

Curriculum Vitae

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ResearcherID: B-1826-2009

EDUCATION:

- 1976 M.S., Inorganic Chemistry, Faculty of Chemical Technology, STU, Bratislava
Thesis: A spectrophotometric study of chlorocopper(II) complexes in acetic anhydride.
- 1982 Ph.D., Inorganic Chemistry, Faculty of Chemical Technology, STU, Bratislava
Thesis: A spectrophotometric study of the effect of organic solvents on the properties of chlorocopper(II) complexes.

EMPLOYMENT:

- 2018 - Chief Research Fellow, Institute of Experimental Endocrinology, Biomedical Research Center, Slovak Academy of Sciences, Bratislava, Slovak Republic
Regulation of cellular calcium homeostasis, L-type calcium channels and SR calcium release channels - patch clamp, confocal microscopy, planar lipid bilayers, mathematical modeling
- 2010 - 2018 Chief Research Fellow, Institute of Molecular Physiology and Genetics, Centre of Biosciences, Slovak Academy of Sciences, Bratislava, Slovak Republic
- 2010 - 2016 Chief Research Fellow, Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences, Bratislava, Slovak Republic
- 1994 - 2010 Principal Research Fellow, Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences, Bratislava, Slovak Republic
Regulation of cellular calcium homeostasis, L-type calcium channels and SR calcium release channels - patch clamp, confocal microscopy, planar lipid bilayers, mathematical modeling
- 2005 Visiting Scientist, Department of Physiology and Cell Biology, Ohio State University, Columbus, OH, USA
- 1995 - 2004 Visiting Scientist, Department of Physiology, TTUHSC, Lubbock, TX, USA (4 – 8 weeks per year)
Activation of the cardiac ryanodine receptor by physiological calcium stimuli – planar lipid bilayers, flash photolysis
- 1996 Fulbright Scholar, Texas Tech University Health Science Center, Lubbock, TX & Department of Physiology and Endocrinology, Medical College of Georgia, Augusta, GA, USA
Conformational transitions in the cardiac ryanodine receptor - planar lipid bilayers
- 1993-96 Visiting scientist, Department of Physiology and Endocrinology, Medical College of Georgia, Augusta, GA, USA (4 – 12 weeks per year)
Modulation of Ca release channels in heart - planar lipid bilayers
Regulation of skeletal muscle Ca release - planar lipid bilayers

- 1993 Principal Research Fellow, Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences, Bratislava, Slovak Republic
Calcium currents in mammalian heart muscle cells - patch clamp, Ca release channels in heart SR, planar lipid bilayers, mathematical modeling
- 1991 - 1993 Senior Research Fellow, Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences, Bratislava, Czechoslovakia
Calcium currents in mammalian heart muscle cells - patch clamp
- 1989 - 1991 Postdoctoral Fellow, Department of Physiology and Biophysics, University of Texas Medical Branch, Galveston, TX, USA
Ionic channels of skeletal muscle sarcoballs - patch clamp; Pharmacology of E-C coupling in heart muscle - planar lipid bilayers, mathematical modeling
- 1985 - 1989 Senior Research Fellow, Center of Physiological Sciences, Slovak Academy of Sciences, Bratislava, Czechoslovakia
Ionic channels of mammalian cells at the whole-cell and single channel level - patch clamp
- 1983 - 1985 Research Fellow, Centre of Physiological Sciences, Slovak Academy of Sciences, Bratislava, Czechoslovakia
Study of ionic channels at the single channel level - patch clamp.
- 1982 - 1983 Senior Research Assistant, Center of Physiological Sciences, Slovak Academy of Sciences, Bratislava, Czechoslovakia
Development of a fast glucose oxidase electrode for use in euglycemic hyperinsulinemic clamp - voltammetry
- 1982 Lecturer, Slovak Technical University, Faculty of Chemical Technology, Department of Inorganic Chemistry, Bratislava, Czechoslovakia

GRANT SUPPORT:

CURRENT: JRP SAS-TÜBITAK

PAST: Grants Agency for Science of the Slovak Republic (VEGA);
Slovak Research and Development Agency (APVV)
NIH Fogarty International Research Collaboration Award (with Sándor Györke)
6th Framework program – projects CONTICA (LSHM-CT-2005-018802) and EUGeneHeart (LSHM-CT-2005-018833)
Howard Hughes Medical Institute International Research Scholar Award (1995, 2000)

TEACHING:

Calcium signaling in cardiac myocytes – lectures for students of physical chemistry and biochemistry (Faculty of Natural Sciences, Comenius University Bratislava) and biophysics (Pharmaceutical Faculty, Comenius University Bratislava)

Ryanodine receptors – lectures for students of physical chemistry and biochemistry (Faculty of Natural Sciences, Comenius University Bratislava) and biophysics (Pharmaceutical Faculty, Comenius University Bratislava)

Molecular biophysics (graduate students of Biophysics, Faculty of Natural Sciences, Pavol Jozef Šafárik University Košice)

TRAINEES:

D. Jančinová (M.S., biophysics)
G. Zapletal (M.S., radioelectronics)
I. Minarovič (M.S., pharmacology; PhD., biophysics)
M. Dura (M.S., biophysics; PhD., biophysics)
Z. Kubalová (PhD., biophysics)
E. Poláková (PhD., biophysics)
B. Tencerová, PhD. (biophysics)

