

Sara Pahlavan

Royan Institute for Stem Cell Biology and Technology

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PERSONAL DETAILS

Gender: Female

Birthdate: 15th of July 1981

Birthplace: Damavand, Iran

Marital status: Single

Present citizenship: Iranian

EDUCATION

1995-1999 High School Diploma in Biological Science, Tehran, Iran

1999-2003 B.Sc. In Biology, University of Agricultural Sciences of Gorgan, Golestan, Iran

2003-2005 M.Sc. in Animal physiology, Shiraz University, Shiraz, Iran

2009-2012 Ph.D., Saarland University, Homburg (Saar), Germany

2012-2014 Postdoctoral fellow, Medical University of South Carolina, USA

2015-2017 Postdoctoral fellow, Royan Institute for Stem Cell Biology and Technology, Iran

2017-now Assistants Professor, Royan Institute for Stem Cell Biology and Technology, Iran

RESEARCH INTERESTS

I am very much interested in using induced pluripotent stem cells (iPSCs)-derived cardiomyocytes (CMs) for modeling channelopathies and cardiomyopathies. Patient-specific iPSCs-derived CMs enable us to study heart diseases *in vitro*. I am particularly interested in studying ion channels and Ca²⁺ machinery in patient-specific iPSCs-derived CMs in order to better understand the underlying mechanisms for development of channelopathies and cardiomyopathies. Furthermore, I am interested in using patient-specific iPSCs-derived CMs as an *in vitro* model for personalized drug testing.

PUBLICATIONS

2007 Monsefi, M., **Pahlavan, S.** Effects of Aqueous Extract of *Anethum graveolens* (L.) On Male Reproductive System of Rats. *J Biol Sci.* 2007;7(5):815-8

2012 Tian, Q., **Pahlavan, S.**, Oleinikow, K., Jung, J., Ruppenthal, S., Scholz, A., Schumann, C., Kraegeloh, A., Oberhofer, M., Lipp, P., Kaestner, L. Functional and morphological preservation of adult ventricular myocytes in culture by sub-micromolar cytochalasin D supplement. *J Mol Cell Cardiol.* 2012 Jan;52(1):113-24

2012 **Pahlavan, S.**, Oberhofer, M., Sauer, B., Ruppenthal, S., Tian, Q., Scholz, A., Kaestner, L., Lipp, L. *Gαq* and *Gα11* contribute to the maintenance of cellular electrophysiology and Ca²⁺ handling in ventricular cardiomyocytes. *Cardiovasc Res.* 2012 Jul 1;95(1):48-58

2012 Blaich, A., **Pahlavan, S.**, Tian, Q., Oberhofer, M., Poomvanicha, M., Lenhardt, P., Domes, K., Wegener, JW., Moosmang, S., Ruppenthal, S., Scholz, A., Lipp, P., Hofmann, F. Mutation of the CaV1.2 IQ Motif to CaV1.2 EQ induces dilated Cardiomyopathy and Death. *J Biol Chem.* 2012 Jun 29;287(27):22616-25

2015 Shabani P, Ghazizadeh Z, **Pahlavan S**, Hashemizadeh S, Baharvand H, Aghdami N, Doosti M. Exogenous treatment with eicosapentaenoic acid supports maturation of cardiomyocytes derived from embryonic stem cells. *Biochem Biophys Res Commun.* 2015 May 29;461(2):281-6

2015 Talkhabi M, **Pahlavan S**, Aghdami N, Baharvand H. Ascorbic acid promotes the direct conversion of mouse fibroblasts into beating cardiomyocytes. *Biochem Biophys Res Commun.* 2015 Aug 7;463(4):699-705

2015 Fonoudi H, Ansari H, Abbasalizadeh S, Rezaei Larijani M, Kiani S, Hashemizadeh S, Sharifi Zarchi A, Bosman A, Blue G.M, **Pahlavan S**, Perry M, Orr Y, Mayorchak Y, Vandenberg J, Talkhabi M, Winlaw D.S, Harvey R.P, Aghdami N, Baharvand H. A Universal and Robust Integrated Platform for the Scalable Production of Human Cardiomyocytes from Pluripotent Stem Cells. *Stem Cells Translational Medicine*, 2015 Dec;4(12):1482-94

2017 **Pahlavan S**, Morad M. Total internal reflectance fluorescence imaging of genetically engineered ryanodine receptor-targeted Ca²⁺ probes in rat ventricular myocytes. *Cell Calcium.* 2017 Sep;66:98-110

