

# Juan C. Sanchez-Arias

PHD CANDIDATE · NEUROSCIENCE

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*"Any man could, if he were so inclined, be the sculptor of his own brain." Santiago Ramon y Cajal*

## Education

### University of Victoria

Victoria, BC, Canada

#### PHD IN NEUROSCIENCE

Jan. 2015 - April. 2020

- **Dissertation:** Pannexin 1 regulates dendritic spine formation.
- **GPA:** 8.2/9.0.
  - **Relevant Coursework:** Developmental neurobiology, Tools for the study of ion channels.

### Universidad del Valle - School of Medicine

Cali, Valle, Colombia

#### DOCTOR OF MEDICINE

Aug. 2007 - Oct. 2014

- **Pre-Diploma Rotatory Internship:** Hospital Universitario del Valle ESE - Universidad del Valle. Cali, Valle, Colombia.
- **Research Internship:** Centro de Estudios Cerebrales (Centre for Brain Studies). Universidad del Valle. Cali, Valle, Colombia
  - **Area of study:** Cerebral cortex cytoarchitectonics, functional neuronatomy, diffuse traumatic brain injury and ischemic stroke models in rats. Supervisors: Prof. Hernan Pimienta, Prof. Marhta Escobar, and Prof. Efrain Buritica.
- **Observership:** Functional Neurosurgery. Department of Neurosurgery. University of Illinois Hospital & Health Sciences System. University of Illinois at Chicago. Chicago, IL. USA. Supervisor: Dr. Konstantin Slavin.
- **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:** Functional Neuroanatomy, Cerebral cortex cytoarchitectonics, Scientific Integrity, Bio-statistics, Addiction and Pharmacology, Systems Pathology

## Skills

### Research

Project management, experimental design, data management, statistical analysis and modeling, scientific writing, delivery of reports and presentation of results to specialized and lay audiences.

### Laboratory

Confocal and Stimulated-emission-depletion (STED, super-resolution) microscopy, live cell microscopy, cell culture and transfection (cell lines and primary neurons), immunocyto(histo)chemistry, transgenic mouse colony management and generation of conditional knockouts (Cre-Lox), rodent surgery (stroke induction and viral vector injection), rodent behavioural testing

### Programming

R, Python, ImageJ Macro Language (IJM), HTML, Markdown,  $\LaTeX$

### Software

Microsoft Office Suite, Adobe Creative Suite, GraphPad, ImageJ/FIJI, MATLAB, RStudio

### Languages

English (fluent), Spanish (native)

## Research Experience

### University of Victoria

Victoria, BC, Canada

#### GRADUATE FELLOW IN NEUROSCIENCE

Jan. 2015 - Apr. 2020

- Advisor: Leigh Anne Swayne, PhD.
- Area of Study: Area of study: Pannexin 1 channels, dendritic spine plasticity, synapse formation, channel trafficking, neuronal cytoskeleton dynamics, neural stem cells, advanced microscopy for cell biology.
  - \* Generated conditional and conditional-inducible knockout models for the study of cerebral cortex development.
  - \* Optimized protocols to generate primary neuronal cultures from neonatal mice suitable for network analysis.
  - \* Developed methods to visualize dendritic spines and filopodia in tissue sections and living primary neurons.
  - \* Established immunocyto(histo)chemistry protocols that preserve the neuronal cytoskeleton.

## Centro de Estudios Cerebrales - Universidad del Valle

RESEARCH INTERN IN BIOMEDICAL SCIENCES - NEUROSCIENCE CONCENTRATION

Cali, Valle, Colombia

Feb. 2014 - Jun. 2014

- Advisors: Prof. Martha Escobar, MSc; Prof. Hernan Pimienta, MSc, Prof. Efrain Buritica, PhD.
- Area of study: functional neuroanatomy, cerebral cortex organization, traumatic brain injury, stroke, neuroprotection.
- Performed carotid ligation in Whistar rats using microsurgery techniques.
- Used the weight-drop model of diffuse traumatic brain injury to generate organotypic slice cultures from rats.
- Optimized immunohistochemistry for neuronal and astrocytic markers in thick rat brain tissue sections.

