Agustín D. Martínez – Professor
Director of Neuroscience Institute
Faculty of Science – Universidad de Valparaíso
Born August 14th, 1968 Santiago-CHILE

Education

1986-1991	Pontificia Univ. Católica de Chile	Bachelor of Biological Sciences
1994-1999	Pontificia Univ. Católica de Chile	Ph.D. in Physiology
1999-2004	The University of Chicago	Postdoctoral training

Academic positions

1991-1992	Pontificia Univ. Católica de Chile	Research Associate
1999-2004	The University of Chicago	Research Associate
2004-present	Univ. de Valparaíso	Associate Professor
2011-present	Univ. de Valparaíso	Director of the Master in Neuroscience program
2012-present	CINV	Research Associate

Honors, awards and competitive funding

1994-1997 Graduate (Ph.D) Fellowship award CONICYT

1996-1997 **FONDECYT** (*Fondo Nacional de Desarrollo Científico y Tecnológico,Chile*) 2960001 "*In vitro* studies of astrocytic gap junctional communication during hypoxia-reoxygenation". (**Principal Investigator**).

2001-2003 **American Heart Association (AHA)**, Research Award (ID 0120424Z) "Connexin oligomerization into gap junction channels". (**Principal Investigator**)

2004-2006 **Fundación Andes** (Programa de Inicio de Carrera para Jovenes Investigadores (C-13960). "Papel de los dominios de transmembrana de las conexinas en el proceso de oligomerización y en la formación de Uniones en Hendidura". (**Principal investigator**).

2004-2006 **Dirección de Investigación Universidad de Valparaíso (DIPUV-regular** . "Papel de la comunicación intercelular a través de las Uniones en Hendidura durante el proceso de neurogénesis in vitro". (**Principal Investigator**)

2005 **FONDECYT** 1050857 "Estudio del papel regulador de las conexinas sobre el proceso de neurogenesis y gliogenesis". (**Principal Investigator**).

2005-2009 **Proyecto Anillo de Investigación en Ciencia y Tecnología** ACT 46 "Superficies de interacción en el plegamiento y oligomerización de proteínas formadoras de canales iónicos". (**Principal Investigator**)

2007-2010 **FONDECYT 1085266 "**MECANISMOS MOLECULARES QUE GOBIERNAN EL "KISS-AND-RUN" DINAMINADEPENDIENTE:PARTICIPACIÓN DE SINAPTOFISINA Y PROTEÍNAS CON DOMINIO SH3". (**Co-PI**).

2009-2011 **FONDECYT** 1090573 "PATHOGENIC MECHANISM OF CONNEXIN26 MUTATIONS INVOLVED IN SYNDROMIC AND NON-SYNDROMIC DEAFNESS**" (Principal Investigator)**

2010-2012 **Proyecto Anillo de Investigación en Ciencia y Tecnología** ACT-71 "Condiciones proinflamatorias aumentan la permeabilidad de la membrana celular a través de vías que ofrecen nuevos blancos terapéuticos a enfermedades" (**Principal Investigator**).

2010-2014 **FONDECYT 1110552 "**CONTRIBUTION OF SRC KINASES, N-WASP AND CORTACTIN TO CORTICAL ACTIN REARRANGEMENT AND EXOCITOSIS DYNAMICS IN CHROMAFFIN CELLS" (**Co-PI**)

2012-2104 **FONDECYT-1120214.** Unsaturated fatty acids change Cx43, Cx46 and Cx50 hemichannels properties inducing lens cells damage. **(Co-PI)**

2012-2015 **ANILLO de Ciencia y Tecnología ACT-1104 "**Voltage Sensor of Ion Channels: From Structure to Function" (**Principal Investigator**)

2012-2015 **ANILLO de Ciencia y Tecnología ACT- ACT1121.** Mecanismos Moleculares y Celulares de Distrofia Muscular Relacionada con Mutaciones de Disferlina. (**Associate Research**)

2013-2016 **FONDECYT-1130855.** Mechanism of plasma membrane permeabilization induced by syndromic deafness mutations of Cx26. (**Principal Investigator**).

2013-2016 **FONDECYT-1130652.** Transdisciplinary studies based on computational biology, molecular biology, and electrophysiology, to get insights into the structure-function relationships coded into the molecular architecture of Cx26 hemichannels and Gap Junction channels. (**Co-PI**).

2016-2019 **FONDECYT-228539.** Is there a voltage-controlled hydraulic gating in the human Connexin 26 hemichannel?. **(Co-Investigador)**.

2017-2020 **FONDECYT-1171240.** MOLECULAR MECHANISMS OF CONNEXIN HEMICHANNEL HYPERACTIVITY IN KID (KERATITIS-ICHTHYOSIS-DEAFNESS) SYNDROME. **(Investigador Principal).**

2018-2021 **FONIS-SA18 | 0194.** Identificación de mutaciones causantes de sordera congénita en Chile. **Co-Investigador**.

2018-2021 **CORFO- Contratos Tecnológicos Para la Innovación.** Evaluación ADME/TOX de d4: un fármaco candidato para el tratamiento de la distrófia muscular. **Director Científico**.

Research: Molecular determinants of connexin oligomerization, gap junction formation and functionality in heath and disease. Biophysic and structure of Connexin and Pannexin channels. Role of Connexins and Pannexins in genetic deafness and skin disease, cell migration and tissue regeneration.

Publications

1.- M.P. Boric, **A.D. Martínez**, M.V. Donoso, and J.P. Huidobro-Toro. (1995) Neuropepetide Y is a vasoconstrictor and adrenergic modulator in the hamster microcirculation by acting on Y1 and Y2 receptors. Eur. J. Pharmacol. 294 : 391-401.