2017 Meyfour A, Ansari H, **Pahlavan S**, Mirshahvaladi S, Rezaei-Tavirani M, Gourabi H, Baharvand H, Salekdeh GH. Y Chromosome Missing Protein, TBL1Y, May Play an Important Role in Cardiac Differentiation. *J Proteome Res.* 2017 Aug 30. doi: 10.1021/acs.jproteome.7b00391. [Epub ahead of print]

2017 Meyfour A, Pooyan P, **Pahlavan S**, Rezaei-Tavirani M, Gourabi H, Baharvand H, Salekdeh GH. Chromosome-Centric Human Proteome Project Allies with Developmental Biology: A Case Study of the Role of Y Chromosome Genes in Organ Development. *J Proteome Res.* 2017 Oct 11. doi: 10.1021/acs.jproteome.7b00446. [Epub ahead of print]

2017 Sarah Rajabi, **Sara Pahlavan**, Mohammad Kazemi Ashtiani, Hassan Ansari, Saeed Abbasalizadeh, Forough Azam Sayahpour, Fahimeh Varzideh, Sawa Kostin, Nasser Aghdami, Thomas Braun, Hossein Baharvand. Human embryonic stem cell-derived cardiovascular progenitor cells efficiently colonize in bFGF-tethered natural matrix to construct contracting humanized rat hearts. *Biomaterials*, 2017.

2017 **Pahlavan S**, Tousi MS, Ayyari M, Alirezalu A, Ansari H, Saric T, Baharvand H. Effects of hawthorn (*Crataegus pentagyna*) leaf extract on electrophysiologic properties of cardiomyocytes derived from human cardiac arrhythmia-specific induced pluripotent stem cells. *FASEB J.* 2017 Nov 13. pii: fj.201700494RR.

CONFERENCE ABSTRACTS

2010 Hammer, K., Scholz, A., Tian, Q., **Pahlavan, S.**, Ruppenthal, S., Oberhofer, M., Kaestner, L., Lipp, P. Influence of Cytochalasin D on Morphology and Physiology of Rat Cardiac Myocytes. 2010, *Acta Physiologica*, Vol. 198, Supplement 677: P-SUN-87

2011 Kaestner, L., Tian, Q., **Pahlavan, S.**, Oleinikow, K., Ruppenthal, S., Scholz, A., Oberhofer, M., Schumann, C., Kraegeloh, A., Lipp, P. The Differential Action of Cytochalasin D in T-tubular Remodelling of Ventricular Myocytes. 2011 Biophysical Society Meeting Abstracts, *Biophys. J.*, Vol. 100(3), Supplement, pp.292-3a

2011 Tian, Q., **Pahlavan, S.**, Ruppenthal, S., Scholz, A., Wiesen, K., Oberhofer, M., Kaestner, L., Lipp, P. Alterations of Membrane Currents, Contractility and Calcium Signaling in Gq/G11 Single and Double KO Mice. 2011 Biophysical Society Meeting Abstracts, *Biophys. J.*, Vol. 100(3), Supplement, pp.517a

2011 **Pahlavan, S.**, Wiesen, K., Oberhofer, M., Kaestner, L., Lipp, P. The Electrophysiological Effects of Chronic Application of Aldosterone on Ventricular Myocytes of Gq/11 Knockout Mice. 2011, *Acta Physiologica*, Vol. 201, Supplement 682: P021

2012 **Pahlavan, S.**, Sauer, B., Wiesen, K., Oberhofer, M., Kaestner, L., Lipp, P. $G\alpha Q/G\alpha 11$ Modulate Aldosterone Mediated Electrical Remodeling and Ca^{2+} Handling Alterations in Ventricular Myocytes. 2012 Biophysical Society Meeting Abstracts, *Biophys. J.* Vol. 102(3), Supplement, pp.340a

2012 **Pahlavan, S.**, Oberhofer, M., Lipp, P. Excitation-Contraction Coupling Alterations in Ventricular Myocytes of RacET Mice. 2012, *Acta Physiologica*, Vol. 204, Supplement 689: P186

2013 Lipp P, Wiesen K, **Pahlavan S**, Oberhofer M, Kaestner L, Weissgerber P, Freichel M, Flockerzi V. Excision of the *Cacnb2* Gene in Mice Results in Augmented SR- Ca Release and Impaired Cardiac Function In Vivo. *Biophys. J.* Volume 104, Issue 2, Supplement 1, p40a, 29 January 2013

