



Name, surname, titles: Ing. Alexandra Zahradníková, DrSc., academician of the Learned Society Slovakia  
e-mail: [alexandra.zahradnikova@savba.sk](mailto:alexandra.zahradnikova@savba.sk)  
Researcher ID/ORCID: **ORCID:** 0000-0002-7296-9617  
**ResearcherID:** B-1826-2009  
h-index: 20  
Total citations: 1053 (without self-citations)

#### **Current affiliation**

- 2018 - Department of Cellular Cardiology, Institute of Experimental Endocrinology, Biomedical Research Center, Slovak Academy of Sciences, Bratislava, Slovakia

#### **Professional experience**

- 2005 Visiting Scientist, Dept. Physiol. Cell Biol., Ohio State University, Columbus, OH, USA
- 1995 - 2004 Visiting Scientist, Department of Physiology, TTU HSC, Lubbock, TX, USA
- 1994 - 1996 Visiting Scientist, Department of Physiology and Endocrinology, MCG, Augusta, GA, USA
- 1990 - 2018 Institute of Molecular Physiology and Genetics/Centre of Biosciences, SAS, Bratislava, Slovakia
- 1989 - 1991 Postdoctoral Fellow, Department of Physiology and Biophysics, UTMB, Galveston, TX, USA
- 1982 - 1990 Centre of Physiological Sciences, Slovak Academy of Sciences, Bratislava, Czechoslovakia

#### **Education and academic qualifications**

- 1976 Ing, Faculty of Chemical Engineering, Slovak Technical University, Bratislava, Slovakia
- 1982 PhD, Faculty of Chemical Engineering, Slovak Technical University, Bratislava, Slovakia
- 2010 DrSc (Doctor of Science, Animal Physiology), Slovak Academy of Sciences

#### **Training, professional licenses, certifications**

- 2008 Certificate, Project Management, School of Management Trenčín & SAS
- 2007-2008 Certificate, Management of Human Resources, School of Management Trenčín & SAS
- 2007 Certificate, Strategic & Change Management, School of Management Trenčín & SAS
- 2016 Certificate, Leica TCS SP8 STED 3X operation and safety, Pragolab, Czech Republic

#### **Membership in professional societies**

- Slovak Biophysical Society
- Slovak Physiological Society of the Slovak Medical Society
- European Society of Cardiology (Working Group for the Cardiac Cellular Electrophysiology)

#### **Teaching and/or supervising activities**

- 11 successfully graduated PhD students
- Teaching subjects Molecular Biophysics II, Cell Biophysics II, Molecular Biophysics of Cells, Special Methods of Biophysics I, and Special Methods of Biophysics II in the Graduate Biophysics program at the Faculty of Science, Pavol Jozef Safarik University in Kosice for PhD students located in Bratislava

#### **Other relevant information – prestigious awards and distinctions, invited lectures, activities, etc.**

##### *Awards*

- 2024 Award of the Slovak Biophysical Society
- 2024 Medal of the Establishment of the Medico-Slavic Society, bestowed by the Presidium of the Slovak Medical Society
- 2019 Silver Medal of the Slovak Medical Society – Propter Merita
- 2017 Academician of the Learned Society Slovakia
- 2015 Prize of the Slovak Academy of Sciences for research results
- 2014 Dionýz Ilkovič Honorary Plaque of the Slovak Academy of Sciences for merit in physicochemical sciences
- 2004 Bronze Medal of the Slovak Medical Society – Propter Merita
- 2001 Howard Hughes Medical Institute International Research Scholar Award
- 1996 Fulbright Scholar Award
- 1995 Howard Hughes Medical Institute International Research Scholar Award

##### *Member of Editorial Board:*

Journal of General Physiology; European Journal of Biophysics; Frontiers in Physiology