2.- J.C. Sáez, **A.D. Martínez**, M.C. Branes and H. González (1998) Regulation of gap junctions by protein phosphorylation. Brazilian J. Med. Biol. Res. 31 :593-600.
3.- A.D. Martínez, and J.C. Sáez. Arachidonic acid-induced cell uncoupling in rat astrocytes depends on cyclo- and lipo-oxygenase pathway and is blocked by melatonin. In : Gap Junctions. R. Werner (ed.) 1998, pp 224-248.
4.- A.D. Martínez, and J.C. Sáez (1999) Arachidonic acid-induced dye uncoupling in rat cortical astrocytes is mediated by arachidonic acid byproducts. Brain Res. 816: 411-423.
5.- A.D. Martínez, and J.C. Sáez (2000) Regulation of astrocyte gap junctions by hipoxia-reoxygenation. Brain Res. Rev. 32: 250-258.
6.- J.C. Sáez, M.C. Brañes, L.A. Corbalan, E.A. Eugenín., H.E. González, **A.D. Martínez**, F. Palisson. (2000) Gap junctions in cells of the immune system: structure, regulation and possible functional roles. Brazilian J. Med. Biol. Res. 33:447-445.
7.- J.C. Sáez, R. Araya, M.C. Branes, M. Concha, J.E. Contreras, E.A. Eugenin, **A.D. Martínez**, F. Palisson, M.A. Sepúlveda. (2000) Gap Junctions in Inflammatory Responses: Connexins, Regulation and Possible functional Roles. In: Perachia C. (ed.), Gap Junctions-Molecular Basis of Cell Communication in Health and Disease. Curr. Top. Membr. Biol., Acad. Press, San Diego, USA vol. 49, pp. 555-579.
8.- X.F. Figueroa, **A.D. Martínez**, D.R. González, P.I. Jara, S. Ayala, M.P. Boric (2001) In vivo assessment of microvascular nitric oxide production and its relation with blood flow. Am. J. Physiol. Heart Circ Physiol. 280: H1222-1231.
9.- S. Elenes, **A.D. Martínez**, M. Delmar, E.C. Beyer and A.P. Moreno (2001) Heterotypic docking of Cx43 and Cx45 connexons blocks fast voltage gating of Cx43. Biophysical Journal 81: 1406-1418.
10.- A.D. Martínez, V. Hayrapetyan, A.P. Moreno and E.C. Beyer (2002) Connexin43 and Connexin45 form heteromeric gap junctions channels in which individual components determine permeability and regulation. Circ. Res. 90:1100-7.
11.- A.D. Martínez, E.A. Eugenín, M.C. Brañes, M.V.L. Bennett, and J.C Sáez (2002) Identification of second messengers that induce expression of functional gap junctions in microglia cultured from newborn rats. Brain Res. 943: 191-201.
12.- X.F. Figueroa, D.R. González, **A.D. Martínez**, W.M. Duran and M.P. Boric (2002). Ach-induced endothelial NO synthase translocation, NO release and vasodilatation in the hamster microcirculation *in vivo*. J. Physiol. 544: 883-896.
13.- E.C. Beyer., J. Gemel, **A.D. Martínez**, V.M. Berthoud, V. Valiunas, A.P. Moreno, P. Brink (2002) Heteromeric Mixing of Connexins: Compatibility of partners and functional consequences. Cell Communication and Adhesion. 8: 199-204.
14.- J.C. Sáez., V.M. Berthoud, M.C. Brañes, **A.D. Martínez**, E.C. Beyer (2003) Plasma Membrane Channels Formed by Connexins: their Regulation and Functions. Physiol. Rev. 83: 1359-1400.
15.- A.D. Martínez, V. Hayrapetyan , A.P. Moreno, and E.C. Beyer (2003). A carboxyl terminal domain of Connexin43 is critical for gap junction plaque formation but not for homo- or hetero-oligomerization. Cell Communication and Adhesion 10: 323-328.
16.- X.F. Figueroa, K. Alviña, **A.D. Martínez**, G. Garcés, M. Rosemblatt, M.P. Boric, and J.C. Sáez (2004). Histamine reduces gap junctional communication of human tonsil high endothelial cells in culture. Microvascular Res. 68: 247-257
17.- G. Zhong, V. Hayrapetyan, **A.D. Martinez**, E.C. Beyer, A.P. Moreno (2004) The formation of multiheteromeric gap junction channels represent a novel regulatory

mechanism for intercellular communication. Cardiac Electrophysiology from Cell to Bedside. Eds. Zipes D.C. and Jalife J. Saunders NY.

18.- M. Wang, **A.D. Martinez**, V.M. Berthoud, K.H. Seul, J. Gemel, V. Valiunas, S. Kumari, P.R. Brink, E.C. Beyer (2005). Connexin43 with a cytoplasmic loop deletion inhibits the function of several connexins. Biochem. Biophys. Res. Commun. 333: 1185-1193.

19.- K.A. Schalper, N. Palacios-Prado, M.A. Retamal, K.F. Shoji, A.D. Martínez, and J.C. Sáez (2008). "Connexin hemichannel composition determines the FGF-1-induced membrane permeability and free [Ca2+]i responses". Mol. Biol. Cell 19: 3501-3513.

20.- A.D. Martinez, R. Acuña, V. Figueroa, J. Maripillan, B. Nicholson (2009) Gap Junction Channels dysfunction in deafness and hearing loss. Antioxidants and Redox Signaling. 11: 309-322.

21.- A.M. González-Jamett, M. Hevia, M.J. Guerra, **A.D. Martinez**, A. Neely, A.M. Cárdenas (2010). The association of dynamin with synaptophysin regulates catecholamine quantal size and duration of the exocytotic events in chromaffin cells. J. Neuroscience 30: 10683-10691.

