

CURRICULUM VITAE

Name: Juan C. Sáez, Ph.D.
Birthday: February 2, 1956
Citizenship: Chilean.

DEGREES:

Ph.D. in Neuroscience, Albert Einstein Coll. Med., Yeshiva Univ., Bronx, N.Y. (1983-1986).
Biochemist (equivalent to MS in Biochemistry), Univ. de Concepción, Concepción. Chile (1974-1979).

ACADEMIC POSITIONS:

2018-present. Professor, Neuroscience Institute, Univ. de Valparaíso, Chile.
2004-2021. Professor, Dept. Physiology, Pontificia Univ. Católica de Chile (PUCC), Santiago, Chile.
2007-present. Visiting Professor, Dept. Neuroscience, Albert Einstein Coll. Medicine (AECOM), Yeshiva Univ, Bronx, NY, USA.
1994-2007: Visiting Associate Professor, Dept. Neuroscience, AECOM, Yeshiva Univ, Bronx, NY, USA.
1994-2004: Associate Professor, Dept. Physiology, PUCC, Santiago, Chile.
1993-1994: Assistant Professor, Dept. Physiology, PUCC, Santiago, Chile.
1989-1993: Assistant Professor, Dept. Neuroscience, AECOM, Yeshiva Univ., Bronx, N.Y., USA.
1987-1989: Instructor, Dept. Neuroscience, AECOM, Yeshiva Univ., Bronx, N.Y., USA.
1986-1987: Post-doctoral fellow, Dept. Neuroscience, AECOM, Yeshiva Univ., Bronx, N.Y., USA.
1979-1983: Instructor, Dept. Physiology, Univ. de Concepción, Chile.

ADMINISTRATIVE POSITIONS:

2019-present. Member of the Human Capital Training Advisory Committee ANID.
2018-2019. Honorary Professor in the School of Public Health of the University of Hong Kong.
2017-present. Deputy Director of the Neuroscience Interdisciplinary Center of Valparaíso.
2015-2021. Coordinator of Master, Doctorate and Post-doctorate scholarships in Physiology and Biochemistry. CONICYT.
2013-2019. Committee member of the Ph.D. program in Neuroscience. Pontificia Univ. Católica de Chile, Santiago, Chile.
2003-2014. Director of the Ph.D. Program in Physiological Sciences. Pontificia Univ. Católica de Chile, Santiago, Chile.
2009-2019. Subdirector of the Center for Neuroscience, Pontificia Universidad Católica de Chile.

AWARDS AND DISTINCTIONS:

2021 Member of the Advisory Board of the Universal Scientific Education and Research Network (USERN) for three years from April 2021.
2019. International Member of the National Academy of Science (NAS) USA.
2017. Academic Member of the Latin American Academy of Science (ACAL).
2017. Outstanding work in the field of transfer of research results, Directorate of Transfer and Development of the Vice-rectory for Research.
2014. Winner of the VII UC Patent Contest. "Identification, compositions and therapeutic uses of heterocyclic blockers of hemichannels formed by connexins".
2010. Winner of the II Competition of Intellectual Property, Pontificia Universidad Católica de Chile

2008. Chilean **Scopus price** given by Elsevier Editorial. The Chilean Scientist with the highest productivity and impact in Pharmacology, Biochemistry, Genetics and Molecular Biology.

1993, Glaxo Research Institute. Fellowship Award.

1987, Grass Fellowship to work as independent Scientist at the Marine Biological Laboratory.

1980, Best Thesis work of the year given by the Society of Pharmacists and Biochemists of Concepción.

MEMBERSHIP OF SCIENTIFIC SOCIETIES:

1985-present Latin American Biophysical Society.

1990-1994 Biophysical Society

1990-2015 American Society for Cell Biology, USA

1994-present. Chilean Society for Physiology.

1994-present. Chilean Society for Biology.

1994-present. Chilean Society for Cell Biology.

2003-present. Chilean Society for Neuroscience.

2003-present. Free Radicals and Antioxidants Group-Chile.

2019-present. Society of General Physiology, USA

AD HOC EVALUATOR OF SCIENTIFIC JOURNALS:

Proceedings of the Academy of Science; Journal of Biological Chemistry; Journal of Cell Biology, Journal of Cell Physiology; American Journal of Physiology; Journal of Cell Science; Journal of Cell Biochemistry; Journal of Biological Chemistry; Journal of Immunology; FASEB J; BBA; BBRC; Journal of Neuroscience; Neuroscience; Journal of Neurochemistry; Glia; Journal of Neuroscience Research; Cell Calcium; Hepatology; Experimental Lung Res; Experimental Neurology.; Glia, Cell Adhesion and Communication; Journal of Cellular and Molecular Medicine; Journal of Experimental Medicine; Cardiovascular Research and Microvascular Res. Nature Reviews Rheumatology. Nature Metabolism; Science Signaling, eLife, Human Molecular Genetics; Nature Communication; Frontiers Cellular Neuroscience.

ORGANIZER OF SCIENTIFIC EVENTS

2020 Symposium on “Recent experimental designs to discover effective therapies to treat epilepsy”.
Chilean Soc. of Neuroscience 2020.

2018 Symposium on “Progress in epilepsy” Chilean Soc. of Biology/Chilean Soc. of Neuroscience 2018.

2018. Latin American Training Program, funded by Sfn and IBRO. Graduate students and post-doctoral fellows of Latin American countries attend a three weeks course in the CNIV-Valparaíso 2018 (Co-organized with A.D. Martínez).

2015. International Gap Junction Conference 2015 in Valparaíso-Chile (Co-organized with A.D. Martínez, Viviana M. Berthoud and Maria Dagli).

2015. Workshop; “Biophysic of hemichannels and gap junction channels: A theoretical and practical training”. Santiago Valparaíso, (Co-organized with A.D. Martínez and M.A. Retamal).

2013. Symposium, co-organized with Dr. AD Martínez: “Role and regulation of channels and hemichannels formed by connexin or pannexins in the nervous system” Reunión Annualde la Sociedad de Neurociencias de Chile, Valparaíso

2013. Symposium, co-organizer with AD. Martínez: “Cell Membrane Channels Made by Connexins or Pannexins are Key Players in Genetic and Acquired Diseases” presented during the XXVII Annual Meeting of the Chilean Society for Cell Biology. November, Pucón

2012. Workshop organizer: “Structure and function of connexin, pannexin and other cellular transporters. October 20-30, 2012, Valparaíso.

