

Curriculum Vitae

Jaime DeSantiago

WORK ADDRESS 1750 W. Harrison St. Rm 1420, 1316
Molecular Biophysics & Physiology
Rush University
Chicago, IL 60612

PLACE OF BIRTH MEXICO

MARITAL STATUS Married, Alicia; two sons: Jaime & Fredy, one daughter: Elizabeth.

CITIZENSHIP MEXICO, USA.

EDUCATION/TRAINING

1975-1982 MD School of Medicine, Autonomous University of Zacatecas, Mexico.
1986-1989 MS Physiology, Autonomous University of San Luis Potosi. Mexico.
1991-1995 PhD Physiology/Neuroscience Dept., Finch University of Health Sciences/The
Chicago Medical School (Rosalind Franklin University)

PREVIOUS EMPLOYMENT

1983-85 Private Medical Practice in Mexico.
1990-91 Research Assistant, Department of Physiology and Biophysics. Finch University of
Health Sciences/The Chicago Medical School
1995-97 Post-doctoral fellow, Department of Physiology and Biophysics. Finch University of
Health Sciences/The Chicago Medical School
1997-2008 Research Associate. Department of Physiology. Stritch School of Medicine Loyola
University Chicago.
2008-09 Assistant Project Scientist, Pharmacology Department, University of California
Davis
2009-14 Research Specialist, Department of Medicine/section of Cardiology. University of
Illinois at Chicago
2014- Scientist, Molecular Biophysics & Physiology. Rush University

FELLOWSHIPS

1986-88 MS Fellowship, National Council of Science and Technology. (CONACYT,
Mexico).
1988-89 MS Fellowship, University of San Luis Potosi, Mexico.
1991-93 PhD Fellowship, FUHS/The Chicago Medical School
1993-95 Junior Fellowship, American Heart Association Metropolitan Chicago
1997-00 Postdoctoral training (NHLBI Minority supplement program)

MEMBERSHIP IN SCIENTIFIC SOCIETIES

1991- Biophysical Society
1991- Latin American Biophysical Society (SOBLA)
1999- American Heart Association, Basic Science Council

DISSERTATIONS

"Effect of verapamil and presence of epithelial cells on guinea pig respiratory smooth muscle sensitized by albumin". Master in Sciences Dissertation. Univ. of San Luis Potosi. Mexico. December 1989.

"Transport of magnesium and calcium across the membrane of excitable cells". Doctor in Philosophy Dissertation. Finch University of Health Sciences/The Chicago Medical School. August 1995.

PUBLICATIONS

1. Rasgado-Flores H, **DeSantiago J**, Espinosa-Tanguma R.. Stoichiometry and regulation of the Na-Ca exchanger in barnacle muscle cells. *Ann. N.Y. Acad. Sci.* 1991;639:22-33
2. Espinosa-Tanguma R, **DeSantiago J**, Rasgado-Flores H. α -Chymotrypsin deregulation of the sodium-calcium exchanger in barnacle muscle Cells. *Am J Physiol.* 1993;265 (Cell Physiol 34): C1118-27.
3. Rasgado-Flores H, Gonzalez-Serratos H, **DeSantiago J**. Extracellular Mg^{2+} -dependent Efflux of Na^+ , K^+ and Cl^- in squid giant axons. *Am J Physiol.* 1994;266: (Cell Physiol. 35) C1112-7.
4. Pena-Rasgado C, Summers JC, McGruder KD, **DeSantiago J**, Rasgado-Flores H. Effect of Isosmotic Removal of Extracellular Sodium on Cell Volume and Membrane Potential in Muscle Cells. *Am J Physiol.* 1994 267 (Cell Physiol 36) C759-67.
5. Rasgado-Flores H, Espinosa-Tanguma R, Tie J, **DeSantiago J**. Voltage dependence of Na-Ca exchange in barnacle muscle cells. I. Na-Na exchange activated by alpha-chymotrypsin. *Ann NY Acad Sci.* 1996 779:236-48
6. Li L, **DeSantiago J**, Chu G, Kranias EG, Bers DM. Phosphorylation of phospholamban and troponin I in β -adrenergic mediated acceleration of cardiac relaxation. *Am J Physiol Heart Circ Physiol* 2000 Mar 278(3):H769-79.
7. **DeSantiago J**, Maier LS and Bers DM. Frequency-dependent acceleration of relaxation in the heart depends on CaMKII, but not phospholamban. *J Mol Cell Cardiol.* 2002 Aug;34(8):975-84.
8. Maier LS, Zhang T, Chen L, **DeSantiago J**, Li Y, Brown JH, Bers DM. Transgenic CaMKII- δ_C overexpression uniquely alters cardiac myocyte Ca handling: reduced SR Ca load and activated SR Ca release. *Circ Res.* 2003 May 2;92(8):904-11
9. **DeSantiago J**, Maier LS, Bers DM. Phospholamban is required for CaMKII-dependent recovery of Ca transients and SR Ca reuptake during acidosis in cardiac myocytes. *J Moll Cell Cardiol* 2004 Jan; 36(1):67-74.

