

# Juan C. Sanchez-Arias

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*Research Interests include:* Translational Research, Dendritic Spine Plasticity, Synapse and Neuronal Network Formation, and CNS & PNS Endogenous Repair Mechanisms.

## Education

### Academic Qualifications.....

- **PhD in Neuroscience** **University of Victoria**  
Victoria, BC. Canada 2015–2020 (expected)
  - Dissertation title (tentative): *Pannexin 1 regulates cortical dendritic spine formation*
  - GPA: 8.2/9.0
- **Doctor of Medicine** **Universidad del Valle**  
Cali, Valle. Colombia 2007–2014
  - Internship: Hospital Universitario del Valle ESE - Universidad del Valle. Cali, Valle. Colombia.
  - Observership: Functional Neurosurgery. Department of Neurosurgery. University of Illinois Hospital. Chicago, IL. USA
  - Research Internship: Centro de Estudios Cerebrales (Centre for Brain Studies). Universidad del Valle
    - Area of study: Cerebral cortex cytoarchitectonics diffuse traumatic brain injury models, MCAO model in rats.
  - Professional elective: Neurosurgery and Neurocritical care. Department of Neurosurgery. Hospital Universitario del Valle ESE - Universidad del Valle. Cali, Valle. Colombia
  - GPA: 4.4/5.0

### Relevant Coursework.....

- **University of Victoria**  
Developmental neurobiology, Tools for the study of ion channels.
- **Universidad del Valle**  
Functional Neuroanatomy, Cerebral cortex cytoarchitectonics, Scientific Integrity, Bio-statistics, Addictions and Pharmacodependence, Systems Pathology

## Technical and Personal skills

- **Laboratory skills:** Confocal microscopy, Live cell microscopy, , Cell culture (HEK cells, N2a cells, primary cortical neurons), Transfection in cell lines, Immunohistochemistry and Immunocytochemistry, Brain sectioning (vibrotome, cryostat), Mouse handling (advanced), Photothrombotic stroke induction, Transgenic mouse colony management.
- **Software:** MS Office products (Advanced), GraphPad (Advanced), Adobe Creative Suite (Advanced), ImageJ (Advanced), MATLAB (Beginner).
- **Languages:** English (Fluent). Spanish (Native).

- **Programming language:** R (Intermediate),  $\text{\LaTeX}$ (Intermediate), Markdown (intermediate), HTML (Intermediate), MATLAB (Beginner).

## Research experience

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- **Graudate Fellow** **University of Victoria**  
2015–present  
Victoria, BC. Canada
  - Advisor: Dr. Leigh Anne Swayne, PhD.
  - Area of study: Pannexin channels, dendritic spine and synapse formation.
    - *In vivo*: Generation of conditional knockouts (Cre-Lox system), brain sectioning, immunohistochemistry, lipophilic dye tracing, sensorimotor behavioural testing. *Model*: Mouse
    - *In vitro*: Cell culture (lines and primary), transfection, immunocytochemistry.
    - *Imaging*: Confocal microscopy, live cell microscopy,  $\text{Ca}^{2+}$  imaging
- **Research Intern in Biomedical Sciences-Neuroscience Concentration** **Universidad del Valle**  
Jan-July, 2014  
Cali, Valle. Colombia
  - Advisor: Prof. Martha Escobar, MSc; Prof. Hernan Pimienta, MSc; Prof. Efrain Buritica, PhD.
  - Area of study: Cerebral cortex, traumatic brain injury, stroke, neuroprotection
    - *In vivo*: Severe diffuse traumatic brain injury models, organotypic slice culture, evaluation of the neuroprotective properties of metformin in stroke using a MCAO model. Microsurgery in rats, carotid artery dissection and ligation. Immunohistochemistry *Model*: rats.
- **Research Elective** **Universidad del Valle**  
2010–2011  
Cali, Valle. Colombia
  - Advisor: Dr. Enrique A. Estevez, MD; Dr. Elsa P. Muñoz, MD, MPH
  - Area of study: Cardiovascular risk factor assessment in spinal cord injured patient assisting to a tertiary-level hospital.
    - *Research*: Creation of databases, study design, data recording, data management, statistical analysis.
    - *Clinical*: Neurological evaluation of patients with spinal cord injury, spasticity assessment, rehabilitation prescription, follow-up and ancillary tests (X-rays, CT scans, MRI, kidney and bladder function), case discussion with attendings and residents.