## School of Public Health - Universidad del Valle

STUDENT RESEARCHER

Cali, Valle, Colombia

Aug. 2010 - Feb. 2011

- Advisors: Enrique A. Estevez, MD and Elsa P. Muñoz, MD, MPH
- Area of study: Cardiovascular risk factor assessment in spinal cord injured patient assisting to a tertiary-level hospital.
  - Prepared research project proposal, liaised with ethical boards, and established a network of collaborators to complete using a standardized survey.
  - Prepared reports and presentations to share project results in local and national meetings.
  - Created a database in EpiInfo 7 for data collection, data management, and statistical analysis.
  - Contributed to the assessment and management of patients with chronic spinal cord injury, including prescribing rehabilitation plans and ordering of radiological and laboratory ancillary tests. Discussed cases with Physical Medicine and Rehabilitation attendings and residents.

## Teaching Experience

### University of Victoria - Division of Medical Sciences

TEACHING ASSISTANT

Victoria, BC, Canada

Spring 2017, Fall 2018, Spring 2020

- Course: Foundations of Medical Practice I and II
- Program: Island Medical Program - University of British Columbia
  - \* MEDD412 - Neuroanatomy Bootcamp #1 (Year 1).
  - \* 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).

## Service & Leadership

### BC Regenerative Network (BCREGMED)

TRAINEE STEERING COMMITTEE

Victoria & Vancouver, BC, Canada

Feb. 2017 - PRESENT

- Co-editor for the BC Regenerative Medicine Network Newsletter.
- Member of the BCREGMED Symposium Organizing and Scientific committee.

### CIHR Brain Bee - Victoria Chapter

ORGANIZER

Victoria, BC, Canada

2017 - PRESENT

- Organized and coordinated social media for the Victoria Brain Bee. Mentored high school students from the Greater Victoria Area who participated in the Brain Bee competition.
- Secured funding to sponsor Victoria Brain Bee winners traveling to the CIHR National Brain Bee.

### Neuroscience Graduate Student Association (NGSA)

STUDENT MEMBER

Victoria & Vancouver, BC, Canada

2017 - PRESENT

- Student Representative - Division of Medical Sciences.
- Member of the Organizing Committee for the Neuroscience Graduate Program Kick-Off. Liased and recruited keynote speakers for seminar lectures.

### Let's Talk Science - UVic

VOLUNTEER

Victoria, BC, Canada

Oct 2018 - PRESENT

- Involved in Neuroscience Outreach talks and high school science excursions at the University of Victoria - Division of Medical Sciences.

### Lecturio GmbH

FREELANCE MEDICAL WRITER

Leipzig, Germany

Jun. 2017 - Oct. 2018

- Produced, edited and copyedited medical exam- and licensing exam-like questions (USMLE Step1 and Step 2CK style questions).

### UVic's Women in Science

VOLUNTEER

Victoria, BC, Canada

Jan. 2020 - PRESENT

- Involved in the Peer-Mentorship Program as Graduate Mentor.

## Honors & Awards

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International Gap Junction Conference NB Gilula Star Award, 2019	IGJC2019
John & Myrtle Tilley Graduate Scholarship, 2019	UVic-FGS
BC Regenerative Medicine Travel Award, 2018	BCREGMED
Donald Wagg Graduate Scholarship, 2017 2018	UVic-FGS
Vera Allen Travel Award for Medical Sciences, 2016 2017 2018 2019	UVic-FGS
University of Victoria Student Travel Grant, 2016	UVic-FGS
James A. & Laurette Agnew Memorial Scholarship & Award, 2015 2016 2017 2018 2019	UVic-FGS
University of Victoria Graduate Award, 2015 2017 2018 2019	UVic-FGS
University of Victoria Fellowship Award, 2015	UVic-FGS
Universidad del Valle - School of Medicine Dean's List, 2007 2009 2013 2014	UniValle
Public High School Academic Excellence Scholarship, 2006	InfValle-Colombia