2014 **Pahlavan, S.**, Yang, Y., Robertson, C., Yamaguchi, N., Cleemann, L., Morad, M. A new Ca^{2+} probe, Calstabi-Cam, targeted to ryanodine receptors of cardiomyocytes. 2014 Biophysical Society Meeting Abstracts

2016 F Varzideh, H Ansari, **S Pahlavan**, N Aghdami, H Baharvand. The generation of beating multicell-type cardiac organoids by coculture of hPSC-CPCs with HUVECs and hPSC MSCs in 3D culture. 2016, ISSCR and ESGCT joint symposium abstracts, A74

2016 S Gholami, **S Pahlavan**, H Ansari, N Aghdami, H Baharvand. Human induced pluripotent stem cell-derived cardiomyocytes as an in vitro model to study molecular, cellular and functional phenotype of systemic scleroderma in the heart. 2016, ISSCR and ESGCT joint symposium abstracts, A102

2016 **Pahlavan S**, Ayyari M, Alirezalu A, Tousi MS, Ansari H, Baharvand H. Effects of *Crataegus pentagyna* on cardiomyocytes (CMs) differentiated from CPVT1 patient-derived induced pluripotent stem cells (iPSCs). *Planta Med* 2016; 82(S 01): S1-S381

RESEARCHES AND AWARDS

2012 **DAAD** scholarship to study ion currents in $Gq/G11$ knockout mice

2004 “Effect of regional changes to shell conductance on oxygen consumption and growth of chicken embryos”

2004 “Study of Effects of *Anethum graveolens* Seed Aqueous Extract On The Reproductive System of Adult Male Rats” (Thesis)

2009 “Preservation of action potential of adult rat ventricular myocytes in culture by sub-micromolar cytochalasin D supplement”

2010 “Action potential, potassium currents and their modulation by Gq -signaling pathway in the mouse ventricular myocytes”

2010 “Study of Excitation-Contraction Coupling gain and its alteration upon Mutation of the $CaV1.2$ IQ Motif to $CaV1.2$ EQ in ventricular myocyte”

2011 “Study of hyperaldosteronism induced electrical remodelling in the ventricular myocytes of wildtype and Gq/G11 knockout mice”

2011 “Study of Excitation-Contraction Coupling gain in ventricular myocytes of transgenic mice expressing RacET”

2011 “Study of Gadolinium-sensitive current in TRPC1/C4 knockout mice”

2012 “Study of $I_{Ca,L}$ in adult mice with inducible cardiomyocyte-specific excision of the cacnb2 gene”

2013 “Study of mitochondrial Ca^{2+} signaling in cardiomyocytes using a genetically-encoded Ca^{2+} probe targeted into mitochondria”

2013 “Study of local Ca^{2+} sparks using genetically-encoded Ca^{2+} probes”

LABORATORY METHOD EXPERIENCES

1. Isolation and primary cell culture (ventricular myocytes, neonatal cardiac myocytes)
2. iPSC culture and differentiation to cardiomyocytes
3. Patch clamp technique
4. Multielectrode array
5. Ca^{2+} imaging
6. TIRF
7. Western Blot
8. Immunocytochemistry
9. Histology

TEACHING EXPERIENCES

2007 Personal Teaching:

- 1-Animal Physiology
- 2-Embriology (organogenesis of the vertebrates)
- 3-Comparative Anatomy of the Vertebrates
- 4-Medical Physiology

WORKSHOPS

2009 Scientific Writing, Graduate Research Program 1326, Homburg (Saar)

2010 Scientific Presentation, GradUS, Saarbrueken

2011 Communicating at Conferences, Graduate Research Program 1326, Homburg

PROFESSIONAL AFFILIATIONS

2005-present Member of Iranian Society of Physiology and Pharmocology 2009-present Associate Member of Graduate Research Program 1326, Calcium Signaling and Cellular Nanodomains, Medical Faculty, Saarland University, Homburg (Saar), Germany

2011-present Member of Biophysical Society, Maryland, USA

COMPUTER SKILLS

Operating System: Windows and Mac

Microsoft Office: Word, Excel, Powerpoint, Publisher Adobe: Photoshop, Illustrator

Statistical Softwares: SPSS, Prism Grafics softwares: Origin, Signal, IgorPro Patchmaster, Fitmaster, pCLAMP

REFEREES

Prof. Dr. Martin Morad moradm@musc.edu

Dr. Lars Cleemann cleemann@musc.edu

Prof. Dr. Peter Lipp peter.lipp@uks.de

Prof. Hossein Baharvand baharvand@royaninstitute.org