*Invited lectures (selected out of 20 at conferences and 19 at universities)*

- 2024 Emerging ryanodine receptor function under the light of its molecular structure. *Regional Biophysics Conference*, August 26-30, 2024, Split, Croatia
- 2022 Mechanisms of ryanodine receptor modulation by calcium and magnesium ions, *49<sup>th</sup> European Muscle Conference*, 22.-26.9.2022, Prague, Czech Republic
- 2018 Allosteric Aspects of Ryanodine Receptor Gating. *Biophysical Society (USA) Thematic Meeting The Heart by Numbers: Integrating Theory, Computation, and Experiment to Advance Cardiology*. Berlin, Germany | September 4–7, 2018
- 2016 Calcium wave generation in cardiac myocytes, *Regional Biophysics Conference*, 25-28.8.2016, Trieste, Italy
- 2014 Sparks and waves in cardiac myocytes - insights from an allosteric model of ryanodine receptor gating. *13th International Meeting of the European Calcium Society*, 13.-17. 9. 2014, Aix-en-Provence, France
- 2009 Spontaneous action potentials in ventricular myocytes. *Third European Science Foundation Conference on Functional Dynamics*, March 2 - 5, 2009, Cascais, Portugal
- 2004 Regulation of Calcium Release Activation at the Level of Calcium Trigger Signals. *MBI Workshop Signal Transduction II: Muscles and Synapse*. Columbus, OH, USA, March 8-12, 2004

### Selected scientific results

The most important research achievements of Alexandra Zahradníková are the identification of four Ca<sup>2+</sup> binding activation sites of the ryanodine receptor, elucidation of the molecular mechanisms of ryanodine receptor activation by ligands using electrophysiological approaches, modeling of RyR function, structural analysis and modeling of RyR structures, and identification of quantitative relationships between ryanodine receptor gating, local calcium release from dyads, and formation of cellular calcium signals.

*Most significant publications*

1. **Zahradníková A\***, Pavelkova J, Sabo M, Baday S, Zahradník I\* (2025). Structure-based mechanism of RyR channel operation by calcium and magnesium ions. *PLoS Comput Biol* 21: e1012950. Citations: 3. Q1 (JCR), Percentile 92.96 (SJR).
2. Novotova M, Zahradnikova A Jr, Nichtova Z, Kovac R, Kralova E, Stankovicova T, **Zahradnikova A**, Zahradnik I\*: Structural variability of dyads relates to calcium release in rat ventricular myocytes. *Sci Rep* 10: 8076, 2020. Citations: 11, Q1 (JCR), Percentile 95.05 (SJR)
3. Poláková E, Zahradníková A Jr, Pavelková J, Zahradník I, **Zahradníková A\***. Local calcium release activation by DHPR calcium channel openings in rat cardiac myocytes, *J Physiol* 586: 3839-3854, 2008. Citations: 37. Q1, Percentile 92.95 (JCR); 91.21 (SJR)
4. Zahradník I, Györke S, **Zahradníková, A\***. Calcium activation of ryanodine receptor channels - Reconciling RyR gating models with tetrameric channel structure, *J Gen Physiol* 126:515-527, 2005. Citations: 36, Q1, Percentile 93.92 (JCR); 95.91 (SJR)
5. **Zahradnikova A\***, Zahradnik, I. A minimal gating model for the cardiac calcium release channel, *Biophys J* 71:2996-3012, 1996. Citations: 49, Q1 (1997), Percentile 90.22 (JCR 1997); 94.38 (SJR 1999)

\*corresponding author

*Most significant grants*

1. JRP/2019/836/RyRinHeart: Discovery of Ryanodine Receptor Inhibitors for Heart Diseases (2020 – 2022), PI: **Alexandra Zahradníková**; FTE allocated by the team: 12 for the whole period; Total budget: EUR 120 000 €; project budget: 75 000 €; co-financing by BMC SAS: 45 000 €);
2. APVV-15-0302 CAMYS: Cytoarchitecture of calcium signaling of cardiac myocytes in development of myocardial hypertrophy (2016 – 2019); PI: **Alexandra Zahradníková**; FTE allocated by the team for the whole period: 12.03; Total budget: 250 000 €
3. APVV-0721-10 REMOD: Myocardial remodeling – the role of calcium signaling (2011 – 2014); PI: **Alexandra Zahradníková**; FTE allocated by the team for the whole period: 16.63; Total budget: 250 000 €
4. LSHM-CT-2005-018802 CONTICA (6th FP): Control of Intracellular Calcium in Arrhythmias, (2006 - 2009) PI: Burkert Pieske, University of Göttingen, Germany/Medical University Graz, Austria; Team leader of the Slovak team: **Alexandra Zahradníková**; FTE allocated by the team for the whole period: 14.8; Total budget: 2 755 000 €; for the Slovak team: 255 340 €
5. HHMI-55000343: Molecular mechanisms of calcium signaling in cardiac excitation-contraction coupling (2001-2005); PI: **Alexandra Zahradníková**; FTE allocated by the team for the whole period: 25; Total budget: 375 000 \$