

CURRICULUM VITAE

PERSONAL INFORMATIONS:

name: Giulietta Di Benedetto

ORCID ID: 0000-0002-1489-3896

date of birth: October 11th, 1971

career breaks: March-August 2002; April-August 2006 (maternity leaves)

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EDUCATION:

2001 PhD in Genetics, Department of Biology, University of Ferrara. Thesis title: "Genetic variability in the eastern Italian Alps: ancient DNA, mitochondrial DNA and Y chromosome"

1996-1997 Postgraduate laboratory training

1996 Degree in Biology, University of Padova. Thesis title: "Transformation of Drosophila embryos with a chimeric Drosophila-Musca clock gene"

1990 Degree, High School, Liceo Classico C. Marchesi, Padova

POSITIONS and EMPLOYEMENT:

2010-present Researcher, CNR - Neuroscience Institute

2009 Post doctoral fellow, VIMM (Veneto Institute of Molecular Medicine), Padova. Title of the project: "cAMP dynamics involving mitochondria". Supervisor: Prof. Tullio Pozzan

2003-2008 Post doctoral fellow, VIMM (Venetian Institute of Molecular Medicine), Padova. Title of the project: "Anchored cAMP signalling – Implications for treatment of human disease". Supervisor: Dr. Manuela Zaccaro

2001-2003 Post doctoral fellow, Department of Biomedical Sciences, University of Padova. Title of the project: "Mechanisms and biological roles of the heterogeneity of mitochondrial calcium accumulation".

Supervisor: Prof. Tullio Pozzan

1997-2000 PhD student, Genetics, Department of Biology, University of Ferrara. Supervisor: Prof. Guido Barbujani

1997 Research fellow, Zoological Institute, University of Munich, Germany. Supervisor: Prof. Svante Pääbo

1996-1997 Internship, Department of Biology, University of Padova. Supervisor: Prof. Rodolfo Costa

1993 Visiting student, Erasmus project, Université Paris-Sud, Orsay Cedex, France

FELLOWSHIPS:

2009 Collaboration fellowship from the University of Padova, Dept. of Biomedical Sciences

2003-2008 Research fellowship from the Fondazione Telethon

2001-2003 Collaboration fellowship from the Italian Ministry of University, Scientific and Technological Research (M.U.R.S.T.)

1997-2000 PhD fellowship from the Italian Ministry of University, Scientific and Technological Research (M.U.R.S.T.)

1996-1997 Fellowship from the Museo Tridentino di Scienze Naturali, Trento

EVALUATION EXPERIENCE: Review panel member of the following journals: BBA-Molecular Cell Research; BBA-Molecular Basis of Disease; BBA-Bioenergetics; FEBS Letters; Plos ONE; Frontiers in Oncology.

RESEARCH

RESEARCH ACTIVITIES:

Investigation of the interaction between mitochondria and endoplasmic reticulum, measuring spatio-temporal Ca²⁺ dynamics in living cells with the combined use of the Ca²⁺-sensitive photoprotein aequorin and genetically encoded, GFP-based, Ca²⁺ sensors.

Development of a mitochondrial fluorescent pH indicator with high sensitivity in the alkaline range.

Development of several FRET-based cAMP biosensors targeted to different subcellular locations. Studies on the mechanisms generating cAMP subcellular compartments, and of the role of cAMP compartmentation in the cell pathophysiology, particularly in the heart.

Development of a cAMP biosensor targeted to the mitochondrial matrix, and studies on mitochondrial cAMP generation and functions.

Demonstration of the mitochondrial localization of the neurodevelopmental transcription factor Foxg1.

Studies on the mechanisms generating PKA-dependent signalling compartments, focusing on the role of phosphatases.