2012. Symposium organizer: “Intercellular communication via pannexin- and connexin-based channels in health and disease”. Chilean meeting of the Society for Cell Biology. October, 2012.

2011. Symposium organizer. "Regulation of glial connexin channels: from the nucleus to the membrane". Chilean congress of the Society for Physiology.
2009. Mini Symposium Organizer. "El SIDA como una enfermedad neurodegenerativa". Abril, 2009.
2006. Symposium Organizer. "Gap junction hemichannels and mechanisms that regulate their functional state under physiological and pathological conditions" 2ºCongress of the Chilean Society for Neuroscience, September, Curicó, Chile.
2006. Workshop Co-organizer with Dr. M. Villalón. "Regulation and function of free intracellular Ca²⁺ and intercellular Ca²⁺ waves", January, Santiago.
2003. Symposium Organizer. "Gap junction in the inflammatory response" del V Congreso Ibero Americano de Biofísica. Rio de Janeiro, Brasil.
2001. Workshop Organizer. "Chemical and electrical synapsis: theoretical and practical advances". Pontificia Univ. Católica de Chile, Santiago, Chile.
1995. Workshop Co-organized with Dr. Ramón Latorre. "From Ion Channels to Cell-to-Cell Conversations". CECS, Santiago, Chile.

REVIEW EDITOR

Frontiers in Neuroscience/Neuroenergetics
Frontiers in Physiology

PRESENTATIONS TO SCIENTIFIC MEETINGS

400 abstracts have been presented in different Chilean, South American and other International Meeting in USA, Canada, India, Japan, China and Europe.

PUBLICATIONS (WOS) (Google Scholar Total Citations =19.080, H= 70)

206. Arredondo C, Cefaliello C, Dyrda A, Jury N, Martinez P, Díaz I, Amaro A, Tran H, Morales D, Pertusa M, Stoica L, Fritz E, Corvalán D, Abarzúa S, Méndez-Ruette M, Fernández P, Rojas F, Kumar MS, Aguilar R, Almeida S, Weiss A, Bustos FJ, González-Nilo F, Otero C, Tevy MF, Bosco DA, **Sáez JC**, Kähne T, Gao FB, Berry JD, Nicholson K, Sena-Esteves M, Madrid R, Varela D, Montecino M, Brown RH, van Zundert B. (2022) Excessive release of inorganic phosphate by ALS/FTD astrocytes causes non-cell-autonomous toxicity to motoneurons. **Neuron**. 2022 Mar 3:S0896-6273(22)00148-9. doi: 10.1016/j.neuron.2022.02.010. Online ahead of print.
205. González-Jamett A, Vásquez W, Cifuentes-Riveros G, Martínez-Pando R, **Sáez JC**, Cárdenas AM. (2022) Oxidative Stress, Inflammation and Connexin Hemichannels in Muscular Dystrophies. **Biomedicines**. 10(2):507. doi: 10.3390/biomedicines10020507
204. Palacios-Prado N, Soto PA, López X, Choi EJ, Marquez-Miranda V, Rojas M, Duarte Y, Lee J, González-Nilo FD, **Sáez JC**. (2022) Endogenous pannexin1 channels form functional intercellular cell-cell channels with characteristic voltage-dependent properties. **Proc Natl Acad Sci U S A**. 119(18):e2202104119. doi: 10.1073/pnas.2202104119.
203. García-Rodríguez C, Bravo-Tobar ID, Duarte Y, Barrio LC, **Sáez JC**. (2021) Contribution of non-selective membrane channels and receptors in epilepsy. **Pharmacol Ther**. 231:107980. doi: 10.1016/j.pharmthera.2021.107980
202. Harcha PA, Garcés P, Arredondo C, Fernández G, **Sáez JC**, van Zundert B. (2021) Mast Cell and Astrocyte Hemichannels and Their Role in Alzheimer's Disease, ALS, and Harmful Stress Conditions. **Int J Mol Sci**. 22(4):1924. doi: 10.3390/ijms22041924.
201. Güiza J, García A, Arriagada J, Gutiérrez C, González J, Márquez-Miranda V, Alegría-Arcos M, Duarte Y, Rojas M, González-Nilo F, **Sáez JC**, Vega JL. (2021) Unnexins: Homologs of innexin proteins in Trypanosomatidae parasites. **J Cell Physiol**. 237(2):1547-1560. doi: 10.1002/jcp.30626
200. López X, Palacios-Prado N, Güiza J, Escamilla R, Fernández P, Vega JL, Rojas M, Marquez-Miranda V, Chamorro E, Cárdenas AM, Maldifassi MC, Martínez AD, Duarte Y, González-Nilo FD, **Sáez JC**. (2021) A