22.- A.D. Martínez, R. Acuña, J.M., P.J. Minogue, V.M. Berthoud and E.C. Beyer (2011) Different domains are critical for oligomerization compatibility of different connexins. Biochem J. 436 (1): 35-43.

23.- K.A. Schalper, M.A. Riquelme, M.C. Brañez, **A.D. Martínez**, J.L. Vega, V.M. Berthoud, M.V. Bennett, J.C. Sáez (2012). Modulation of gap junction channels and hemichannels by growth factors. Mol Biosyst. 8(3):685-98.

24.- F.J. Morera, A. Alioua, P. Kundu, M. Salazar, C. Gonzalez, **A.D. Martinez**, E. Stefani, L. Toro, R. Latorre (2012). The first transmembrane domain (TM1) of β2-subunit binds to the transmembrane domain S1 of α-subunit in BK potassium channels. FEBS Lett. 586(16):2287-93.

25.- O. Jara, R. Acuña, I.E. García, J. Maripillán, V. Figueroa, J.C. Sáez, R. Araya-Secchi , C.F. Lagos, T. Pérez-Acle, V.M. Berthoud, E.C. Beyer, **A.D. Martínez** (2012). Critical role of the first transmembrane domain of Cx26 in regulating oligomerization and function. Mol Biol Cell. 23(17):3299-311.

26.- A.K. Schalper, M.A. Riquelme, M.C. Brañes, **A.D. Martínez**, J.L. Vega, V.M. Berthoud, M.V.L. Bennett, J.C. Sáez (2012) Modulation of gap junction channels and hemimchannels by growth factors. Molecular BioSystems. 8(3):685-98.

27.- J.A. Orellana, **A.D. Martinez**, M.A. Retamal (2013). Gap junction channels and hemichannels in the CNS: Regulation by signaling molecules. Neuropharmacology 74:567-582.

28.- V. Figueroa, P.J. Sáez, J.D. Salas, O. Jara, **A.D. Martínez**, J.C. Sáez, M.A. Retamal. (2013) Linoleic acid induces opening of connexin26 hemichannels through a PI3K/Akt/Ca(2+)-dependent pathway. Biochim Biophys Acta. 1828(3):1169-7.

29.- A.M. González-Jamett, F. Momboisse, M.J. Guerra, S. Ory, X Báez-Matus, N. Barraza, V. Calco, S. Houy, E. Couve, A. Neely, **A.D. Martínez**, S. Gasman, A.M. Cárdenas AM (2013) Dynamin-2 regulates fusion pore expansion and quantal release through a mechanism that involves actin dynamics in neuroendocrine chromaffin cells. PLoS One. 8(8):e70638.

30.- P. Pastor, P. Cisternas, K. Salazar, C. Silva-Alvarez, K. Oyarce, N. Jara, F. Espinoza, **A.D. Martínez**, F. Nualart (2013) SVCT2 vitamin C transporter expression in progenitor cells of the postnatal neurogenic niche. Front Cell Neurosci. 7:119.
31.- A.O. Ardiles, J. Ewer, M.L. Acosta, A. Kirkwood, **A.D. Martinez**, L. Ebensperger, F. Bozinovic, T.M. Lee, A.G. Palacios (2013). Octodon degus (Molina 1782): a model in comparative biology and biomedicine. Cold Spring Harb Protoc. 2013 Apr 1;2013(4):312-8.
32.- A. Pupo, D. Baez-Nieto, **A.D. Martínez**, R. Latorre, C. González (2014) Proton channel models: Filling the gap between experimental data and the structural rationale. *Channels* (Austin). 8, 1–13.
33.- R. Araya-Secchi, T. Perez-Acle, S. Kang, T. Huynh, A. Bernardin, Y. Escalona, J-A Garate, **A. D. Martínez**, I. Garcia, J.C. Sáez, R. Zhou (2014) Characterization of a novel water pocket inside the human Cx26 hemichannel structure. *Biophys J*. 107(3):599-612.
34.- A.O. Ardiles, C. Flores-Muñoz, G. Toro-Ayala, A.M. Cárdenas, A.G. Palacios, P. Muñoz, M. Fuenzalida, J.C. Saez, **A.D. Martinez** (2014) Pannexin 1 Regulates Bidirectional Hippocampal Synaptic Plasticity in Adult Mice. *Front. Cell. Neurosci*. 8:326.
35.- V.A. Figueroa, M.A. Retamal, L.A. Cea, J.D. Salas, A.A. Vargas, C.A. Verdugo, O. Jara, **A.D. Martínez,** J.C. Sáez (2014) Extracellular gentamicin reduces the activity of connexin hemichannels and interferes with purinergic Ca2+ signaling in HeLa cells. *Front. Cell. Neurosci*. 8:265. doi: 10.3389/fncel.2014.00265

36.- F. Momboisse, M.J. Olivares, X. Báez-Matus, M.J. Guerra, C. Flores-Muñoz, J.C. Sáez, **A.D. Martínez**, A.M. Cárdenas (2014). Pannexin 1 channels: new actors in the regulation of catecholamine release from adrenal chromaffin cells. Front Cell Neurosci. 8:270. doi: 10.3389/fncel.2014.00270. eCollection.