ACTUAL RESEARCH INTERESTS:

Intracellular signalling and signal compartmentalization
Mitochondrial signalling and biology

PEER-REVIEWED PUBLICATIONS (*equal contribution; #correspondence)

Di Benedetto G#, Iannucci L., Surdo N.C., Zanin S., Conca F., Grisan F., Gerbino A., Lefkimiatis K. Compartmentalized signalling in ageing and neurodegeneration. **Cells**, in press (2021)

Grisan F., Iannucci L., Zanin S., Surdo N.C., Gerbino A., Di Benedetto G, Pozzan T., Lefkimiatis K. PKA compartmentalization links cAMP signalling and autophagy. **Cell Death Diff**, in press (2021)

Di Benedetto G#, Lefkimiatis K, Pozzan T. The basics of mitochondrial cAMP signalling: when, where, why. **Cell calcium** 93, 102320 (2021)
PMID: 33296837

Herkenne S, Ek O, Zamberlan M, Pellattiero A, Chergova M, Chivite I, Novotná E, Rigoni G, Fonseca TB, Samardzic D, Agnellini A, Bean C, Di Benedetto G, Tiso N, Argenton F, Viola A, Soriano ME, Giacomello M, Ziviani E, Sales G, Claret M, Graupera M, Scorrano L. Developmental and Tumor Angiogenesis Requires the Mitochondria-Shaping Protein Opa1. **Cell Metab** 31(5):987-1003 (2020)
PMID: 32315597

Lefkimiatis K, Grisan F, Iannucci LF, Surdo NC, Pozzan T, Di Benedetto G#. Mitochondrial communication in the context of aging. **Ageing Clin Exp Res**. 2020 Jan 10. doi: 10.1007/s40520-019-01451-9. Online ahead of print. (2020)
PMID: 31925726

Grisan F, Burdyga A, Iannucci LF, Surdo NC, Pozzan T, Di Benedetto G, Lefkimiatis K. Studying β_1 and β_2 adrenergic receptor signals in cardiac cells using FRET-based sensors. **Prog Biophys Mol Biol**. 154:30-38 (2020)
PMID: 31266653

Russo I, Di Benedetto G, Kaganovich A, Ding J, Mercatelli D, Morari M, Cookson MR, Bubacco L, Greggio E. Leucine-rich repeat kinase 2 controls protein kinase A activation state through phosphodiesterase 4. **J Neuroinflammation**. 15(1):297 (2018)
PMID: 30368241

Pozdniakova S, Guitart-Mampel M, Garrabou G, Di Benedetto G, Ladilov Y, Regitz-Zagrosek V. 17β -Estradiol reduces mitochondrial cAMP content and cytochrome oxidase activity in a phosphodiesterase 2-dependent manner. **Br J Pharmacol**. 175(20):3876-3890 (2018).
PMID:30051530

Burdyga A, Surdo N, Monterisi S, Di Benedetto G, Grisan F, Penna L, Pellegrini L, Bortolozzi M, Swietach P, Pozzan T, Lefkimiatis K. Phosphatases control PKA dependent functional microdomains at the outer mitochondrial membrane. **Proc Natl Acad Sci U S A**, 115(28):E6497-E6506 (2018)
PMID:29941564

Di Benedetto G, Gerbino A, Lefkimiatis K. Shaping mitochondrial dynamics: The role of cAMP signalling. **Biochem Biophys Res Commun**. 500(1):65-74 (2018)
PMID:28501614

Suofu Y, Li W, Jean-Alphonse FG, Jia J, Khattar NK, Li J, Baranov SV, Leronni D, Mihalik AC, He Y, Cecon E, Wehbi VL, Kim J, Heath BE, Baranova OV, Wang X, Gable MJ, Kretz ES, Di Benedetto G, Lezon TR, Ferrando LM, Larkin TM, Sullivan M, Yablonska S, Wang J, Minnigh MB, Guillaumet G, Suzenet F, Richardson RM, Poloyac SM, Stolz DB, Jockers R, Witt-Enderby PA, Carlisle DL, Vildardaga JP, Friedlander RM. Dual role of mitochondria in producing melatonin and driving GPCR signaling to block cytochrome c release. **Proc Natl Acad Sci U S A**, 114(38):E7997-E8006 (2017)
PMID:28874589

