

BIOGRAPHICAL SKETCH

NAME		POSITION TITLE	
<i>ENRIQUE BRANDAN, Ph.D.</i>		<i>Full Professor (1998)</i>	
www.brandan.cl http://biologia.uc.cl/es/cuerpo-academico/profesor/9			
<i>EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
<i>University of Chile. Faculty of Sciences</i>	<i>Master in Sciences, mention in Biology</i>	<i>(1973-1978)</i>	<i>Mainly biology plus chemistry, physics, and mathematics.</i>
<i>Vanderbilt University Laboratory of Dr. Becca Fleischer. Nashville, TN. U.S.A.</i>	<i>Research Associate,</i>	<i>(1979-1981)</i>	<i>Biochemistry of Golgi apparatus</i>
<i>Catholic University of Chile, Faculty of Biological Sciences</i>	<i>Doctor in Biological Sciences (Ph.D.), mention in Cell Biology.</i>	<i>(1981-1985)</i>	<i>Cell and Molecular Biology. Thesis: Anchorage of Acetylcholinesterase to basal lamina at the neuromuscular junction</i>
<i>E.A. Doisy Department of Biochemistry St. Louis University, School of Medicine Laboratory of Dr. Carlos B. Hirschberg St. Louis, MO. U.S.A.</i>	<i>Post-Doc. Visiting Assistant Research Professor,</i>	<i>(1986-1987)</i>	<i>Synthesis and modification of heparan sulfate proteoglycans</i>
<i>Professor, Department of Biochemistry, University of Massachusetts Medical Center, Worcester, MA. U.S.A.</i>	<i>Post-Doc. Assistant Professor</i>	<i>(1987-1989)</i>	<i>Synthesis and modification of heparan sulfate proteoglycans</i>

A. Positions and Honors.

- Assistant Professor, Department of Cell and Molecular Biology, Catholic University of Chile (1998-1993)
- Associate Professor, Department of Cell and Molecular Biology, Catholic University of Chile (1993-1998)
- Full Professor, Department of Cell and Molecular Biology, Catholic University of Chile (1998)
- National Science Foundation U.S.A. (1988-1991). Research Award
- International Foundation for Sciences. (IFS). Sweden. (1989-1997) Research Award
- Fogarty International Research Collaboration Award (FIRCA) (1993-1998) Research Award
- Volkswagen-Stiftung (1996-1998) Research Award
- Howard Hughes International Research Scholar (1997-2001) (2002-2006)
- “Best Teacher 1997” and “2007”, Alumni Association Catholic University of Chile
- Presidential Chair in Sciences (1998-2000).
- Center for Cell Regulation and Pathology (2000-2004; 2005-2009)
- Member of Academy of Sciences of Chile (2008)
- Director of Planning and Development, Faculty of Biological Sciences, Catholic University of Chile.

- Recognition to the Best Teacher, Catholic University of Chile (2012)
- Chair Department Cell and Molecular Biology, Faculty of Biological Sciences, Catholic University of Chile (2015-2017)

B. Publications:

Total of 125.

Selected peer-reviewed publications (in chronological order, since 2013).