37.- A. Palacios-Muñoz, M.J. Escobar, A. Vielma, J. Araya, A. Astudillo, G. Valdivia, I.E. García, J. Hurtado, O. Schmachtenberg, **A.D. Martínez**, A.G. Palacios (2014). Role of connexin channels in the retinal light response of a diurnal rodent. Front Cell Neurosci. 8:249. doi: 10.3389/fncel.2014.00249.
38.- P. Prado-Gutierrez, A. Castro-Fariñas, L. Morgado-Rodriguez, E. Velarde-Reyes, **A.D.** Martínez, E. Martínez-Montes (2015). Habituation of auditory steady state responses evoked by amplitude-modulated acoustic signals in rats. Audiology Research 5(1): 113. doi: 10.4081/audiores.2015.113

39.- I.E. García, J. Maripillán, O. Jara, R. Ceriani, A. Palacios-Muñoz, J. Ramachandran, P. Olivero, T. Pérez-Acle, C. González, J. C. Saéz, J.E. Contreras**, A.D. Martínez** (2015). Keratitis-Ichthyosis-Deafness Syndrome-Associated Cx26 Mutants Produce Nonfunctional Gap Junctions but Hyperactive Hemichannels When Co-Expressed With Wild Type Cx43. J. of Investigative Dermatology. 135(5): 1338-1347 doi: 10.1038/jid.2015.20.
40.- M.A. Retamal, E.P. Reyes, I.E. García, B.Pinto, **A.D. Martínez,** C. González (2015). Diseases associated with leaky hemichannels. Frontiers in Cellular Neuroscience. 9:267. doi: 10.3389/fncel.2015.00267.
41.- M.A. Retamal, C.G. León, M. Ezquer, F. Ezquer, R. Del Rio, A. Pupo, **A.D. Martínez**, C. González. *Carbon Monoxide: A New Player in the Redox Regulation of Cx-Hemichannels*. IUBMB life, 67(6):428-37. doi: 10.1002/iub.1388

42.- I.E. Garcia, F. Bosen, P. Mujica, A. Pupo, C. Flores-Muñoz, O. Jara, C. Gonzalez, K. Willecke, **A.D. Martínez** (2016). From Hyeperactive Connexin26 Hemichannels to Impairements in Epidermal Calcium Gradient and Permeability Barrier in Keratitis-Ichthyosis-Deafness Syndrome. Journal of Investigative Dermatology, 136:574-583. doi:10.1016/j.jid.2015.11.017.

43.- I.E. García, P. Prado, A. Pupo, O. Jara, D. Rojas-Gómez, P. Mujica, C. Flores-Muñoz, J. González-Casanova, C. Soto-Riveros, M. Retamal, C. González, **A.D. Martínez** (2016) Connexinopathies: a structural and functional glimpse. BMC-Cell Biology, 17(Suppl 1):71-87.

44.- A.D. Martínez, O. Jara, R. Ceriani, J. Maripillán, P. Mujica, I.E. García (2016) Methods to determinate formation of heteromeric hemichannels. In press, Book title: Gap Junction Channels and Hemichannels. A Volume in the Methods in Signal Transduction Series". Chapter 11.

45.- B.I. Pinto, I.E. García, A. Pupo, M.A. Retamal, **A.D. Martínez**, R. Latorre, C. González (2016). Charged residues at the first transmembrane region mediate the voltage dependence of connexins slow gate. J. Biol. Chem. 291(30):15740-52.

46.- Guoqiang Zhong, Nazem Akoum, Daniel A. Appadurai, Volodya Hayrapetyan, Osman Ahmed, **Agustin D. Martinez** , Eric C. Beyer and Alonso P. Moreno (2017). Mono-Heteromeric Configurations of Gap Junction Channels Formed by Connexin43 and Connexin45 Reduce Unitary Conductance and Determine both Voltage Gating and Metabolic Flux Asymmetry. Frontiers in Physiology, 29;8:346.

47.- Isaac E. García, Helmuth A. Sanchez, and **Agustín D. Martinez** and Mauricio A. Retamal (2018). Nitric oxide-mediated regulation of connexin proteins. BBA-Biomembranes. 1860(1):91-95.

48.- Bernardo I. Pinto, Amaury Pupo, Isaac García, **Agustín D. Martínez**, Ramón Latorre and Carlos González (2017). Cooperativity between Calcium binding and voltage gating in Cx46 hemichannels. Sci Rep.7(1):15851

49.- García IE, Villanelo F, Contreras GF, Pupo A, Pinto BI, Contreras JE, Pérez-Acle T, Alvarez O, Latorre R, **Martínez AD**, González C (2018). The syndromic deafness mutation G12R impairs fast and slow gating in Cx26 hemichannels. J Gen Physiol. 150(5):697-711. doi: 10.1085/jgp.201711782.

50.- Gajardo I, Salazar CS, Lopez-Espíndola D, Estay C, Flores-Muñoz C, Elgueta C, Gonzalez-Jamett AM, **Martínez AD**, Muñoz P, Ardiles ÁO (2018). Lack of Pannexin 1 Alters Synaptic GluN2 Subunit Composition and Spatial Reversal Learning in Mice. Front Mol Neurosci. 11:114. doi: 10.3389/fnmol.2018.00114.

51.- Vásquez-Navarrete J, **Martínez AD**, Ory S, Baéz-Matus X, González-Jamett AM, Brauchi S, Caviedes P, Cárdenas AM (2018). RCAN1 Knockdown Reverts Defects in the Number of Calcium-Induced Exocytotic Events in a Cellular Model of Down Syndrome. Front Cell Neurosci. 2018 Jul 6;12:189. doi: 10.3389/fncel.2018.00189.

52.- Pinto C, Medinas DB, Fuentes-Villalobos F, Maripillán J, Castro AF, **Martínez AD**, Osses N, Hetz C, Henríquez JP (2019). β-catenin aggregation in models of ALS motor neurons: GSK3β inhibition effect and neuronal differentiation. Neurobiol Dis. 2019 Oct;130:104497. doi: 10.1016/j.nbd.2019.104497.