## Teaching experience

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- **Foundations of Medical Practice II** **Island Medical Program - University of British Columbia**  
2017–2018  
Victoria, BC. Canada
  - MEDD412 - Neuroanatomy Lab on Cranial Nerves V & VII and Pain (Year 1)
  - MEDD412 - Neuroanatomy Lab on Eye Movements and Brainstem (Year 1)
  - MEDD421 - Neuroanatomy Lab on Cerebral Cortex, Functional Areas, and Blood Supply (Year 2)
  - MEDD421 - Neuroanatomy Lab on Control of Movement and Cerebellum (Year 2)
  - MEDD422 - Neuroanatomy Lab on Limbic System/Dementia (Year 2)

## Awards

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- University of Victoria Fellowship Award Jan-Aug, 2015
- University of Victoria Student Travel Grant March, 2016
- University of Victoria Graduate Award 2015, 2017, 2018
- James A. & Laurette Agnew Memorial Scholarship & Award 2015, 2016, 2017, 2018
- Vera Allen Travel Award for Medical Sciences 2016, 2017, 2018
- Donald Wagg Graduate Scholarship 2017, 2018
- BC Regenerative Medicine Travel Award 2018

## Publications

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- **Sanchez-Arias, J. C.**, Liu, M., Choi, C.S.W., Ebert, S.N., Brown, C.E., Swayne, L.A. (*in review*). Pannexin1 regulates network ensembles and dendritic spine formation in cortical neurons. *eNeuro*. eN-NWR-0503-18.
- Epp, A., Boyce, A.K.J., Ehbert, S.N., Wicki-Stordeur, L. E., **Sanchez-Arias, J. C.**, Swayne, L. A. (*in review*). A novel motif in the proximal C-terminus of Pannexin 1 regulates cell surface localization and lipid interactions. *Scientific Reports*. SREP-18-48959
- Xu, X., Wicki-Stordeur, L. E., **Sanchez-Arias, J. C.**, Liu, M., Weaver, M. S., Choi, C. S. W., Swayne, L. A. (2018). Probenecid Disrupts a Novel Pannexin 1-Collapsin Response Mediator Protein 2 Interaction and Increases Microtubule Stability. *Frontiers in Cellular Neuroscience*, 12, 124. PMID: 29867357 <https://doi.org/10.3389/fncel.2018.00124>
- Gunton A.N., **Sanchez-Arias, J. C.**, Carmona-Wagner E.O., Wicki-Stordeur L.E, Swayne L.A. (2017). Upregulation of inflammatory mediators in the ventricular zone after cortical stroke. *Proteomics Clinical Applications*. 2017 May 15. PMID: 28508575. <https://doi.org/10.1002/prca.201600092>
- **Sanchez-Arias, J. C.**, Wicki-Stordeur L.E., Swayne L.A. Perspectives on the role of Pannexin 1 in neural precursor cell biology. *Neural Regeneration Research*. 2016 Oct;11(10):1540-1544. Pubmed ID: 27904473. <http://doi.org/10.4103/1673-5374.193221>
- Swayne L.A., **Sanchez-Arias, J. C.**, Agbay A., Willerth S.M. What are brain 'stem' cells, and why are they important?. 2016. *Frontiers for Young Minds*. 4:20. <http://doi.org/10.3389/frym.2016.00020>
- Wicki-Stordeur, L.E., **Sanchez-Arias, J. C.**, Dhaliwal, J., Carmona-Wagner, E.O., Shestopalov, V.I., Lagace, D.C., Swayne, L.A. (2016). Pannexin 1 Differentially Affects Neural Precursor Cell Maintenance in the Ventricular Zone and Peri-Infarct Cortex. *Journal of Neuroscience*, 27 January 2016, 36 (4) 1203-1210. Pubmed ID: 26818508. <https://doi.org/10.1523/JNEUROSCI.0436-15.2016>

## Patent

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- Swayne, L.A., **Sanchez-Arias, J. C.**, Wicki-Stordeur, L.E. Provisional Patent application: COLLAPSIN RESPONSE MEDIATOR 2 (CRMP2) PEPTIDES FOR TREATMENT OF NEUROLOGICAL DISORDERS. No. 62/767,806. Filed November 15, 2018.