10. Ji Y, Zhao W, Li B, **DeSantiago J**, Picht E, Kaetzel MA, Schultz Jel J, Kranias EG, Bers DM, Dedman JR. Targeted inhibition of sarcoplasmic reticulum CaMKII activity results in alterations of Ca homeostasis and cardiac contractility. *Am J Physiol Heart Circ Physiol*. 2006 Feb; 290(2):H599-606
11. Altamirano J, Li Y, **DeSantiago J**, Piacentino V 3rd, Houser SR, Bers DM. The inotropic effect of cardioactive glycosides in ventricular myocytes requires Na⁺/Ca²⁺ exchanger function. *J Physiol*. 2006 Sep 15;575(pt3):845-54
12. Picht E, **DeSantiago J**, Blatter LA, Bers DM. Cardiac alternans do not rely on diastolic sarcoplasmic reticulum calcium content fluctuations. *Circ Res*. 2006 Sep 29;99(7):740-8
13. Picht E, **DeSantiago J**, Huke S, Kaetzel MA, Dedman JR, Bers DM. CAMKII inhibition targeted to the sarcoplasmic reticulum inhibits frequency-dependent acceleration of relaxation and Ca²⁺ current facilitation. *J Mol Cell Cardiol*. 2007 Jan;42(1):196-205 PMID:PMC 1828135
14. **DeSantiago J**, Battle D, Khilnani M, Dedhia S, Kulczyk J, Duque R, Ruiz J, Pena-Rasgado C, Rasgado-Flores H. Ca²⁺/H⁺ exchange via the plasma membrane Ca²⁺ ATPase in skeletal muscle. *Front Biosci*. 2007 May 1;12:4641-60
15. **DeSantiago J**, Ai X, Islam M, Acuna G, Ziolo MT, Bers DM, Pogwizd SM. Arrhythmogenic effects of beta 2-adrenergic stimulation in the failing heart are attributable to enhanced sarcoplasmic reticulum Ca load. *Circ. Res*. 2008 June6;102(11):1389-97 PMID:PMC 2585979
16. Catalucci D, Zhang DH, **DeSantiago J**, Aimond F, Barbara G, Chemin J, Bonci D, Picht E, Rusconi F, Dalton ND, Peterson KL, Richard S, Bers DM, Brown JH, Condorelli G. Akt regulates L-Type Ca Channel activity by modulating Ca v alpha protein stability. *J.Cell Biol*. 2009 Mar23;184(6):923-33 PMID: PMC 2699149
17. Schaeffer PJ, **DeSantiago J**, Yang J, Flagg TP, Kovacs A, Weinheimer CJ, Courtois M, Leone TC, Nichols CG, Bers DM, Kelly DP. Impaired contractile function and calcium handling in hearts of cardiac-specific calcineurin b1-deficient mice. *Am J Physiol Hearth Circ Physiol* 2009 Oct 297(4):H1263-73. PMID:PMC 2770758
18. Nakayama H, Bodi I, Maillet M, **DeSantiago J**, Domeier TL, Mikoshiba K, Lorenz JN, Blatter LA, Bers DM, Molkenin JD. The IP3 receptor regulates cardiac hypertrophy in response to select stimuli. *Circ Res* 2010 Sep 3; 107(5):659-66. PMID: PMC2933281
19. Huke S, **DeSantiago J**, Kaetzel MA, Mishra S, Brown JH, Dedman JR, Bers DM. SR-targeted CaMKII inhibition improves SR Ca handling, but accelerates cardiac remodeling in mice overexpressing CaMKIIδC. *J Mol Cell Cardiol*. 2011 Jan; 50(1):230-8. PMID: PMC3018844
20. **DeSantiago J**, Bare DJ, Semenov I, Minshall RD, Geenen DL, Wolska BM, Banach K. Excitation-Contraction coupling in ventricular myocytes is enhanced by paracrine signaling from mesenchymal stem cells. *J Mol Cell Cardiol* 2012 Jun; 52(6):1249-56. PMID: PMC3570146