53.- Eugenin 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. 2019 Aug 5. doi: 10.1111/jnc.14846.

54.- Guerra MJ, González-Jamett AM, Báez-Matus X, Navarro-Quezada N, **Martínez AD**, Neely A, Cárdenas AM (2019) The Ca2+ channel subunit CaV β2a-subunit down-regulates voltage-activated ion current densities by disrupting actin-dependent traffic in chromaffin cells. J Neurochem. 2019 Aug 16. doi: 10.1111/jnc.1485.
55.- Paloma A. Harcha, Ximena López, Pablo J. Sáez, Paola Fernández, Iván Barría, **Agustín D. Martínez** and Juan C. Sáez (2019) Pannexin-1 channels are essential for mast cell degranulation triggered during Type I hypersensitivity reactions. Front Immunol. 2019 Nov 29;10:2703. doi: 10.3389/fimmu.2019.02703. eCollection 2019.
56.- Maldifassi MC, Momboisse F, Guerra MJ, Vielma AH, Maripillán J, Báez-Matus X, Flores-Muñoz C, Cádiz B, Schmachtenberg O, **Martínez AD**, Cárdenas AM (2020) The interplay between α7 nACh receptors, pannexin-1 channels and P2X7 receptors elicit exocytosis in chromaffin cells. J Neurochem. 2020 Sep 15. doi: 10.1111/jnc.15186. Online ahead of print.
57.- Figueroa VA, Jara O, Oliva CA, Ezquer M, Ezquer F, Retamal MA, **Martínez AD**, Altenberg GA, Vargas AA (2020) Contribution of Connexin Hemichannels to the Decreases in Cell Viability Induced by Linoleic Acid in the Human Lens Epithelial Cells (HLE-B3). Front Physiol. 2020 Jan 20;10:1574. doi: 10.3389/fphys.2019.01574. eCollection 2019.
58.- Flores-Muñoz C, Maripillán J, Vásquez-Navarrete J, Novoa-Molina J, Ceriani R, Sánchez HA, Abbott AC, Weinstein-Oppenheimer C, Brown D, Cárdenas AM, García IE, and **Martínez AD**. Restraint of skin fibroblast motility, migration and cell surface actin dynamics by pannexin 1 and P2X7 receptor signaling. **Accepted in** *International Journal of Molecular Sciences.*
59.- López X, Escamilla R, Fernández P, Duarte Y, González-Nilo F, Palacios-Prado N, **Martínez AD**, Sáez JC. Stretch-Induced Activation of Pannexin 1 Channels Can Be Prevented by PKA-Dependent Phosphorylation. Int J Mol Sci. 2020 Dec 2;21(23): 9180. doi: 10.3390/ijms21239180

60.- O. Jara, J. Maripillán, I.E. Garcia, F. Momboisse, A. Neely, A.M. Cardenas, **A.D. Martínez.** Disruption of cortical actin cytoskeleton removes RhoA control of connexin hemichannels. Under preparation.
61.- C. Flores-Muñoz, J. Maripillán, A. Ardiles, **A.D. Martínez**. Regulation of Dendritic Growth and Plasticity by Pannexin-1. Under preparation.
62.- I.E. Garcia, J. Maripillán, J.E. Contreras, C. Gonzalez, **A.D. Martínez**. Molecular Mechanism of Heteromeric Hemichannel Hyperactivity in Syndromic Deafness. Under preparation.

Scientific Meeting and Symposium presentations (2010-2015).

International Scientific Meetings

1.- I.E Garcia, R. Ceriani, O. Jara, J. Maripillán, **A.D. Martínez**. Syndromic and non-syndromic deafness mutations in the Cx26 aminoterminus differentially alter the function of hemichannels and gap junctions. *ASCB meeting. Philadelphia, USA, 2010.*
2.- Paola. Soto, Paola Fernández, Maximiliano Rovegno, **Agustín D. Martínez**, Bruno

Cisternas, Felipe Court, Alexis Vielma, Oliver Schmachtenberg and Juan C. Sáez. Novel inter-oligodendrocyte communication pathway. *International Gap Junction Conference, Ghent, Belgica, 2011.*

3.- Andrés Canales, Jaime Maripillán, Oscar Jara, David Gómez, Patricio Orio, **Agustín D. Martínez**. MODELING THE DYNAMICS OF GAP-JUNCTION PLAQUE ASSEMBLY THROUGH A SELF-ORGANIZING MECHANISM. *International Gap Junction Conference, Ghent, Belgica, 2011.*

4.- Oscar Jara, Isaac García, Jaime Maripillán, Juan Carlos Sáez, Vania Figueroa, Viviana M. Berthoud, Eric C. Beyer and **Agustín D. Martínez**. DEAFNESS-ASSOCIATED CX26 MUTANTS DEMONSTRATE THE IMPORTANCE OF THE FIRST TRANSMEMBRANE DOMAIN IN CONNEXIN OLIGOMERIZATION AND CHANNEL FUNCTION. *International Gap Junction Conference, Ghent, Belgica, 2011.*

5.- V. Figueroa, O. Jara, **A.D. Martínez**, M. Fiori, G. Altenberg, and J.C. Sáez. Connexin Hemichannels in the purinergic signaling and their regulation in ototoxicity. *International Gap Junction Conference, Ghent, Belgica, 2011.*

6.- A.D. Martínez. Mutations in Cx26 and its role in genetic hearing loss. Summer course for postgraduate students: *PROGRESS IN NEUROLOGICAL DISORDERS: BASIC AND TRANSLATIONAL RESEARCH. U de Concepción. Concepción, 2011.*

7.- A.D. Martínez. How to learn to play the Tsuzumi without becoming deaf in the try ? *NZ National eye centre, Seminar Series, The University of Auckland, NZ, 2012.*