## Oral presentations

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- The developing brain: a shape-shifting powerhouse. UVic Center for Biomedical Research Cafe Scientifique. Hermann's Jazz Club. March 19<sup>th</sup>, 2019. Victoria, BC. Canada.
- Near-death experiences: The mind *in extremis*. Night Shift: After life. Royal BC Museum. October 27<sup>th</sup>, 2018. Victoria, BC. Canada.
- Pannexin 1 regulates cortical dendritic spine formation. University of Victoria, Neuroscience Graduate Program Kick-Off. September 14<sup>th</sup>, 2018. Victoria, BC. Canada.
- Pannexin 1 in neuronal development. First BC Regenerative Medicine Symposium. May 10<sup>th</sup>, 2017. Vancouver, BC. Canada.

## Poster Presentations

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- **Sanchez-Arias, J. C.**, Shevtsova O., Liu M., Swayne L.A. Pannexin 1 regulates somatosensory pyramidal neuron dendritic spine density and sensorimotor function. Neuroscience 2018 (SfN 2018). San Diego Convention Center, San Diego, CA. November 3-7, 2018. Poster presentation.
- **Sanchez-Arias, J. C.**, Shevtsova O., Liu M., Weaver M.S., Swayne L.A. Pannexin 1: a novel regulator of dendritic spine development in the postnatal cerebral cortex. Canadian Association for Neuroscience Annual Meeting 2018. May 13-16, 2018. Vancouver, BC, Canada. Poster presentation.
- **Sanchez-Arias, J. C.**, Shevtsova O., Liu M., Weaver M.S., Swayne L.A. Pannexin 1: a novel regulator of dendritic spine development in the postnatal cerebral cortex. BC Regenerative Medicine Symposium. May 9, 2018. Vancouver, BC, Canada. Poster presentation.
- **Sanchez-Arias, J. C.**, Wicki-Stordeur L. E., Swayne L. A. A novel negative regulator of neurite development in the cerebral cortex. BC Regenerative Medicine Symposium, May 10, 2017. Vancouver, BC, Canada.
- **Sanchez-Arias, J. C.**, Wicki-Stordeur L. E., Swayne L. A. Wicki-Stordeur L.E, Swayne L.A. A pannexin 1 blocker modulates the development of dendritic spines in the postnatal cerebral cortex. Inaugural UVA Pannexin Conference. October 29, 2016. Charlottesville, VA, USA. Poster presentation.
- **Sanchez-Arias, J. C.**, Wicki-Stordeur L. E., Swayne L. A. A pannexin 1 blocker modulates the development of dendritic spines in the postnatal cerebral cortex. Neuroscience 2016 (SfN 2016). San Diego Convention Center, San Diego, CA. November 12-16, 2016. Poster presentation. Poster presentation.
- **Sanchez-Arias, J. C.**, Wicki-Stordeur L. E., Carmona-Wagner E. O., Swayne L. A. A Pannexin 1 blocker modulates dendrite formation in the early postnatal cerebral cortex. (Canadian Developmental Biology Conference 2016 – Satellite Symposium on Forebrain Neurogenesis: From Embryo to Adult. March 16-17, 2016. Banff, AB, Canada. Poster presentation.
- **Sanchez-Arias, J. C.**, Wicki-Stordeur L. E., Carmona-Wagner E. O., Dhaliwal J, Gunton A, Kim M. S, Boyce A. K. J., Shestopalov V. I., Lagace D. C., Swayne L. A. Investigation of Pannexin 1 in the response of developing neurons to stroke. Canadian Association for Neuroscience Annual Meeting 2015. May 24-27, 2015. Vancouver, BC, Canada.

## Service

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- BC Regenerative Medicine Symposium Organizing & Scientific Committee
- BC Regenerative Medicine Newsletter Co-editor
- Brain Bee Organizer - Victoria Chapter
- University of Victoria - Division of Medical Sciences Student Representative
- Neuroscience Graduate Program Kick-Off - Organizing Committee
- Let's Talk Science UVic Volunteer

## Society Memberships

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- Society for Neuroscience
- Canadian Association for Neuroscience
- BC Regenerative Medicine Initiative Trainee Steering Committee

## References

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- Available upon request