21. Neef S, Sag CM, Daut M, Baumer H, Grefe C, El-Armouche A, **DeSantiago J**, Pereira L, Bers DM, Backs J, Maier LS. While systolic cardiomyocyte function is preserved, diastolic myocyte function and recovery from acidosis are impaired in CaMKII δ -KO mice. *J Mol Cell Cardiol* 2013 Jun; 59:107-16. PMID:PMC3738196
22. **DeSantiago J**, Bare DJ, Ke Y, Sheehan KA, Solaro RJ, Banach K. Functional integrity of the T-tubular system in cardiomyocytes depends on p21-activated kinase 1. *J Mol Cell Cardiol* 2013 Jul;60:121-8 PMID:PMC 3679655
23. **DeSantiago J**, Bare DJ, Banach K. Ischemia-Reperfusion injury protection by mesenchymal stem cell derived antioxidant capacity. *Stem Cells Dev.* 2013 Sep15;22(18):2497-507. PMID: PMC3760058
24. Taglieri DM, Johnson KR, Burmeister BT, Monasky MM, Splinder MJ, **DeSantiago J**, Banach K, Conklin BR, Carnegie GK. The C-terminus of the long AKAP13 isoform (AKAP-Lbc) is critical for development of compensatory cardiac hypertrophy. *J Mol Cell Cardiol* 2014 Jan;66:27-40
25. **DeSantiago J**, Bare DJ, Xiao L, Ke Y, Solaro RJ, Banach K. p21-activated kinase 1 (Pak1) is a negative regulator of NADPH-oxidase 2 in ventricular myocytes. *J Mol Cell Cardiol* 2014 Feb;67:77-85. PMID:PM3930036

ABSTRACTS

1. DeSantiago, J., Modak, R., Gonzalez-Serratos, H., and Rasgado-Flores, H. (1992). Coupled fluxes of sodium, magnesium and manganese in barnacle muscle cells. *Biophys. J.*, 61:A390.
2. Espinosa-Tanguma. R, DeSantiago, J., and Rasgado-Flores, H. (1992). α -Chymotrypsin deregulation of the Na/Ca exchanger in barnacle muscle cells. *Biophys. J.*, 61:A388.
3. PenaRasgado, C., Summers, J.C, McGruder, K.D, DeSantiago, J., and Rasgado-Flores, H. (1994). Effect of Isosmotic Removal of Extracellular Sodium on Cell Volume and Membrane Potential in Barnacle Muscle Cells *Biophys. J.*, 66:A215.
4. Tie,J., Espinosa-Tanguma, R., DeSantiago, J., and Rasgado-Flores, H. (1995). Voltage-dependence of the regulated and deregulated Na/Ca exchanger in muscle cells. *Biophys. J.*, 68:A413.
5. DeSantiago, J., Batlle, D., Dedhia, S., and Rasgado-Flores, H. (1995). Ca²⁺ efflux is activated by extracellular protons and inhibited by cadmium in muscle cells: evidence for Ca²⁺/H⁺ exchange *via* the Ca²⁺ pump. *Biophys.J.*, 68:314
- 6.-Tie,J. Ajaga,S. Espinosa-Tanguma,R. DeSantiago J., and Rasgado-Flores H. (1997) Voltage-dependence of the various modes of exchange mediated by the regulated and deregulated Na/Ca exchanger in muscle cells. *Biophys. J.* 72:A65
- 7.-DeSantiago J., Li Y., Schlotthauer K., and Bers DM. (1998) Phenylephrine induced inotropy is not associated with IP3 induced Ca release in ventricular myocytes. *Biophys. J* 74:A57