## Publications

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### JOURNAL ARTICLES

- Ankyrin-B p.S646F undergoes increased proteasome degradation and reduces cell viability in the H9c2 rat ventricular cardiomyoblast cell line  
Lena Chen, Catherine S. W. Choi, **Juan C. Sanchez-Arias**, Laura T. Arbour, Leigh Anne Swayne  
*Biochemistry and Cell Biology* (DEC. 2019). DOI: 10.1139/BCB-2019-0082
- Ankyrin B and Ankyrin B variants differentially modulate intracellular and surface Cav2.1 levels  
Catherine S. W. Choi, Ivana A. Souza, **Juan C. Sanchez-Arias**, Gerald W. Zamponi, Laura T. Arbour, Leigh Anne Swayne  
*Molecular Brain* 12.1 (SEPT. 2, 2019) P. 75. DOI: 10.1186/s13041-019-0494-8
- A novel motif in the proximal C-terminus of Pannexin 1 regulates cell surface localization  
Anna L. Epp, Sarah N. Ebert, **Juan C. Sanchez-Arias**, Leigh E. Wicki-Stordeur, Andrew K. J. Boyce, Leigh Anne Swayne  
*Scientific Reports* 9.1 (JULY 5, 2019) P. 9721. DOI: 10.1038/s41598-019-46144-5
- Exploring the Pannexin 1 interactome: In silico cross-analyses with postsynaptic proteins and neuropsychiatric disorder susceptibility genes  
Simona D. Frederiksen, Leigh E. Wicki-Stordeur, **Juan C. Sanchez-Arias**, Leigh Anne Swayne  
*bioRxiv* (OCT. 11, 2019) P. 801563. DOI: 10.1101/801563
- Pannexin 1 Regulates Network Ensembles and Dendritic Spine Development in Cortical Neurons  
**Juan C. Sanchez-Arias**, Mei Liu, Catherine S. W. Choi, Sarah N. Ebert, Craig E. Brown, Leigh Anne Swayne  
*eNeuro* 6.3 (MAY 22, 2019) ENEURO.0503-18.2019. DOI: 10.1523/ENEURO.0503-18.2019
- Probenecid Disrupts a Novel Pannexin 1-Collapsin Response Mediator Protein 2 Interaction and Increases Microtubule Stability  
Xiaoxue Xu, Leigh E. Wicki-Stordeur, **Juan C. Sanchez-Arias**, Mei Liu, Maria S. Weaver, Catherine S. W. Choi, Leigh A. Swayne  
*Frontiers in Cellular Neuroscience* 12 (MAY 11, 2018). DOI: 10.3389/FNCEL.2018.00124
- Upregulation of inflammatory mediators in the ventricular zone after cortical stroke  
Adrianna N. Gunton, **Sanchez-Arias, Juan C.** Esther O. Carmona-Wagner, Leigh E. Wicki-Stordeur, Leigh Anne Swayne  
*PROTEOMICS - Clinical Applications* 11.9 (MAY 15, 2017) P. 1600092. DOI: 10.1002/PRCA.201600092
- Perspectives on the role of Pannexin 1 in neural precursor cell biology  
**Juan C. Sanchez-Arias**, Leigh E. Wicki-Stordeur, Leigh Anne Swayne  
*Neural Regeneration Research* 11.10 (NOV. 4, 2016) PP. 1540-1544. DOI: 10.4103/1673-5374.193221
- What Are Neural Stem Cells, and Why Are They Important?  
Leigh Anne Swayne, **Juan C. Sanchez-Arias**, Andrew Agbay, Stephanie M. Willerth  
*Frontiers for Young Minds* 4.20 (SEPT. 22, 2016) P. 7. FRONTIERS, DOI: 10.3389/FRYM.2016.00020
- Pannexin 1 Differentially Affects Neural Precursor Cell Maintenance in the Ventricular Zone and Peri-Infarct Cortex  
Leigh E. Wicki-Stordeur, **Juan C. Sanchez-Arias**, J. Dhaliwal, Esther O. Carmona-Wagner, Valery I. Shestopalov, Diane C. Lagace, Leigh Anne Swayne  
*Journal of Neuroscience* 36.4 (JAN. 27, 2016) PP. 1203-1210. DOI: 10.1523/JNEUROSCI.0436-15.2016

## Presentations

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### ORAL PRESENTATIONS

## International Gap Junction Conference

Star Award Talk: PANNEXIN 1 REGULATES NEURONAL NETWORKS AND DENDRITIC SPINE FORMATION IN CORTICAL NEURONS

Victoria, BC, Canada

July 27-31, 2019

## University of Victoria - Neuroscience Graduate Program Kick-Off

PANNEXIN 1 REGULATES CORTICAL DENDRITIC SPINE FORMATION

Victoria, BC, Canada

September 14, 2018

## BC Regenerative Medicine Symposium

PANNEXIN 1 IN NEURONAL DEVELOPMENT

Vancouver, BC, Canada

May 10, 2017

## XV Health Sciences Research Symposium: Disability and Life Cycle - Universidad del Valle

BEHAVIOURAL RISK FACTORS ASSOCIATED WITH CARDIOVASCULAR DISEASE IN CHRONIC SPINAL CORD INJURY

Cali, Colombia

Oct. 14, 2013

## XXI Colombian Student's Congress of Medical Research (CECIM)

A PILOT FOR THE ASSESSMENT OF BEHAVIOURAL RISK FACTORS ASSOCIATED WITH CARDIOVASCULAR DISEASE IN SPINAL CORD INJURY

Bucaramanga, Colombia

May. 5, 2010

## POSTER PRESENTATIONS

Pannexin 1 regulates network ensembles and dendritic spine development in cortical somatosensory neurons