8.- I.E. García, R. Ceriani, J. Maripillán, O. Jara, **A.D. Martínez**. Gain of function of hemichannels produced by aberrant interactions between Cx43 and deafness-associated Cx26. *International Gap Junction Conference 2013, USA, Charleston, 2013.*

9.- Isaac E. García , Mauricio Retamal , Oscar Jara , Carlos Gonzalez and **Agustín D. Martínez**. ¿IS THE GAIN OF HEMICHANNEL ACTIVITY A COMMON FEATURE SHARED BY Cx26 SYNDROMIC DEAFNESS MUTANTS?. *Biophysical Society, USA, 2014.*

10.- Bernardo Pinto, Amaury Pupo, Isaac García, **Agustín D Martínez**, Ramón Latorre, Carlos González. The first transmembrane segment of connexins and voltage-dependent gating regulation of hemichannels. *International Gap Junction Conference, Valparaíso, 2015.*

11.- Pavel Prado, Oscar Jara, Cristián Aedo, Donald Brown, Álvaro Ardiles, Daphne Marfull, Virginia Olivares, Juan C Saéz, Paul Delano, **Agustín D. Martínez**. Lack of Pannexin 1 alters permeability of cochlear supporting cells and induces sensorineural hearing loss. *International Gap Junction Conference, Valparaíso, 2015.*

12.- Oscar Jara, Jaime Maripillán, Fanny Momboisse, Isaac Garcia, Bernardo Pinto, Carlos González, Ana María Cárdenas, **Agustín D Martínez**. Regulation of gap junction channels and hemichannels by actin cytoskeleton and RhoA. *International Gap Junction Conference, Valparaíso, 2015.*

13.- Isaac Garcia, Carlos González, Jorge Contreras, **Agustín D Martínez**. Slow deactivation kinetics of hyperactive heteromeric hemichannels formed by Cx26 N-terminus KID-associated mutants and Cx43. *International Gap Junction Conference, Valparaíso, 2015.*

14.- Carolina Flores, Jacqueline Vasquéz, Jaime Maripillán, Tomás Egaña, Donald Brown, Agustín D Martínez. Pannexin and purinergic signaling in fibroblast migration and dermal regeneration. *International Gap Junction Conference, Valparaíso, 2015.*

15.- J. Gonzalez-Casanova, D. Rojas-Gomez, **A.D. Martinez**, S. Dhein. Angiotensin (1-7) induces adipogenesis and down regulation of Cx43 in 3T3-L1 cell line; possible role of p38 and focal adhesion kinase. *International Gap Junction Conference, Valparaíso, 2015.*
16.- Fanny Momboisse, María J Olivares, Ximena Baéz, María J Guerra, Carolina Flores-Muñoz, Juan C Saez, **Agustín D Martínez**, Ana M Cárdenas. Pannexin 1 channels: a new actor in the regulation of catecholamine release from adrenal chromaffin cells. *International Gap Junction Conference, Valparaíso, 2015.*
17.- Paula Mujica, Oscar Jara, Jaime Maripillan, **Agustín D. Martínez**. Mechanism of deafness mutations associated to the first extracellular loop of Cx26 unveils a new cis interaction properties between connexins. *International Gap Junction Conference, Valparaíso, 2015.*
18.- Claudia Pareja, Tomas Perez-Acle, Yerko Escalona, Jose Antonio Garate, Alejandro Bernardin, **Agustín D. Martínez**, Isaac Garcia, Juan C Saez, Raul Araya, Tien Huynh, Seung-gu Khan, Ruhong Zhou. Is there a voltage-controlled hydraulic gating mechanism in human connexin hemichannels?. *International Gap Junction Conference, Valparaíso, 2015.*
19.- D. Rojas-Gomez, J. Gonzalez-Casanova, S. Dhein, **A.D. Martínez**. Inhibition of 3T3-L1 adipogenesis by Angiotensin II: differential regulation of the gap junction protein Connexin 43 and β-catenin signaling. *International Gap Junction Conference, Valparaíso, 2015.*

National Scientific Meetings

1.- I.E. Garcia, R. Ceriani, O. Jara, J. Maripillan, A. Canales, J.C. Saez, **A.D. Martinez**. Mutations in the N terminus of the Connexin26 and its role in genetic hearing loss. *Reunion Anual Sociedad de Bilogia Celular de Chile / Pucon, 2010.*
2.- O. Jara, I. García, J. Maripillan, A. Canales, J.C. Sáez, **A.D. Martínez.** ALTERED PERMEABILITY OF GAP JUNCTION CHANNELS AND HEMICHANNELS FORMED BY MUTANTS OF Cx26 RELATED TO NON-SYNDROMIC DEAFNESS. *Reunion Anual Sociedad de Bilogia Celular de Chile / Pucon, 2010.*
3.- J. Castex, O. Jara, J. Maripillán, C. Estay, **A.D. Martínez**. Regulation of hemichannel permeability by the Carboxyl Terminal domain of Cx43. *Reunion Anual Sociedad de Bilogia Celular de Chile / Pucon, 2010.*
4.- A. Canales, D. Gomez, J. Maripillan, O. Jara, I. García, P. Orio, **A.D. Martinez**. Modeling the dynamic of Gap-junction plaque assembling through a self-organizing mechanism. *Sociedad de Bilogia Celular de Chile / Pucon, 2010.*
5.- Agustín D. Martínez. Deafness-associated Cx26 mutants demonstrate the importance of the first transmembrane domain in connexin oligomerization and channel function. *40 years of ion channels. A marriage of convenience. Valparaíso, 2011.*
6.- Agustín D. Martínez. Connexin oligomerization and trafficking. *International Workshop Structure and function of connexin and pannexin channels. Valparaíso, 2012.*
7.- Agustín D. Martínez. Is syndromic deafness a hemichannel disease?. International Workshop Structure and function of connexin and pannexin channels. Valparaíso, 2012.