- physiologic rise in cytoplasmic calcium ion signal increases pannexin1 channel activity via a C-terminus phosphorylation by CaMKII. **Proc Natl Acad Sci U S A.** 118(32):e2108967118. doi: 10.1073/pnas.2108967118.
199. Wang Y, Su Y, Yu G, Wang X, Chen X, Yu B, Cheng Y, Li R, **Sáez JC**, Yi C, Xiao L, Niu J. (2021) Reduced Oligodendrocyte Precursor Cell Impairs Astrocytic Development in Early Life Stress. **Adv Sci (Weinh).** 8(16):e2101181. doi: 10.1002/advs.202101181
198. Güiza J, Arriagada J, Rodríguez L, Gutiérrez C, Duarte Y, **Sáez JC**, Vega JL. (2021) Anti-parasitics drugs that modulates non-selective channels formed by connexins or pannexins. **Biochim Biophys Acta Mol Basis Dis.** 2021 Jun 5:166188. doi: 10.1016/j.bbadis.2021.166188. Online ahead of print.
197. Bravo-Tobar ID, Fernández P, **Sáez JC**, Dagnino-Subiabre A. Long-Term Effects of Stress Resilience: Hippocampal Neuroinflammation and Behavioral Approach in Male Rats. **J. Neurosci Res** 99(10):2493-2510. doi: 10.1002/jnr.24902
196. Salgado M, García-Robles MÁ, **Sáez JC**. Purinergic signaling in tanycytes and its contribution to nutritional sensing. **Purinergic Signal.** (2021) 17(4):607-618. doi: 10.1007/s11302-021-09791-w
195. Harcha PA, Garcés P, Arredondo C, Fernández G, **Sáez JC**, van Zundert B. (2021) Mast Cell and Astrocyte Hemichannels and Their Role in Alzheimer's Disease, ALS, and Harmful Stress Conditions. **Int J Mol Sci.** 22(4):1924. doi: 10.3390/ijms22041924.
194. Recabal A, Fernández P, López S, Ordenes P, Elizondo R, Farkas C, Uribe E, Caprile T, **Sáez JC**, García-Robles MA. (2021) FGF2-induced tanycyte proliferation involves a connexin 43-hemichannel/purinergic pathway. **J. Neurochem.** 156(2):182-199. doi: 10.1111/jnc.15188.
193. Giaume C., Naus C, **Sáez JC**, Leybaert L.(2021) Glial connexins and pannexins in healthy and diseased brain. **Physiol Rev** 101(1):93-145. 10.1152/physrev.00043.2018
192. Choi EJ, Palacios-Prado N, Sáez JC, Lee J. (2020) Confirmation of Connexin45 Underlying Weak Gap Junctional Intercellular Coupling in HeLa Cells. **Biomolecules.** 10(10):E1389. doi: 10.3390/biom10101389.
191. López X, Escamilla R, Fernández P, Duarte Y, González-Nilo F, Palacios-Prado N, Martínez AD, Sáez JC (2020) Stretch-induced activation of pannexin 1 channels can be prevented by PKA-dependent phosphorylation. **Int J Molec Sci** 21(23):E9180. doi: 10.3390/ijms21239180.
190. Choi EJ, Palacios-Prado N, **Sáez JC**, Lee J. Identification of Cx45 as a major component of gap junctions in HeLa cells. **Biomolecules.** (2020) 10(10):E1389. doi:10.3390/biom10101389
189. Cea LA, Fernández G, Arias GB, Castillo-Ruiz M, Brañes MC, **Sáez JC**. Blockade of hemichannels normalizes the differentiation fate of myoblasts and features of skeletal muscles from dysferlin-deficient mice. **Int J Molec Sci.** (2020) 21(17):E6025.
188. Balboa E., Saavedra F., Cea L.A., Ramírez V., Escamilla R., Vargas A., Regueira R., **Sáez J.C.** Vitamin E blocks connexin hemichannels and prevents deleterious effects of glucocorticoid treatment on skeletal muscles. **Int. J. Molec. Sci.** (2020) 21(11):E4094.
187. **Sáez J.C.**, Vargas A.A., Ortiz F.C., D.E., Giaume C., Orellana J.A. Permeation of molecules through astroglial connexin 43 hemichannels is modulated by cytokines with parameters depending on the permeant species. **Int. J. Molec. Sci.** (2020) 21(11):E3970.
186. Fernández G., Arias G.B., Bevilacqua J.A., Castillo M., Caviedes P, **Sáez J.C.**, Cea L.A. Myofibers deficient in connexins 43 and 45 expression protect mice from skeletal muscle and systemic dysfunction promoted by a dysferlin mutation. **Biochem. Biophys. Acta- Molecular Basis of Disease** (2020) 1866 (8) 165800.
185. **Sáez J.C.**, Contreras-Duarte S., Labra V.C., Santibañez C.A., Mellado L.A., Inostroza C.A., Alvear T.F., Retamal M.A., Velarde V., Orellana J.A. Interferon- γ and high glucose-induced opening of Cx43 hemichannels causes endothelial cell dysfunction and damage. **Biochem. Biophys. Acta. Molecular Cell Research** 14:1867(8):118720 (2020).
184. Cisterna CB., Vargas A.A., Puebla C., Lagos C.F., Escamilla R., Matus M-F., Vilos C., Cea L.A., Barnafi E., Gaete H., Escobar D.F., Cardozo C., **Sáez J.C.** Active acetylcholine receptors prevent the atrophy of skeletal muscles and favor reinnervation. **Nature Comm.** 11: 1073, (2020).