- . Painemal P, Acuña MJ, Riquelme C, Brandan E*, Cabello-Verrugio C*. (2013) Transforming growth factor type beta 1 increases the expression of angiotensin II receptor type 2 by a SMAD- and p38 MAPK-dependent mechanism in skeletal muscle. *Biofactors*, 39, 467-75 *(Both corresponding authors)
- . Brandan, E, and Gutierrez, J. (2013) Role of proteoglycans in the regulation of skeletal muscle fibrotic response. (Invited Review). *FEBS J.* 280, 4109–4117
- . Brandan, E, and Gutierrez, J. (2013) Role of skeletal muscle proteoglycans during myogenesis. (Invited Review) *Matrix Biol.* 32, 289–297
- . Morales, G., Cabrera, D., Céspedes, C., Vio, C., Vázquez, Y., Brandan, E., and Cabello-Verrugio, C. (2013). Inhibition of angiotensin-converting enzyme decreases skeletal muscle fibrosis in dystrophic mice by a diminution on the expression and activity of connective tissue growth factor (CTGF/CCN-2). *Cell Tiss Res* 353,173-87.
- . Morales MG, Gutierrez J, Cabello-Verrugio C, Cabrera D, Lipson KE, Goldschmeding R, Brandan E. (2013). Reducing CTGF/CCN2 slows down mdx muscle dystrophy and improves cell therapy. *Hum Mol Genet.* 15, 4938-512.
- . Cisternas, P., Henríquez, J.P., Brandan, E. and Inestrosa, NC. (2014) Wnt signaling in skeletal muscle dynamics: myogenesis, neuromuscular synapse and fibrosis. *Mol. Neurobiol.* 49, 574-89.
- . Acuña MJ, Pessina P, Olguin H, Cabrera D, Vio CP, Bader M, Muñoz-Canoves P, Santos RA, Cabello-Verrugio C, Brandan E. (2014). Restoration of muscle strength in dystrophic muscle by angiotensin-1-7 through inhibition of TGF- β signalling. *Hum Mol Genet.* 23, 1237-49
- . Gutiérrez, J., Cabrera, D., and Brandan, E. (2014) Glypican-1 regulates myoblast response to HGF via met in a lipid raft-dependent mechanism: Effect on migration of skeletal muscle precursor cells. *Skeletal Muscle* 12;4(1):5. doi: 10.1186/2044-5040-4-5.
- . Cabrera, D., Gutiérrez, J. Cabello-Verrugio, C., Morales, M.G., Mezzano, S., Fadic, R., Casar, JC., Hancke, J., and Brandan, E. (2014) Andrographolide attenuates skeletal muscle dystrophy in mdx mice and increases efficiency of cell therapy by reducing fibrosis. *Skeletal Muscle* 4:6.
- . Riquelme, CA., Acuña, MJ., Torrejón, J., Rebolledo, D., Cabrera, D., Santos, RA. and Brandan, E. (2014) . ACE2 is augmented in dystrophic skeletal muscle and plays a role in decreasing associated fibrosis. *PLoS One* 2;9(4):e93449. doi: 10.1371
- . Pessina, P., Cabrera, D., Morales, MG., Riquelme, CA., Gutiérrez, J., Serrano, AL., Brandan, E.* and Muñoz-Cánoves, P*. (2014) Novel and optimized strategies for inducing fibrosis in vivo: focus on Duchenne Muscular Dystrophy. *Skeletal Muscle*, 4:7. *(Both corresponding authors)
- . Meneses, C., Morales, M.G., Abrigo, J., Simon, F., Brandan, E. and Cabello-Verrugio, C. (2014). The angiotensin (1-7)/Mas axis reduces myonuclear apoptosis during recovery from angiotensin II-induced skeletal muscle atrophy in mice. *Pflug. Arch. Eur. J. Phy.* 467, 1975-84.
- . Cisternas, F., Morales, M.G., Meneses, C., Dimon, F., Brandan, E., Abrigo, J, Vazquez Y, and Cabello-Verrugio, C. (2015) Angiotensin 1-7 Decreases Skeletal Muscle Atrophy induced by Angiotensin II through Mas Receptor-Dependent Mechanism. *Clin Sci. (Lond)* 128, 307-19.

. Cordova, G., Rochard, A., Riquelme-Guzmán, C., Cofré, C., Scherman, D., Bigey, P., and Brandan, E. (2015) SMAD3 and SP1/SP3 transcription factors collaborate to regulate Connective Tissue Growth Factor gene expression in myoblasts in response to Transforming Growth Factor β . *J. Cell. Biochem.* 116,1880-7.

. Cofre, C., Acuña, M.J., Contreras, O., Morales, M.G., Riquelme, C., Cabello-Verrugio, C. and Brandan, E. (2015) Transforming growth factor type- β inhibits Mas receptor expression in fibroblasts but not in myoblasts or differentiated myotubes; Relevance to fibrosis associated to muscular dystrophies. *BioFactors* 41, 111-20.

. Passos-Silva, D., Brandan, E. and Souza Santos, RA. (2015) Angiotensins as therapeutic targets beyond heart disease. *Trends Pharmacol. Sci.* 36, 310-320.

. Brandan, E. (2015) Heparan sulfate provides a mechanism to respond to FGFR2b and control regenerative expansion. *J Cell Commun Signal.* 9, 89.

. Morales, M.G., Abrigo, J., Acuña, M.J., Santos, R., Bader, M, Brandan, E, Simon, F., and Cabello-Verrugio, C. (2015). Ang 1-7 decreases muscle wasting by disuse. *Clin Sci (London)* In Press.

. Gutiérrez, J*., Droppelmann, CA., Contreras, O., Takahashi, C., and Brandan, E*. (2015) RECK-mediated β 1-integrin regulation by TGF- β 1 is critical for wound contraction in mice. *PLoS One* 6, 10(8):e0135005. doi: 10.1371/journal.pone.0135005. *(Both corresponding authors).

. Fuenzalida, M., Espinoza, C., Pérez, M.A. Tapia-Rojas, Ch., Cuitino, L., Brandan, E. Inestrosa, N.C. (2015) Wnt signaling pathway improves central inhibitory synaptic transmission in a mouse model of Duchenne muscular dystrophy. *Neurobiol. Dis.* 86, 109-120

. Contreras, O., Rebolledo, D.L. Oyarzún, J.E., Olguin, H. and Brandan, E. (2016) Connective tissue cells expressing fibro/adipogenic progenitors markers increase under chronic damage; Relevance to fibroblast-myofibroblast differentiation and skeletal muscle fibrosis. *Cell Tissue Res* (In press). Jan 7. [Epub ahead of print]

. Cabrera, D., Wree, A., Povero, D., Solis, N., Hernandez, A., Pizarro, A, Moshage, H., Torres, J., Feldstein, A., Cabello-Verrugio, C., Brandan, E., Barrera, F., Arab, J. Arrese, M. (2017) Andrographolide ameliorates inflammation and fibrogenesis and attenuates inflammasome activation in experimental non-alcoholic steatohepatitis. *Sci Rep.* 14;7(1):349.1doi: 10.1038/s41598-017-03675-z.