- 8.-Altamirano J., DeSantiago J., and Bers DM. (1999) The inotropic effect of acetylcholine and digoxin in ferret ventricular myocytes requires Na/Ca exchanger function. Biophys. J. 76:A300
- 9.-DeSantiago J., Li L., and Bers DM. (1999) Cardiac troponin I phosphorylation is only important in PKA-induced acceleration of relaxation when force is developed. Biophys. J. 76:A461
- 10-DeSantiago J. and Bers DM (2000) CaMKII inhibitor prevents the frequency-dependent acceleration of relaxation in cardiac muscle of phospholamban knock-out mice. Biophys. J. 78:A375.
- 11-DeSantiago J., Bers DM, (2001) CaMKII inhibitory peptide limits frequency-dependent acceleration of relaxation (FDAR) in rat myocytes. Biophys. J. 80:589a,
- 12-Maier, L.S., T. Zhang, L. Chen, J. DeSantiago, Y. Li, J. Heller Brown and D.M. Bers.(2002) Cardiac overexpression of CaMKII δ C alters calcium handling in isolated myocytes. Circulation 106:II-, 2002.
- 13.DeSantiago J., Maier L., Bers DM.(2003) Recovery of Ca transients and SR Ca reuptake during acidosis in cardiac myocytes requires phospholamban (PLB). Biophys. J. 84:476, 2003
- 14.DeSantiago J, Islam M, Ziolo MT, Bers DM, Pogwizd SM.(2003) Arrhythmogenic effects of betha 2-adrenergic stimulation in the failing heart are due to enhanced SR Ca load. Circulation 2003; Abs 251
- 15.DeSantiago J., Maier L., Bers DM.(2004) CaMKII-dependent phospholamban phosphorylation is responsible for increased SR Ca content during acidosis in cardiac myocytes. Biophys. J. 86:237, 2004
- 16.Picht E, DeSantiago J, Dedman JR, Bers DM.(2004) CaMKII inhibitor targeted to phospholamban inhibits frequency-dependent acceleration of relaxation and, surprisingly, Ca current facilitation. Circulation 2004, Abs 620
17. Picht E, DeSantiago J, Blatter LA, Bers DM. (2006) Cardiac alternans do not rely on diastolic sarcoplasmic reticulum calcium content fluctuations. Biophys J. Vol 90, Jan 2006, Abs 20-plat
18. DeSantiago J, Picht E, Huke S, Kaetzel MA, Dedman JR, Bers DM. (2006) SR-targeted inhibition of CaMKII activity decreases both SR Ca uptake and leak in cardiac myocytes. Biophys J. Vol 90, Jan 2006 , 336 pos
19. Huke S, DeSantiago J, Kaetzel MA, Picht E, Brown JH, Dedman JR, Bers DM. (2008) Co-expression of SR-targeted AIP improves SR Ca handling in CaMKII delta c overexpressing mice, but cardiac remodeling is accelerated Biophys J. Vol: Feb 2008 , 1484 pos
20. DeSantiago J, Zima A, Domeier T, Ginsburg K, Molkenin , Blatter L, Bers DM. (2009) IP3 receptor –mediated Ca release facilitates RyR-Ca release to cause inotropy and arrhythmogenicity in mouse Ventricular Myocytes. Biophys J. Vol , Feb 2009 , 2776 pos
21. Bare D, DeSantiago J, Semenov I, Banach K. (2010) Bone Marrow Derived Stem cells improve cardiomyocyte survival and excitation-contraction coupling through paracrine signaling. Biophys. J. Feb 2010