183. Li T, Niu J, Ezan P., Koulakoff A., Yi C., **Sáez JC**, Giaume C., Xiao L. The deletion of connexin 43 in astrocytes promotes CNS remyelination by inhibiting local inflammation. **Glia** 68(6):1201-1212 (2020).
182. Harcha PA., López X, Sáez PJ, Fernández P, Barría I, **Sáez JC**. Pannexin-1 channels are essential for mast cell degranulation triggered during Type I hypersensitivity reactions. **Frontiers Immunol**, 29 November 2019 <https://doi.org/10.3389/fimmu.2019.02703>.
181. Asencio-Barría C, Defamie N, **Sáez JC**, Mesnil M, Godoy AS. Direct Intercellular Communications and Cancer: A Snapshot of the biological roles of connexins in prostate Cancer. **Cancers** (Basel). 2019 Sep 14;11(9). pii: E1370.
180. Gómez GI, Velarde V, Sáez JC. Role of a RhoA/ROCK-Dependent Pathway on Renal Connexin43 Regulation in the Angiotensin II-Induced Renal Damage. **Int J Mol Sci**. 2019 Sep 7;20(18).
179. Eugenín EA, Valdebenito S, Gorska AM, Martínez AD, Bitran M, **Sáez JC**. (2019) Gap junctions coordinate the propagation of glycogenolysis induced by norepinephrine in the pineal gland. **J Neurochem**. 151(5):558-569. doi: 10.1111/jnc.14846
178. Cea LA, Balboa E, Vargas AA, Puebla C, Brañes MC, Escamilla R, Regueira T, **Sáez JC**. De novo expression of functional connexins 43 and 45 hemichannels increases sarcolemmal permeability of skeletal myofibers during endotoxemia. **Biochim Biophys Acta Mol Basis Dis**. 2019 Oct 1;1865(10):2765-2773.
177. Wellmann M, Álvarez-Ferradas C, Maturana CJ, **Sáez JC**, Bonansco C. Astroglial Ca²⁺ hyperactivity requires P2Y₁ purinergic receptors and pannexin-1 channel activation in a chronic model of epilepsy. **Frontiers Cell Neurosci**. 2018, Oct 11;9:1414.
176. **Sáez JC**, Contreras-Duarte S, Gómez GI, Labra VC, Santibañez C.A, Gajardo-Gómez R., Avendaño B.C., Díaz E.F., Montero T.D., Velarde V. Orellana JA. Connexin 43 hemichannel activity promoted by pro-Inflammatory cytokines and high glucose alters endothelial cell function. **Front Immunol**. 2018 Aug 15;9:1899.
175. Güiza J, Barría I, **Sáez JC**, Vega JL. Innexins: Expression, Regulation and Functions. **Front Physiol** 2018 Oct 11;9:1414.
174. Sáez PJ, **Sáez JC**., Lennon-Duménil A.-M., Vargas P. Role of calcium permeable channels in dendritic cell migration. **Current Opinion Immunol**. ;52:74-80 (2018).
173. Gómez GI, Fernández P, Velarde V, **Sáez JC**. Angiotensin II-Induced mesangial cell damage Is preceded by cell membrane permeabilization Due to Upregulation of Non-Selective Channels. **Int J Mol Sci**. 2018 Mar 23;19(4).
172. Sáez PJ, Vargas,P, Shoji KF, Harcha PA, Lennon-Duménil A-M, **Sáez JC**. ATP promotes the fast migration of dendritic cells through the activity of pannexin 1 channels and P2X₇ receptors. **Science Signaling** 2017 Nov 21;10(506). pii: eaah7107. doi: 10.1126/scisignal.aah7107.
171. Barría I, Güiza J., Cifuentes, F.; Zamorano, P.; Sáez, J.C.; González, J.; Vega, J.L. (2017) Trypanosoma cruzi infection induces pannexin-1 channel opening in cardiac myocytes. **Amer J Tropical Med & Hygiene** 98(1):105-112. doi: 10.4269/ajtmh.17-0293.
170. Giaume C, **Sáez JC**, Song W, Leybaert L, Naus CC. Connexins and pannexins in Alzheimer's disease. **Neurosci Lett**. 2017 Sep 8. pii: S0304-3940(17)30740-1.
169. Rovegno M, Sáez JC. Role of astrocyte connexin hemichannels in cortical spreading depression. **Biochim Biophys Acta-Biomembranes**. 2017 Aug 29. pii: S0005-2736(17)30264-X.
168. Yi C, Ezan P, Fernández P, Schmitt J, **Sáez JC**, Giaume C, Koulakoff A. Inhibition of glial hemichannels by boldine treatment reduces neuronal suffering in a murine model of Alzheimer's disease. **Glia**. 65(10):1607-1625 (2017).
167. Charvériat M, Naus CC, Leybaert L, **Sáez JC**, Giaume C. Connexin-Dependent Neuroglial Networking as a New Therapeutic Target. **Front Cell Neurosci**. 2017 Jun 26;11:174.
166. Plotkin LI, Davis HM, Cisterna BA, **Sáez JC**. Connexins and Pannexins in Bone and Skeletal Muscle. **Curr Osteoporos Rep**. 15(4):326-334 (2017).
165. Balboa E, Saavedra F, Cea LA, Vargas AA, Ramírez V, Escamilla R, **Sáez JC**, Regueira T.

- Sepsis-Induced Channelopathy in Skeletal Muscles is Associated with Expression of Non-Selective Channels. **Shock**. 49(2):221-228. (2018).
164. Vargas AA, Cisterna BA, Saavedra-Leiva F, Urrutia C, Cea LA, Vielma AH, Gutierrez-Maldonado SE, Martin AJ, Pareja-Barrueto C, Escalona Y, Schmachtenberg O, Lagos CF, Pérez-Acle T, **Sáez JC**. On Biophysical Properties and Sensitivity to Gap Junction Blockers of Connexin 39 Hemichannels Expressed in HeLa Cells. **Front Physiol**. 2017 Feb 9;8:38.
163. **Sáez JC**. Unravelling a novel mechanism for the up-regulation of connexin43 gap junctions between cells derived from the blood-brain barrier. **J Physiol**. 595(8):2411-2412 (2017).
162. Puebla C, Retamal MA, Acuña R, **Sáez JC**. Regulation of connexin-based channels by fatty acids. **Front Physiol**. 2017 Jan 24;8:11.
161. Gajardo-Gómez R, Labra VC, Maturana CJ, Shoji KF, Santibañez CA, Sáez JC, Giaume C, Orellana JA. Cannabinoids prevent the amyloid β -induced activation of astroglial hemichannels: A neuroprotective mechanism. **Glia**. 65(1):122-137 (2017).
160. Johnson RG, Le HC, Evenson K, Loberg SW, Myslajek TM, Prabhu A, Manley AM, O'Shea C, Grunenwald H, Haddican M, Fitzgerald PM, Robinson T, Cisterna BA, **Sáez JC**, Liu TF, Laird DW, Sheridan JD. Connexin Hemichannels: Methods for Dye Uptake and Leakage. **J Membr Biol**. 249(6):713-741 (2016).
159. Cisterna BA, Vargas AA, Puebla C, **Sáez JC**. Connexin hemichannels explain the ionic imbalance and lead to atrophy in denervated skeletal muscles. **Biochim Biophys Acta-Molecular Basis of Diseases**. 1862(11):2168-2176 (2016).
158. Cea LA, Balboa E, Puebla C, Vargas AA, Cisterna BA, Escamilla R, Riqueza T, **Sáez JC**. Dexamethasone-induced muscular atrophy is mediated by functional expression of connexin-based hemichannels. **Biochim Biophys Acta- Molecular Basis of Diseases**. 1862(10):1891-1899 (2016).
157. Maturana CJ, Aguirre A, **Sáez JC**. High glucocorticoid levels during gestation activate the inflammasome in hippocampal oligodendrocytes of the offspring. **Dev Neurobiol**. 77(5):625-642 (2017).
156. Cea LA, Bevilacqua JA, Arriagada C, Cárdenas AM, Bigot A, Mouly V, **Sáez JC**, Caviedes P. The absence of dysferlin induces the expression of functional connexin-based hemichannels in human myotubes. **BMC Cell Biol**. 2016 May 24;17 Suppl 1:15. doi: 10.1186/s12860-016-0096-6
155. Puebla C, Cisterna BA, Salas DP, Delgado-López F, Lampe PD, **Sáez JC**. Linoleic acid permeabilizes gastric epithelial cells by increasing connexin 43 levels in the cell membrane via a GPR40- and Akt-dependent mechanism. **Biochim Biophys Acta-Cell and Molecular Biology of Lipids**. 1861(5):439-448. (2016).
154. Cea LA, Puebla C, Cisterna BA, Escamilla R, Vargas AA, Frank M, Martínez-Montero P, Prior C, Molano J, Esteban-Rodríguez I, Pascual I, Gallano P, Lorenzo G, Pian H, Barrio LC, Willecke K, **Sáez JC**. Fast skeletal myofibers of mdx mouse, model of Duchenne muscular dystrophy, express connexin hemichannels that lead to apoptosis. **Cell Mol Life Sci**. 73(13): 2583-2599 (2016).
153. Graham ZA, Collier L, Peng Y, **Sáez JC**, Bauman WA, Qin W, Cardozo CP. A Soluble Activin Receptor IIB Fails to Prevent Muscle Atrophy in a Mouse Model of Spinal Cord Injury. **J Neurotrauma**. 33(12):1128-1135 (2016).
152. Talaverón R, Fernández P, Escamilla R, Pastor AM, Matarredona ER, **Sáez JC**. Neural progenitor cells isolated from the subventricular zone present hemichannel activity and form functional gap junctions with glial cells. **Front Cell Neurosci**. Oct 13;9:411. doi: 10.3389/fncel.2015.00411 (2015).
151. Harcha PA, Vargas A, Yi C, Koulakoff AA, Giaume C, **Sáez JC**. Hemichannels Are Required for Amyloid β -Peptide-Induced Degranulation and Are Activated in Brain Mast Cells of APP^{swe}/PS1^{dE9} Mice. **J Neurosci**. 35(25):9526-9538 (2015).
150. **Sáez JC**, Cisterna BA, Vargas A, Cardozo CP. Regulation of pannexin and connexin channels and their functional role in skeletal muscles. **Cellular and Molecular Life Sciences**. 72(15):2929-2935 (2015).

