hong,

Hannah Bacon, Swapnil K. Sonkusare, Michael Koval, Brant E Isakson. Pannexin 1 activates a purinergic venous-specific cascade to induce endothelial permeability. *In Review*.

30. Yang Yang, Edgar Maccal, George Baillie, Brant E. Isakson and **Scott R. Johnstone**. A novel peptide targeting Connexin 43 reduces vascular remodeling. *In Review*
31. Scott R. Johnstone, Miranda E. Good, Alexander Keller, Isola Brown, Swapnil K. Sonkusare and Brant E. Isakson. Cell to cell communication. *In Review*
    - Invited Review, *Comprehensive Physiology*

Book Chapters

32. Marie Billaud*; **Scott R. Johnstone***; Katherine R. Heberlein; Adam C. Straub and Brant E. Isakson. Effects of oxidative stress on connexins/pannexins in the vasculature. Connexin Cell Communication Channels: Roles on the Immune System and Immunopathology. *Published by Taylor and Francis, New York, 2011.* Editors: E. Oviedo-Orta, B. R. Kwak and W. H. Evans
    - *Indicates co-first authors
33. Miranda E. Good, Daniella Begandt, Leon J. Delalio, Scott R. Johnstone and Brant E. Isakson. Small Interfering RNA-Mediated Connexin Gene Knockdown in Vascular Endothelial and Smooth Muscle Cells. *Gap Junction Protocols,* Publisher: Springer Science and Media. Editors: Mathieu Vinken and **Scott R. Johnstone**. *Methods Mol Biol.* 1437: 71-82; 2016. PMID: 27207287
34. Alex W. Lohman, Adam C. Straub and **Scott R. Johnstone**. Identification of Cx43 phosphorylation and *S*-nitrosylation in cultured primary vascular cells. *Gap Junction Protocols,* Publisher: Springer Science and Media. Editors: Mathieu Vinken and **Scott R. Johnstone**. *Methods Mol Biol.* 1437: 97-111; 2016. PMID: 27207289

Editorials:

35. **Scott R. Johnstone**. Going against the flow: the connexin connection in hypertension. Hypertension. 65(3):502-4; 2015. PMID: 25547340
36. **Scott R. Johnstone**, Catherine S, Wright and Patricia E Martin. Overview of the 8th Gap Junction meeting. *Biochemical Society Transactions*. 43:447-449, 2015. PMID: 26009189
37. **Scott R. Johnstone** and Brant E. Isakson. 'Gaps' in targeted ischemic injury therapies in STEMI. *Heart.* 0:1-2; 2018. PMID: 2902882
38. Leigh Anne Swayne, **Scott R Johnstone**, Chen Seng Ng, Juan C Sanchez-Arias, Miranda E Good, Silvia Penuela, Alexander W Lohman, Abigail G Wolpe, Victor E Laubach, Michael Koval, Brant E Isakson. Consideration of Pannexin 1 Channels in COVID-19 Pathology and Treatment. Am J Physiol Lung Cell Mol Physiol. 2020 Jul 1;319(1):L121-L125. PMID: 32519892