8.- Agustín D. Martínez. ¿ Como conversan las células? *Charla Explora, Villa Alemana, 2012.*
9.- O. Jara, J. Maripillán, I.E. Garcia, J. Ewer, **A.D. Martinez**. ACTIN CYTOSKELETON REGULATION OF Cx26 AND Cx43 HEMICHANNELS. *Reunión anual de la Sociedad de Biología Celular de Chile 2013. Puerto Varas, 2013*
10.- C. Flores, C. Estay, T. Egaña, D. Brown, **A.D. Martínez**. ROLE OF HEMICHANNELS IN FIBROBLAST MIGRATION. *Reunión Anual de la Sociedad Chilena de Biología Celular, Puerto Varas, 2013.*
11.- A.O. Ardiles, C. Flores, J. Ahumada, J.C. Sáez, M. Fuenzalida, **A.D. Martínez**. Loss of pannexin 1 modifies the threshold for synaptic plasticity induction in hippocampus. *Reunión anual de la Sociedad de Biología Celular de Chile. Puerto Varas, 2013.*
12.- Agustín D. Martínez. How to learn to play the Tsuzumi without becoming deaf in the try. *VIII Congreso Iberoamericano de Biofísica - IX Reunión Anual Sociedad Chilena de Neurociencia. Valparaíso, 2013.*
13.- Agustín D. Martínez. Aberrant connexin oligomerization in genetic deafness. *CHILEAN SOCIETY FOR CELL BIOLOGY XXVII ANNUAL MEETING. Puerto Varas, 2013.*
14.- A. Ardiles, C. Flores-Muñoz, **A.D. Martínez**. Pannexin 1 regulates the NMDA receptors trafficking through the modification of actin. *Workshop "Current advances in membrane trafficking: Implications for polarity and diseases" organizado por EMBO, Puerto Natales, 2014.*
15.- Bernardo Pinto, David Baez-Nieto, **Agustín D. Martínez**, Ramón Latorre, Carlos González. Dentification of Residues Involved in Cx26 Hemichannel Slow Gating. *X Annual Meeting. Sociedad Chilena de Neurociencia. Valdivia, 2014.*
16.- A. Ardiles, C. Flores-Muñoz, P. Muñoz, **A.D. Martínez**. PANNEXIN 1 REGULATES BIDIRECTIONAL HIPPOCAMPAL SYNAPTIC PLASTICITY IN ADULT MICE. *X Reunión Anual de la Sociedad Chilena de Neurociencia. Valdivia, 2014.*
17.- P. Mujica, O. Jara, J. Maripillán, **A.D. Martínez**. Mechanism of deafness mutations associated to the first extracellular loop of Cx26 unveils a new interaction property between connexins. Reunión Anual de la Sociedad Chilena de Neurociencia. Valdivia, 2014.
18.- P. Prado-Gutierrez, D. Marfull, D. Brown, A. Ardiles, C. Flores, V. Olivares, **A.D. Martínez**. Lack of pannexin 1 in the murine cochlea results in sensorineural hearing loss. *Reunión Anual de la Sociedad Chilena de Neurociencia, Valdivia, 2014.*

Organization of International and National Workshops, Symposium and Congress

1.- International Workshop. Structure and function of connexin and pannexin channels. *Valparaíso, 2012.*
2.- International Symposium. 40 years of ion channels. A marriage of convenience. *Valparaíso, 2011.*
3.- Serie de seminarios y cursos Proyecto Mecesup 0804. *Facultad de Ciencias / Auditorio de Farmacia, Valparaíso, 2010.*
4.- Symposium: Role and regulation of channels and hemichannels formed by connexins

or pannexins in the nervous system. *IX Annual meeting of the Chilean Society of Neuroscience & VIII Ibero American Congress of Biophysics. Valparaíso, 2013.*
5.- Symposium: "Cell Membrane Channels Made by Connexins or Pannexins are Key Players in Genetic and Acquired Diseases". *CHILEAN SOCIETY FOR CELL BIOLOGY XXVII ANNUAL MEETING. Puerto Varas, 2013.*
6.- International workshop. Biophysic of Hemichannel and Gap Junction Channels: A Theoretical and Practical Training. *PUC-Santiago/UV-Valparaíso 2015 (24 a 27 de Marzo).*
7.- International Gap Junction Conference 2015. *Valparaíso, 2015 (http://cinv.uv.cl/igjc2015/).* Este es un evento de envergadura mayor, la principal reunión Internacional sobre las "Gap Junctions" que se hace cada dos años alternado entre USA y Europa, por lo que es la primera vez que se hace en el hemisferio sur. Al evento asistieron cerca de 200 investigadores mayormente extranjeros. La postulación para la realización de este congreso en Chile se presentó en la conferencia del 2012 en la ciudad de Charleston donde la mayoría de los asistentes eligió la opción de Valparaíso por sobre las opciones de Europa y Asia, constituyéndose ello en un gran logro y reconocimiento para nuestro grupo.