149. Orellana JA, Moraga-Amaro R, Díaz-Galarce R, Rojas S, Maturana CJ, Stehberg J, **Sáez JC**. Restraint stress increases hemichannel activity in hippocampal glial cells and neurons. **Front Cell Neurosci**. 2015 Apr 2;9:102. doi: 10.3389/fncel.2015.00102. eCollection 2015.
148. Riquelme MA, Cea LC, Vega JL, Puebla C, Vargas AA, Shoji KF, Subiabre M, **Sáez JC**. Pannexin channels mediate the acquisition of myogenic commitment in C₂C₁₂ reserve cells promoted by P2 receptor activation. **Frontiers in Cell Dev Biol** 06 May (2015).
147. Salas D, Puebla C, Lampe PD, Lavandero S, **Sáez JC**. Role of Akt and Ca²⁺ on cell permeabilization via connexin43 hemichannels induced by metabolic inhibition. **Biochim Biophys Acta- Molecular Basis of Diseases**. (2015) Mar 14. pii: S0925-4439(15)00068-X.
146. García I., Maripillán J, Jara O, Ceriani R, Palacios-Muñoz A, Ramachandran J, Olivero P, Pérez-Acle T, González C, **Sáez JC**, Contreras JE, Martínez AD. Keratitis-Ichthyosis-Deafness syndrome-associated Cx26 mutants produce non-functional gap junctions but hyperactive hemichannels when co-expressed with wild type Cx43. **J Invest Dermatol** (2015) 135(5):1338-1347. doi: 10.1038/jid.2015.20.
145. Rovegno M, Soto PA, Sáez PJ, Naus C, **Sáez JC**, von Bernhardt R. ATP released via Connexin 43 hemichannels and P2 receptors mediate secondary cellular damage spread from the trauma zone to distal zones in astrocyte monolayers. **Glia** 63(7):1185-1199 2015.
144. Cisterna BA, Cardozo C, Sáez JC. Neuronal involvement in muscular atrophy. **Frontiers in Cell. Neurosci**. 2014 Dec 10;8:405. doi: 10.3389/fncel.2014.00405. eCollection 2014..
143. Ardiles AO, Flores-Muñoz C, Toro-Ayala G, Cárdenas AM, Palacios AG, Muñoz P, **Sáez JC**, Fuenzalida M, Martínez AD. Pannexin 1 regulates the bidirectional hippocampal synaptic plasticity in the adult mice. **Frontiers in Cell. Neurosci**. 2014 Oct 15;8:326.
142. Figueroa V, Retamal MA, Cea LA, Salas JD, Vargas AA, Verdugo CA, Jara O, Martínez AD, **Sáez JC**. Gentamicin reversible blocks connexin hemichannels and does not affect gap junction channels. **Frontiers Cell. Neurosci**. 2014 Sep 4;8:265.
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1. **Sáez JC** and Jiang J. (Guest Eds) Special issue on Pannexin- and Connexin-Based Channels under Normal and Pathological Conditions **Int J Mol Sci.** 2021.
2. Langlet F, **Sáez JC**, García MA. (Guets Eds.) Special issue: Involvement of tanycytes in the neuroendocrine control of energy homeostasis. **Frontiers in Endocrinology** (2020).
3. Bai D and **Sáez JC (Eds)** Gap Junction channels and hemichannels. CRC Press | Taylor & Francis Group. (2017).
4. **Sáez JC** (Guest Ed.) Special issue II on connexin and pannexin channels **BMC Cell Biology** (2017).
5. **Sáez JC** and Martínez AD (Guest Eds) Special issue I on connexin and pannexin channels **BMC Cell Biology** (2016).
6. **Sáez JC** (Guest Ed.) Neuropharmacology. Connexin and pannexin channels. (2013).
7. **Sáez J.C.** (Guest Ed.) Antioxidant & Redox Signaling. Gap junctions and diseases. (2009).
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SCIENTIFIC LECTURES (INVITED)