**Juan C. Sanchez-Arias**, Mei. Liu, Catherine S.W. Choi, Sarah N. Ebert, Ana DeLucas-Rius, Craig E. Brown, Leigh Anne Swayne

Canadian Association for Neuroscience Meeting, 2019, May, Toronto, ON, Canada

Pannexin 1 regulates neuronal networks and dendritic spine formation in cortical neurons

**Juan C. Sanchez-Arias**, Mei. Liu, Catherine S.W. Choi, Sarah N. Ebert, Ana DeLucas-Rius, Craig E. Brown, Leigh Anne Swayne

International Gap Junction Conference, 2019, July, Victoria, BC, Canada

Pannexin 1: a novel regulator of dendritic spine development in the postnatal cerebral cortex

**Juan C. Sanchez-Arias**, Olga Shetsova, Mei Liu, Weaver Maria S. Leigh Anne Swayne

BC Regenerative Medicine Symposium, 2018, May, Vancouver, BC, Canada

Pannexin 1: a novel regulator of dendritic spine development in the postnatal cerebral cortex

**Juan C. Sanchez-Arias**, Olga Shetsova, Mei Liu, Weaver Maria S. Leigh Anne Swayne

Canadian Association for Neuroscience Meeting, 2018, May, Vancouver, BC, Canada

Pannexin 1 regulates somatosensory pyramidal neuron dendritic spine density and sensorimotor function

**Juan C. Sanchez-Arias**, Olga Shetsova, Mei Liu, Leigh Anne Swayne

Society for Neuroscience Meeting, 2018, Nov., San Diego, CA, USA

A novel negative regulator of neurite development in the cerebral cortex

**Juan C. Sanchez-Arias**, Wicki-Stordeur Leigh E. Leigh Anne Swayne

BC Regenerative Medicine Symposium, 2017, May, Vancouver, BC, Canada

A pannexin 1 blocker modulates the development of dendritic spines in the postnatal cerebral cortex

**Juan C. Sanchez-Arias**, Wicki-Stordeur Leigh E. Carmona-Wagner Esther O. Leigh Anne Swayne

Canadian Developmental Biology Conference – Satellite Symposium on Forebrain Neurogenesis: From Embryo to Adult, 2016, Mar., Banff, AB, Canada

A pannexin 1 blocker modulates the development of dendritic spines in the postnatal cerebral cortex

**Juan C. Sanchez-Arias**, Wicki-Stordeur Leigh E. Leigh Anne Swayne

Inaugural University of Virginia Pannexin Conference, 2016, Oct., Charlottesville, VA, USA

A pannexin 1 blocker modulates the development of dendritic spines in the postnatal cerebral cortex

**Juan C. Sanchez-Arias**, Wicki-Stordeur Leigh E. Leigh Anne Swayne

Society for Neuroscience Meeting, 2016, Nov., San Diego, CA, USA

## Science Communication

### BC Regenerative Medicine Network Newsletter

EDITOR & WRITER

BCREGMED

2018 - PRESENT

- Contributor to the Translational Research Highlights Section

### Neuroscience Graduate Program TEDx Series

SPEAKER

Victoria, BC, Canada

Oct. 31, 2019

- Talk title: Your brain is like play-dough on superpowers, so play with it!

### Cafe Scientifique - UVic Centre for Biomedical Research

SPEAKER

Victoria, BC, Canada

Mar. 19, 2019

- Talk title: The developing brain: a shape-shifting powerhouse

- Talk title: Near-death experiences: The mind *in extremis*

## Society Membership

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Active	Student Member, Canadian Association for Neuroscience	2015 - Present
Active	Student Member, Society for Neuroscience	2016 - Present
Active	Member, Trainee Steering Committee - BC Regenerative Medicine Network	2017 - Present