. Morales, M.G., Acuña, M.J., Cabrera, D., Goldschmeding, R and Brandan E. (2017) The pro-fibrotic connective tissue growth factor (CTGF/CCN2) correlates with the number of necrotic-regenerative foci in dystrophic muscle. *J Cell Commun Signal.* doi: 10.1007/s12079-017-0409-3.

. Gonzalez, D., Contreras, O., Rebolledo, DL., Espinoza, JP., van Zundert, B., Brandan E. (2017) ALS skeletal muscle shows enhanced TGF- β signaling, fibrosis and induction of fibro/adipogenic progenitor markers. *PLoS One* 16;12(5):e0177649. doi: 10.1371/journal.pone.0177649.

. Acuña, MJ., Salas, D., Cordova-Casanova, A., Cruz-Soca, A., Céspedes, C, Vío, C.P. and Brandan, E (2017) Blockade of Bradykinin receptors worsens the dystrophic phenotype of mdx mice: differential effects for B1 and B2 receptors. *J Cell Commun Signal.* doi: 10.1007/s12079-017-0439-x

. Riquelme-Guzmán, C., Contreras, O., and Brandan E. (2018) Expression of CTGF/CCN2 in response to LPA is stimulated by fibrotic extracellular matrix via the integrin/FAK axis. *Am. J. Physiol. Cell Physiol.* 314: C415–C427.

. Contreras, O., Villarreal, M. and Brandan, E. (2018) Nilotinib impairs skeletal myogenesis by increasing myoblast proliferation. *Skeletal Muscle* 20, 8(1):5. doi: 10.1186/s13395-018-0150-5.

. Gonzalez D, Rebolledo DL, Correa LM, Court F, Cerpa W, Lipson KE, van Zundert B, Brandan E. (2018) The inhibition of CTGF/CCN2 activity improves muscle and locomotor function in a murine ALS model. *Hum Mol Genet.* 27, 2913-2926.

. Gonzalez, D, and Brandan, E (2019) CTGF/CCN2 from skeletal muscle to the nervous system: impact on neurodegenerative diseases.

Mol. Neurobiol. In Press doi.org/10.1007/s12035-019-1490-9

. Rebolledo, D.L., González, D., Faundez-Contreras, J., Contreras, O., Murphy-Ullrich, J.E., Lipson, K.E. and Brandan, E. (2019) CTGF/CCN2 Modulates Denervation-induced Skeletal Muscle Fibrosis independently of TGF- β .

Matrix Biol. doi: 10.1016/j.matbio.2019.01.002

. Contreras, O., Cruz-Soca, M., Theret, M., Soliman, H., Groppa, H., Wei, L., , Rossi, F.M., and Brandan, E. (2019) TGF- β and PDGFR α signaling pathways cross-talk regulates stromal fibro/adipogenic progenitors' differentiation.

J. Cell Sci doi: 10.1242/jcs.232157

. Valle-Tenney R, Rebolledo D, Lipson KE, Brandan E. (2019) Role of hypoxia in skeletal muscle fibrosis: Synergism between hypoxia and TGF- β signaling upregulates CCN2/CTGF expression specifically in muscle fibers.

Matrix Biol. doi: 10.1016/j.matbio.2019.09.003

C. Research Support.

- Programa Desarrollo Naciones Unidas, PNUD. Chile, (1984-1985) **Graduate Student.**
- National Science Foundation U.S.A. (1988-1991) "Program Science in developing countries".
Principal Investigator in Chile.
- International Foundation for Sciences. (IFS). Sweden, (1989-1991)(1991-1994)(1995-1997)
Principal Investigator.
- FONDECYT National Agency for Research Support Chile, (1989-1991)(1993-1995)
(1996-1998)(2011-2014)(2015-2018) (2019-2022) **Principal Investigator.**
- Fogarty International Research Collaboration Award (FIRCA) USA, (1993-1995) (1996-1998)
(Principal Investigator, USA, Dr. David Carey). **Principal Investigator in Chile.**
- Third World Academy of Sciences (1993-1994) (Italy). **Principal Investigator.**
- Volkswagen-Stiftung (1996-1997) Germany, **Principal Investigator.**
- Presidential Chair in Sciences. Chilean Government. (1998-2001) **Principal Investigator.**
- Howard Hughes International Research Scholar, USA, (1997-2001) (2002-2006) **Principal Investigator.**
- Millennium Institute for Fundamental and Applied Biology **MIFAB**, (2000-2004) (**11 scientists**).
- Center of Cell Regulation and Pathology, Chile, (2000-2004) (2005-2009) (**5 scientists**).
- FONDEF, (2009-2012), **Principal Investigator.**
- Muscular Dystrophy Association, **MDA3790, USA, (2004-2007) (2008-2011) Principal Investigator.**
- Basal Center Aging and Regeneration, Chile, (2009-2013)(2014-2018)(2019-2021) (**7 scientists**).

C. Mentoring,

Undergraduate Thesis directed, 15, one under direction.

Graduate (Doctorate) Thesis Directed 20, three under progress.