49 lectures in different Chilean Universities and Research Institute, Institutions of USA (Yale University, UMDNJ, John Hopkins School of Medicine, NIH, Albert Einstein College of Medicine, University of Chicago and Mayo Clinic) in Mexico (UNAM), Spain (Instituto Ramón y Cajal and Hospital Ramón y Cajal), Brazil (Universidade de Sao Paulo and Instituto de Biofísica de Rio de Janeiro), France (Unité INSERM-Laboratoire de Neurobiologie Pharmacologique, Collège de France), Uruguay (Universidad de la República de Uruguay), Mexico (UNAM), Chile (Universidad de Chile, Universidad de Concepción, Universidad Austral de Chile, Universidad de Santiago de Chile). Univ. de Chile en Valparaíso, Univ. Católica de Valparaíso. Universidad de Chile. Jichi Medical School, Japan; Gunma University, Japan; University of San Antonio, Texas Tech in Lubbock. Down State University, Brooklyn, NY, USA. University of British Columbia, Canada. University of Leuven, Belgium. Fundación Ciencia & Vida-Santiago, Chile; Barcelona University. Universidad Javeriana, Bogotá, Colombia. Vatican-Rome; University of Hong

Kong.

Inaugural Conferences

- Milestones, science with history "-" A long trajectory to advance the understanding of the inflammatory response in chronic diseases "Masterclasses in Sciences. . Universidad de Valparaíso. **27 de Agosto 2019.**
- Opening lecture (Conference Dr. Luis Izquierdo) Plenary lecture at the joint meeting of the Chilean Physiology Soc. And the Chilean Pharmacology Soc. (**October 2015**).
- I National Contest of Science, Technology and Innovation Camps EXPLORA Scientific Camp Chile Va! "Conversations with the Master of Sciences" of the project entitled "A Scientific, Technological and Innovative Look at the Tarapacá Region", Iquique . (**Diciembre, 2014**)
- Brain Week, Montevideo, Uruguay, "A healthier life with the brain clock on time" (**March, 2014**).
- Opening lecture of the Academic year. Graduate program in Physiology and Neuroscience. University of Sevilla, Spain, Discovering the hemichannels and their functions in the nervous system and peripheral tissues (**September 2014**).
- Opening of the Academic Year. Graduate programs of the Faculty of Cell Biology, Universidad de Concepción. "A Personal Opinion on Postgraduate Studies from Vocation to Country Commitment " (**March 30, 2012**).
- Opening of the Academic Year. Graduate programs of the Faculty of Health Sciences at the Universidad de Antofagasta. " La vocacion: a personal experience in search of a contribution to the service of the country " (**May 9, 2013**).

MENTOR OF UNDERGRADUATE THESIS

- **2017-2019**. Catalina A. Ascencio Barria. "Análisis de la expresión y estado funcional de conexinas en cáncer de próstata". (Cotutoría con Dr. Alejandro Godoy).
- **2017-2019**. Camila Aravena. Biochemist, PUC Role of glial hemichannels in epilepsy.
- **2015-2016**. Fujiko Saveedra. "Participación de los hemicanales formados por conexinas en la atrofia de los músculos esqueléticos rápidos adultos producida por denervación". Bioquímico. Pontificia Universidad Católica de Valparaíso.
- **2014**. Angélica Benvenuto. Biochemist, PUC. Pathway of intercellular communication formed by connexins and pannexins in adipose tissue.
- **2011**. Mauricio A. Lillo (**Co-mentor with Dr. Xavier Figueroa**) Biochemist, PUC. Involvement hemichannels formed by connexins or pannexins in NO transport across the Plasma membrane in the vascular wall.
- **2009**. Anibal Vargas. Lic. Biología, PUC. Characterization of antimycin A as inhibitor of hemichannels formed by connexins.
- **2009**. Daniela P. Salas. (**Co-mentor with Dr. Sergio Lavandero**). Biochemist, Universidad de Chile. Hemichannels formed by connexins in volume regulation in myocardiocytes exposed to hyposmotic stress.
- **2009**. Paola Soto. Biologist, PUC. Study on channels formed by connexin32 in a cell line derived from oligodendrocytes.
- **2008**. Marlene Arismendi, Industrial Chemist, UTEM, Purification and biological activity of compounds derived from Boldo on channels formed by connexins.
- **2008**. Diego Hernández, Biologist, PUC. Regulation of astroglial and neuronal channels formed by connexins in neurodegenerative processes.
- **2009**. Natalia Vega, Biochemist, PUC. Regulation of cell membrane permeability by phosphorylation of hemichannels formed by connexin43 via protein kinase C (PKC).
- **2008**. Paloma Harcha, Biologist, PUC. D2SC1 cells express functional hemichannels formed by pannexin1.
- **2006**. Ariel Orellana. Biologist, PUC. Acquisition of myogenic commitment of reserve C₂C₁₂ cells requires activation of P2X receptors.
- **2006**. Pablo J. Sáez, Biologist, PUC. ATP and TNF- α induce formation gap junction channels in microglia.
- **2006**. Kenji Shoji, Biologist, PUC. The redox sensor of hemichannels formed by connexin43 is located in the carboxyl terminus of the protein subunit.



- **2005.** Juan Andrés Orellana, Biologist, PUC. Chlorpromazine inhibits the intercellular communication mediated by gap junctions in Gn-11 cells and astrocytes.
- **2005.** Constanza J. Cortés, Biologist, PUC. Opening of Cx43 hemichannels in mediated by oxidative mechanisms in astrocytes”.
- **2005.** Nicolás Palacios, Biologist, PUC. Modulation of the functional state of connexin-based channels by sexual hormones and tamoxifen in a cells line derived from human breast cancer.
- **2002-2003.** Manuel Riquelme-Biochemist, PUC. P2X receptors and connexin-based channels are needed for acquisition of myogenic commitment.
- **1998-1999.** Patricio Orió-Biochemist, Universidad de Chile. Molecular characterization and function gap junctions Express by Peripherals human lymphocytes.
- **1997.** Alejandro Sepúlveda-Biochemist, Univ. Austral de Chile. Gap junctions between antigen presenting cells and T cells: characterization and regulation of connexins.
- **1997.** Eliseo Eugénio-Biochemist, Univ. Austral de Chile. Regulation of glycogen stores by norepinephrine in rat pineal gland: role of gap junctions.
- **1994-1995.** Francisco Scheihing- Biochemist, Universidad Católica de Valparaíso. Effect of leptocarpin on gap junctions of epithelial cell lines.
- **1996.** Erwin Strahsburger-Biochemist, Univ. Austral de Chile. Regulation of gap junctional Communications in astroglial cells of the pineal gland.