Pozzobon T, Facchinello N, Bossi F, Capitani N, Benagiano M, Di Benedetto G, Zennaro C, West N, Codolo G, Bernardini M, Baldari CT, D'Elis MM, Pellegrini L, Argenton F, de Bernard M. Treponema

pallidum (syphilis) antigen TpF1 induces angiogenesis through the activation of the IL-8 pathway. **Sci Rep**, 6:18785 (2016)
PMID:26728351

L. Pancrazi*, G. Di Benedetto*, L. Colombaioni, G. Della Sala, G. Testa, F. Olimpico, A. Reyes, M. Zeviani, T. Pozzan, M. Costa. Foxg1 localizes to mitochondria and coordinates cell differentiation and bioenergetics. **Proc Natl Acad Sci U S A**, 112(45):13910-5 (2015)
PMID:26508630

Katona D., Rajki A., Di Benedetto G., Pozzan T., Spät A. Calcium-dependent mitochondrial cAMP production enhances aldosterone secretion. **Mol Cell Endocrinol**, 412: 196-204 (2015).
PMID:25958040

Di Benedetto G., Pendin D., Greotti E., Pizzo P., Pozzan T. Ca²⁺ and cAMP crosstalk in mitochondria. **J Physiol**, 592(Pt 2):305-12 (2014)
PMID:23858012

Di Benedetto G#., Scalzotto E., Mongillo M., Pozzan T. Mitochondrial Ca²⁺ uptake induces cAMP generation in the matrix and modulates organelle ATP levels. **Cell Metab** 17(6):965-75 (2013)
PMID:23747252

Mohamed T., Oceandy D., Zi M., Prehar S., Alatwi N., Wang Y., Shaheen M., Abou-Leisa M. Schelcher C., Hegab Z., Baudoin F., Emerson M., Mamas M., Di Benedetto G., Zaccolo M., Lei M., Cartwright E., Neyses L. Plasma membrane calcium pump (PMCA4)/neuronal nitric oxide synthase complex regulates cardiac contractility through modulation of a compartmentalized cyclic nucleotide microdomain, **J Biol Chem** 286 (48): 41520-9 (2011)
PMID:21965681

Gomes L.C., Di Benedetto G., Scorrano L. Essential amino acids and glutamine regulate induction of mitochondrial elongation during autophagy. **Cell Cycle**, 10(16):2635-39 (2011)
PMID:21811092

Gomes L.C., Di Benedetto G., Scorrano L. During autophagy mitochondria elongate, are spared from degradation and sustain cell viability. **Nat Cell Biol** 13(5):589-98 (2011)
PMID:21478857

Oliveira R.F., Terrin A, Di Benedetto G., Cannon R.C., Koh W., Kim M., Zaccolo M., Blackwell K. T. The Role of Type 4 Phosphodiesterases in Generating Microdomains of cAMP: Large Scale Stochastic Simulations. **PLoS One** 5(7):e11725 (2010)
PMID:20661441

Röder I.V., Lissandron V., Martin J., Petersen Y., Di Benedetto G., Zaccolo M. and Rüdiger R. PKA microdomain organisation and cAMP handling in healthy and dystrophic muscle *in vivo*. **Cell signalling** 21 (5): 819-26 (2009)
PMID:19263518

Di Benedetto G., Zoccarato A., Lissandron V., Terrin A., Li X., Houslay M.D., Baillie G., Zaccolo M. Protein Kinase A Type I and Type II Define Distinct Intracellular Signalling Compartments. **Circ Res** 103 (8): 836-44 (2008)
PMID:18757829