22. DeSantiago J, Bare JD, Banach K. (2012) Ischemia Reperfusion induced arrhythmia are prevented by mitochondrial IK_{ATP} opening by mesenchymal stem cell paracrine factors. *Biophys J* Vol 102 issue 3, p166a
23. DeSantiago J, Bare JD, Sheehan KA, Ke Y, Solaro J, Banach K.(2012) P21-activated kinase (Pak1) is a direct modulator of cardiac excitation-contraction coupling gain. *Biophys J* Vol 102 issue 3, p512a
24. DeSantiago J, Bare JD, Ke Y, Solaro J, Banach K. (2013) p21 activated kinase (Pak1) is a negative regulator of ROS generation in ventricular myocytes. *Biophys J* Feb 2013
25. DeSantiago J, Bare JD, Ke Y, Solaro J, Avitall B, Arora R, Banach K. (2014) Increased risk of atrial fibrillation with attenuated activity of p-21 activated kinase. *Biophys J* vol 106, issue 2, p323a

SCIENTIFIC MEETINGS (Attended)

- Annual Meeting of the Mexican Society of Physiology, Queretaro, Mexico.(1988).
- Second International Conference on Sodium/Calcium Exchange, Baltimore, MD(1991)
- Biophysical Meeting, Houston, TX (1992).
- Seventh Annual Meeting Ohio Physiological Society, Wright State University, Dayton, Ohio. (1992).
- Gordon Conference on Magnesium Regulation, Oxnard, CA (1993).
- Biophysical Meeting, New Orleans, LA (1994).
- Biophysical Meeting, San Francisco, CA (1995).
- 36th Annual National Student Research Forum. Univ. of Texas Medical Branch at Galveston (1995).
- Third International Conference on Sodium-Calcium Exchange, The Marine Biological Laboratory Woods Hole, Massachusetts (1995).
- First Annual Meeting of the Midwest Physiological Society. Medical College of Wisconsin. Milwaukee, (June, 1996).
- Midwestern Combined Annual Meeting (Central Society for clinical Research). Chicago, Il. (Sep. 1996).
- Biophysical Meeting, Kansas City, MO (1998).
- Biophysical Meeting, Baltimore, MD (1999).
- 4th Annual Meeting of Midwest Physiological Societies. University of Wisconsin-Madison.(June,1999).
- American Heart Association National Meeting. Atlanta (1999)
- Biophysical Meeting, New Orleans (2000).
- Biophysical Meeting. Boston (2001)
- Biophysical meeting. San Francisco (2002)
- American Heart Association National Meeting. Chicago, IL (2002)
- Biophysical Meeting. San Antonio TX. (2003)
- American Heart Association National Meeting. Orlando, FL (2003)
- Biophysical Meeting Baltimore MD (2004)
- Biophysical Meeting Salt Lake City, UT (2006)

- American Heart Association National Meeting Chicago, IL (2006)
- Biophysical Meeting Baltimore MD (2007)
- Biophysical Meeting Long Beach CA (2008)
- Biophysical Meeting Boston (2009)
- Biophysical Meeting San Francisco (2010)
- International Society for heart Research (ISHR) (2011)
- Biophysical Meeting San Diego (2012)
- Biophysical Meeting Philadelphia (2013)
- Biophysical Meeting San Francisco (2014)

RESEARCH SUPPORT (completed)

Title: Regulation of Intracellular Magnesium in Muscle Cells.
 Granting Agency: American Heart Association of Metropolitan Chicago (Jr Fellowship)
 Amount: 40 000.00
 Project period: 07-01-93 to 06-30-95
 Principal Investigator: Jaime DeSantiago
 Status: Completed

Title: Ionic Control of Cardiac Muscle Contraction.
 Granting Agency: NHLBI Minority Supplement Program (Postdoctoral Training)
 Amount: 100 144.00
 Project period: 09-01-97 to 02-28-00
 Principal Investigator: Donald M. Bers, PhD. Project Grant HL30077
 Status: Completed