MENTOR OF GRADUATE THESIS

2020-Presente. Claudia García. Doctorado en Neurociencias, Instituto de Neurociencias. Universidad de Valparaíso. Mejoramiento del tratamiento actual de la epilepsia considerando la neuroinflamación mediada por hemicanales

2012-2021. Elsa Fritz,(Co-tutor, Dr. Jorge Campusano) Doctor Ciencias Fisiológicas, PUC. "Rol de las inexas en el comportamiento coordinado por el ciclo circadiano de *Drosophila melanogaster*".

2012-2020. Ximena López. Doctor Ciencias Fisiológicas, PUC. Papel de hemicanales formados por Panexina 1 en la inhibición de la activación de linfocitos T CD4+ por adenosina

2013-2018. Dusan Recordón, Doctor Ciencias Fisiológicas, PUC. "Señalización purinérgica en el proceso de imitación vasculogénica".

2011-2018. Anibal Vargas, Doctor Ciencias Fisiológicas, PUC. "Participación de Hemicanales formados por Connexinas en atrofia muscular inducida por caquexia".

2013-2017. Gonzalo Gómez, Doctor Ciencias Fisiológicas, PUC. "La vía RhoA/ROCK regula la actividad de los hemicanales y canales de uniones en hendidura formados por Cx43 en el daño renal por Angiotensina II.

2009-2017. Paloma Hacha, Doctor ciencias Fisiológicas, PUC. "Participación de los hemicanales en la degranulación mediada por inmunoglobulina e en mastocitos murinos"

2011-2016. Bruno Cisterna. Doctor Ciencias Fisiológicas, PUC. "Role of connexin hemichannels in muscle atrophy induce by denervation".

2009-2016. Carola Marturana, Doctor Ciencias Fisiológicas, PUC. "Participación de los hemicanales formados por panexina 1 de oligodendrocitos, en la amielinización durante el estrés prenatal".

2009-2014. Daniela Salas. (Co-mentorship with Dr. Sergio Lavandero). "Regulación de la Cx43 cardiaca por insulina". Doctorado en Bioquímica, Universidad de Chile.

2012-2014. Carolina Urrutia- Activation of hemichannels formed by connexins promotes Ca^{2+} influx, oxidative stress and cell death, which is prevented by antioxidant agents that block hemichannels". Master in Science: Free Radicals and Biomedicine". University of Valparaíso.

2009-2013. Maximiliano Rovegno. (Co-mentorship with Dra. Rommy von Benhardi). "Activación inflamatoria en astrocitos inducida por el ATP liberado vía hemicanales formados por connexina, en un modelo de estudio *in vitro* del traumatismo encefalo - craneano (TEC). Doctorado en Ciencias Médicas, PUC.

2009-2013. Raúl Lagos Cabré. (Co-mentorship with Dr. Ricardo Moreno). "La modulación de proteínas de la familia ADAM por xenoestrógenos induce apoptosis en células germinales masculinas". Doctorado en Ciencias Fisiológicas, PUCC.

- 2008-2013.** Romina Hernández (Co-tutor con Dra. M.V. Velarde). Candidato a Doctor Ciencias Fisiológicas, PUC. Efecto de boldina en nefropatía diabética de ratas.
- 2008-2012.** Pablo J. Sáez. Candidato a Doctor Ciencias Fisiológicas, PUC. Regulación y función de los hemicanales y uniones en hendidura en la interacción de las células dendríticas y los linfocitos T.
- 2009-2012.** Vania Figueroa. (Co-mentorship with Dr. Agustín Martínez). Activación de hemicanales formados por hCx26 y hPx1, en condiciones fisiológicas y patológicas y su posible rol en la etiopatogénia de la sordera. Doctorado en Neurociencias, Universidad de Valparaíso.
- 2008-2012.** Luis A. Cea. Doctor Ciencias Fisiológicas, PUC. La actividad muscular controla los niveles de las conexinas 39, 43 y 45 en músculo esquelético de rata.
- 2008-2011.** Kenji Shoji. Doctor Ciencias Fisiológicas, PUC. Los linfocitos T presentan hemicanales formados por Px1 acoplados a los receptores P2X₇ y median la muerte linfocitaria iniciada por ATP extracelular.
- 2008-2010.** Juan A. Orellana. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. Papel y regulación de canales astrogliales formados por conexina43 en la muerte neuronal inducida por hipoxia en alta glucosa: potenciación por agentes neurodegenerativos,
- 2005-2010.** Manuel A. Riquelme. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. Papel de los hemicanales formados por la Panexina1 y del ATP extracelular durante la adquisición del compromiso miogénico y la potenciación de la contracción muscular esquelética adulta.
- 2003-2008.** Carolina Gatica de la Puente. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. Papel de los hemicanales y canales de uniones en hendidura, en la diferenciación neuronal y en la adquisición de compromiso miogénico en líneas celulares.
- 2005-2008.** Helmuth Sánchez. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. Participación de canales formados por conexina32 en respuestas celulares de dos modelos de isquemia-reperfusion *in-vitro*.
- 2007-2008.** Kurt A. Schalper. Doctor en Ciencias Médicas, PUC. Modulación funcional de hemicanales formados por conexinas por estímulos de distinta naturaleza.
- 2003-2005.** Mauricio A. Retamal. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas. PUC. Los Hemicanales formados por conexina43son sensibles a cambios en el potencial redox.
- 2003-2005.** (Co-mentorship with Dra. V. Abudara) Mauricio Garré. Efectos del factor fibroblástico FGF-1 sobre la comunicación intercelular a través de uniones en hendidura en el fenotipo reactivo neurotóxico de astrocitos espinales. Maestría en Biología, opción Neurociencias. PEDECIBA, Uruguay.
- 2001-2005.** Loreto P. Véliz. (Co-mentorship with Dr. M. Boric) Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. Expresión y función de las uniones en hendidura entre leucocitos y células endoteliales durante la inflamación.
- 1999-2004.** Roberto Araya. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. Papel de los receptores purinérgicos y de las uniones en hendidura en el proceso de diferenciación del músculo esquelético.
- 1999-2003.** Sra. Liliana Corvalán. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. “Uniones en hendidura en contactos entre células dendríticas y entre células dendríticas y linfocitos T”.
- 1999-2003.** Dr. Jorge Contreras. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. “Propiedades biofísicas y mecanismos de acción de los hemicanales formados por la conexina 43: posible participación en la muerte celular inducida por isquemia”.
- 1998-2001.** Dr. Eliseo A. Eugén. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas, PUC. “Uniones en hendidura (UH) entre macrófagos: identificación de conexinas, regulación de su expresión y su función en procesos metabólicos y celulares”.
- 1997-2000.** Dr. María C. Brañes. Doctor en Ciencias Biológicas, mención, Biología Celular y Molecular. PUC. “Los neutrófilos y las células endoteliales forman uniones en hendidura homo y heterocelulares reguladas por factores proinflamatorios”.
- 1996-1999.** Dr. Agustín Martínez. Doctor en Ciencias Biológicas, mención Ciencias Fisiológicas. PUC. “Regulación *in vitro* de las uniones en hendidura de células gliales en respuesta a condiciones que desencadenan un proceso inflamatorio y a mediadores de la respuesta inflamatoria”.
- 1996-1998.** Dr. Hernán González. Doctor en Ciencias Médicas. PUC. “Efecto de la endotoxemia sobre las uniones en hendidura del hígado de la rata”.