Advising of pre-graduate theses

1.- Rodrigo Acuña. Determinación del dominio de transmembrana implicado en la homo-oligomerización de conexinas 43 y 26 mediante la técnica de TOXCAT. Bioquímico, PUCV. 2007
2.- Vania Figueroa. Efectos del ácido retinoico y el factor neurotrófico ciliar sobre el patrón de expresión de connexina43 y sus consecuencias en la diferenciación neuronal de células P19. Bioquímico, PUCV. 2007
3.- Carla Pacheco. Regulación de la neurogénesis en células del epitelio olfatorio dependiente de la vía de comunicación intercelular mediada por Uniones en Hendidura. Bioquímico, PUCV. 2007
4.- Daniela Correa. Papel del C terminal en la formación y permeabilidad/selectividad de Uniones en Hendidura de Cx43 y Cx45. Bioquímico, PUCV. 2007
5.- Oscar Jara. Efectos de mutaciones de la Conexina 26, causantes de sordera genética, sobre el tráfico y formación de Uniones de Hendidura. Bioquímico, PUCV. 2010
7.- Catherine Estay. Papel de Cx43 en el desplazamiento de Fibroblastos embrionarios. Licenciatura en Biología/Química-UV. 2011.
8.- Carolina Flores. Rol de hemicanales de Panexina 1 en la migración cellular de fibroblastos dérmicos. Licenciatura en Biología/Química-UV. 2013
9.- Paula Mujica. Mechanism of syndromic mutations located in the extracellular loop of Cx26. Undergraduate Biochemistry degree PUCV. 2015

Advising of post-graduate theses

1.- Jorge Castex. Papel del carboxilo terminal en la funcionalidad y permeabilidad de hemicanales de Cx43. (Master degree in Neuroscience, UV)

2.- Miguel Fuentes. Papel de la comunicación intercelular mediada por uniones en hendidura y hemicanales durante el proceso de diferenciación de células madres de piel aulta. (Master degree in Neuroscience, UV)
3.- Ricardo Ceriani. Caracterización de la mutante Cx26N14Y y su efecto en la formación y funcionalidad de Uniones en Hendidura y Hemicanales formados por las connexinas 26 y 43 (Master degree in Neuroscience, UV)
4.- Jaime Maripillán. Papel del citosqueleto en el ensamblaje y tráfico de Hemicanales y Uniones en Hendidura. (Master degree in Neuroscience, UV)
5.- Carolina Flores. Regulación de la plasticidad neuronal estructural por Panx1. (Master degree in Neuroscience, UV).
6.- Vania Figueroa. Role of connexin 26 hemichannels in the regulation of intracellular calcium signal induced by activation of purinergic receptors, under physiological and pathological conditions. (PhD. In Neuroscience; Co-Advisor). 2013
7.- Arlek Gonzalez. Dynamin-2 regulates exocytosis in adrenal chromaffin cells through a mechanism that involves actin polymerization (PhD. In Neuroscience. Co-Advisor). 2013.
8.- Isaac Garcia. Role of the Amino Terminus of Cx26 in the regulation of channel oligomerization and function. (PhD. In Neuroscience). 2014
9.- Oscar Jara. Regulation of gap junction channels and hemichannels by actin cytoskeleton and RhoA. (PhD. In Neuroscience)
10.- Ana Abbott. FORMATION OF HETEROMERIC CHANNELS BY Cx26S17F SYNDROMIC DEAFNESS MUTANT AND Cx30 AND ITS CONSEQUENCES ON COCHLEAR PATHOLOGY. 2020 (PhD. In Neuroscience)

Invited Member of PhD and MSc Committees and Examinations

1.- I was member in about 23 committees.

Current External Collaborators

1.- Viviana Berthoud (The University of Chicago)
2.- Eric Beyer (The University of Chicago)
3.- Jorge Contreras (Rutgers University)
4.- Juan Carlos Sáez (Pontificia Universidad Católica de Chile)
5.- Mauricio Retamal (Universidad del Desarrollo)

Member of Scientific Evaluation Panels

1.- Member of the study section “Biología 2” of FONDECYT (2015-2018) for regular, postdoc and initiation grant evaluation. Director by period 2017-2018.
2.- Member of the evaluation panel for Tandem-Max Planck-CINV-UV group leader (2015).

Undergraduate teaching

1.- Cell Biology, Degree in Biology and Chemistry, Universidad de Valparaíso, 2006-present.
2.- Scientific Methods, Degree in Biology and Chemistry, Universidad de Valparaíso, 2008-present.
3.- Experimental Cell Biology, Degree in Biology and Chemistry, Universidad de Valparaíso. This is an optative course for students that take the Biology specialization. 2009-present.

Postgraduate teaching

1.- Ph.D in Neuroscience. Backbone course. Topics: Synthesis of protein (translation). Electrical synapses. Neurogenesis.
2.- Master degree in Nueroscience; Fluorescence and Fluorescent Techniques applied to neuroscience
3.- Diseases associated to mutations in connexin channels.

Administrative Work

1.- Director of the Master degree in Neuroscience, Universidad de Valparaíso. 2012-present.
2.- Committee of Bachelor in Biology and Chemistry degree, Universidad de Valparaíso. 2010-2018.
3.- Committee of: PhD in Biophysics and Computational Biology; PhD in science and engineering for health.
3.- Director of Neuroscience Institute (present)

Institutional Grants

1.- PROGRAMA MECESUP2. FONDO DE INNOVACIÓN ACADÉMICA 2008. **UVA0804**, **Consolidación Del Programa de Doctorado en Ciencias mención Neurociencias con miras a su internacionalización.** $ 181.000.000. Recursos se gastan en becas (4-5 estudiantes), movilidad estudiantil y visitas de especialistas. Director (a cargo de escritura, postulación y administración).
2.- PROGRAMA MECESUP2. FONDO DE INNOVACIÓN ACADÉMICA 2008. **UVA0805, Creación de un Laboratorio de Microscopía Avanzada de Fluorescencia.** $ 203.300.000. Se adquiere un microscopio Confocal y un microscopio TIRF laser. Director Alterno (participo en escritura y postulación).