C. G. Tocchetti, W. Wang, J. P. Froehlich, S. Huke, M. A. Aon, G. M. Wilson, G. Di Benedetto, B. O'Rourke, W. Dong Gao, D. A. Wink, J. P. Toscano, M. Zaccolo, D. M. Bers, H. H. Valdivia, H. Cheng, D. A. Kass, N. Paolocci. Nitroxyl Improves Cellular Heart Function by Directly Enhancing Cardiac Sarcoplasmic Reticulum Ca²⁺ Cycling. **Circ Res** 100 (1): 96-104 (2007)
PMID:17138943

Dal Molin F., Tonello F., Ladant D., Zornetta I., Zamparo I., Di Benedetto G., Zaccolo M., Montecucco C. Cell entry and cAMP imaging of anthrax edema toxin. **EMBO J.** 25 (22): 5405-13 (2006)
PMID:17082768

A. Terrin*, G. Di Benedetto*, V. Pertegato, Y.-F. Cheung, G. Baillie, M.J. Lynch, N. Elvassore, A. Prinz, F.W. Herberg, M.D. Houslay, and M. Zaccolo. PGE₁ stimulation of HEK293 cells generates multiple contiguous domains with different [cAMP]: role of compartmentalized phosphodiesterases. **J Cell Biol** 175 (3): 441-451 (2006)

PMID:17088426

Zaccolo M., Di Benedetto G., Lissandron V., Mancuso L., Terrin A., Zamparo I. Restricted diffusion of a freely diffusible second messenger: mechanisms underlying compartmentalized cAMP signaling. **Biochem Soc Trans** 34: 495-7 (2006)

PMID:16856842

Zaccolo M., Cesetti T., Di Benedetto G., Mongillo M., Lissandron V., Terrin A., Zamparo I. Imaging the cAMP-dependent signal transduction pathway. **Biochem Soc Trans** 33 (Pt6): 1323-6 (2005)

PMID:16246109

Pinton P., Leo S., Wieckowski M. R., Di Benedetto G., Rizzuto R. Long-term modulation of mitochondrial Ca²⁺ signals by protein kinase C isozymes. **J Cell Biol** 165 (2):223-32 (2004)

PMID:15096525

Cano Abad M.F.*, Di Benedetto G.*, Magalhaes P.J., Filippin L., Pozzan T. Mitochondrial pH monitored by a new engineered GFP mutant. **J Biol Chem** 279 (12): 11521-9 (2004)

PMID:14701849

Filippin L., Magalhaes P.J., Di Benedetto G., Colella M., Pozzan T. Stable interactions between mitochondria and endoplasmic reticulum allow rapid accumulation of calcium in a subpopulation of mitochondria. **J Biol Chem** 278 (40): 39224-34 (2003)

PMID:12874292

Vernesi C., Di Benedetto G., Caramelli D., Secchieri E., Katti E., Malaspina P., Novelletto A., Terribile Wiel Marin A. and Barbujani G. Genetic characterization of the body attributed to the evangelist Luke. **Proc Natl Acad Sci USA** 98 (23): 13460-63 (2001)

PMID:11606723

G. Di Benedetto, A. Erguven, M. Stenico, L. Castri, G. Bertorelle, I. Togan, G. Barbujani. DNA diversity and population admixture in Anatolia. **Am J Phys Anthropol** 115(2):144-56 (2001)

PMID:11385601

Barbujani G., Di Benedetto G. "Genetic variances within and between human groups" in Donnelly P, Foley RA (eds) **Genes, fossils and behaviour: an integrated approach to human evolution**. IOS Press, Amsterdam, The Netherlands, pp 63-97

G. Di Benedetto, I.S. Nasidze, M. Stenico, L. Nigro, M. Krings, M. Lanzinger, L. Vigilant, M. Stoneking, S. Paabo and G. Barbujani. Mitochondrial DNA sequences in prehistoric human remains from the Alps. **Eur J Hum Genet** 8, 669-677 (2000)

PMID:10980572