1989-1992. Dr. Viviana M. Berthoud, Ph.D. in Sciences. “Regulation of Gap Junctions”. Department of Neuroscience, Albert Einstein College of Medicine, Nueva York, E.E.U.U.

Mentor of Postdoctoral fellows:

Dr. Nicolás Palacios-Prado. Endogenous Pannexin1 forms functional gap Junction channels with unique biophysical properties (2018-2021).

Dr. Iván Bravo. Involvement of connexin hemichannels expressed by glial cells in depression. (2018-2020).

Dr. Iván Barría. Role of connexin-based channels expressed by glia in the cochlea under inflammatory conditions. (2018-2020)

Dr. Rosalba Escamilla. Role of hemichannels in oligodendrocytes of neuroinflammatory diseases.(2014-2020).

2014-2017. Dra. Elisa Balboa. Proyecto Fondecyt. Relevancia del estrés oxidativo, la disfunción mitocondrial y la expresión de conexas en la inducción de atrofia muscular por dexametasona.

Dr. Carlos Puebla. Role of hemichannels in membrane transport and regulation by PUFAs. (2011-2014).

Dr. Adam Aguirre. Regulation of hemichannels in brain cells by viral infections (2012-2016).

Dr. José L. Vega. Regulation of hemichannels by protein phosphorylation (2011-2013).

Dr. Luis A. Cea. Regulation and function of hemichannels in diseases of skeletal muscles (2012-2013).

Dr. Juan A. Orellana. Role of hemichannels in HIV infections (2010-2011).

Dr. Mauricio Retamal Regulation of connexin based channels by inflammatory conditions (2006-2007).

Dr. Claudia G. Sáez. Regulation of hepatic gap junction by chronic fibrosis (1993-1996).

PREVIOUS FUNDING:

Continuously funded by NIH (1988-1996).

Continuously funded by Fondecyt (1993-present).

INSERM-CONICYT (2007-2008).

ECOS-CONYCT, (2011-2013).

DAAD-CONICYT (2010-2011)

National Institute of Neurological Disorders and Stroke (2008-2012) (Co-investigator). Project Title: Cx43 Hemichannels: Gating Modification and Functions

Nucleo Milenio Inmunología e inmunoterapia. P04/030F (2006-2008) aprobada la renovación (2009-2011) (Co-investigador).

DAAD-CONICYT (2010-2011) Biological functions of connexin45 and pannexin1 hemichannels for contraction and inflammatory response of skeletal muscles in mice.

Proyecto Anillo ACT71 (2010-2013) (Director). Pro-inflammatory conditions increase the cell membrane permeability through pathways that offer new therapeutic target for human diseases.

FONDEF D07I1086 (2008-2013) (Investigador Principal). “
Improvement of molecular inhibitors for hemichannels for use as anti-inflammatory compounds in human diseases.

Current Funding

FONDECYT Regular 1210375 (Principal Investigator) (2021-2025) Distaling the role of hemichannels and pannexons on astroglial and neuronal dysfunction induced by heavy ethanol exposure

Millenium Institute, Centro Interdisciplinario de Neurociencias de Valparaíso. P09-022-F (2011-2020) Associate Investigator.

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PATENT APPLICATIONS

-Sáez JC, Maturana C y Lagos C.

“Inhibidores selectivos de hemicanales formados por conexinas para el tratamiento de la epilepsia.” en nombre de Pontificia Universidad Católica de Chile, de acuerdo a la siguiente información:

Número de Solicitud: **US 62/129432**

Fecha de presentación: **06-03-2015**

-Sáez JC, Lagos C.

Solicitud de patente “Nuevos moduladores de hemicanales de conexinas” en nombre de Pontificia Universidad Católica de Chile, de acuerdo a la siguiente información:

Número de Solicitud: **PCT/CL2015/050012**

Fecha de presentación: **14-04-2015**

-Sáez JC, Lagos C

“Moduladores específicos de hemicanales de conexinas”

INAPI Solicitud **2014:01556**.

-Christopher Cardozo, Carlos Toro-Chacon, Zachary Graham, Juan C. Sáez and Zhao Wei

Method for treating nervous system injuries using boldine and derivatives and thereof.

EFS ID: **39817302**

Application N°: **63043572**

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“CONNECTOMICA SPA”