M. Karhánek (PhD., biophysics)
R. Janíček (PhD., animal physiology)
A. Faltinová (PhD., biophysics)
K. Macková (PhD., biophysics)

MEMBERSHIP IN ELECTED SCIENTIFIC SOCIETIES:

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

HONORS AND AWARDS:

2019 - Silver Medal of the Slovak Medical Society
2017- Academician of Learned Society Slovakia
2015 - Award of the Slovak Academy of Sciences for research
2014 - Dionýz Ilkovič Honorary Plaque of the Slovak Academy of Sciences for merit in physico-chemical sciences
2010 - Doctor of Science, Slovak Academy of Sciences
2005 - Award of the Slovak Physiological Society for the 2004 Best Publication in Physiology (**Zahradníková A**, Kubalová Z, Pavelková J, Györke S, Zahradník I, Am J Physiol Cell Physiol 286: C330–C341, 2004)
2004 - Bronze Medal of the Slovak Medical Society
2000 - Howard Hughes Medical Institute International Research Scholar
1999 - Award of the Slovak Physiological Society for the 1998 Best Publication in Physiology (**Zahradníková A**, Mészáros LG, J Physiol 509: 29-38, 1998)
1996 - Fulbright Scholar
1995 - Howard Hughes Medical Institute International Research Scholar
1994 - Award of the Slovak Physiological Society for the 1993 Best Publication in Physiology (**Zahradníková A**, Palade P, Biophys J 64: 991-1003, 1993)

EDITOR/EDITORIAL BOARD MEMBER FOR: Journal of General Physiology, Frontiers in Physiology, European Biophysics Journal, Open Life Sciences

ADMINISTRATIVE WORK:

2015 - 2018 chair, Scientific Board, Institute of Molecular Physiology and Genetics SAS
2015 - 2018 chair, Graduate Committee for Biophysics, Institute of Molecular Physiology and Genetics/Centre of Biosciences, Slovak Academy of Sciences
2013 - member, Committee for doctoral degrees, Biophysics
2013 - member, Graduate Committee for Biotechnology, Faculty of Chemistry and Food Technology, Slovak Technical University
2010 - member, Advisory Board of the Slovak Academy of Sciences for Chemical Sciences
1998 - member, Graduate Committee for Biophysics, Faculty of Mathematics and Physics, Comenius University
1998 - 2016 member, Graduate Committee for Biophysics, Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences
1998 - 2005 member, Committee for Shared Computing Facilities of the Slovak Academy of Sciences
1994 - 2010 member, Executive Board, Institute of Molecular Physiology and Genetics
1994 - 1997 Scientific Secretary, Institute of Molecular Physiology and Genetics
1992 - 2008 member, Scientific Board, Institute of Molecular Physiology and Genetics
1985 - 1986 Scientific Secretary, Research Division, Center of Physiological Sciences

1985 - 1986 member, Executive Board, Research Division, Center of Physiological Sciences

TECHNICAL FAMILIARITY IN:

Biophysics of ion channels – channel gating and permeation

Patch clamp – single channel and whole cell

Confocal microscopy – calcium imaging, immunofluorescence, STED microscopy

Computer simulation and modeling

Data acquisition and analysis

Programming (C++, php, Mathematica, MATLAB)

Cell isolation and fractionation

Planar lipid bilayers – channel reconstitution

Flash photolysis

SELECTED PUBLICATIONS

1. Cagalinec M, Zahradnikova A, Zahradnikova A Jr, Kovacova D, Paulis L, Kurekova S, Hotka M, Pavelkova J, Plaas M, Novotova M, Zahradnik I (2019). Calcium signaling and contractility in cardiac myocyte of wolframin deficient rats. *Front Physiol* 10: 172,
2. Mackova K, Zahradnikova A Jr, Hotka M, Hoffmannova B, Zahradnik I, Zahradnikova A (2017). Calcium release-dependent inactivation precedes formation of the tubular system in developing rat cardiac myocytes. *Eur Biophys J* 46: 691-703.
3. Petrovic P, Valent I, Cocherova E, Pavelkova J, Zahradnikova A (2015): Ryanodine receptor gating controls generation of diastolic calcium waves in cardiac myocytes. *J Gen Physiol* 145: 489-511.
4. Borko L, Bauerova-Hlinkova V, Hostinova E, Gasparik J, Beck K, Lai FA, Zahradnikova A, Sevcik J (2014): Structural insights into the human RyR2 N-terminal region involved in cardiac arrhythmias. *Acta Cryst D* 70: 2897–2912.
5. Janicek R, Zahradnikova-Jr A, Polakova E, Pavelkova J, Zahradnik I, Zahradnikova A (2012): Calcium spike variability in cardiac myocytes results from activation of small cohorts of RYR2 channels. *J Physiol* 590: 5091-5106.
6. Tencerova B, Zahradnikova A, Gaburjakova J, Gaburjakova M (2012): Luminal Ca²⁺ controls activation of the cardiac ryanodine receptor by ATP. *J Gen Physiol* 140: 93-108.
7. Zahradnikova A, Valent I, Zahradnik I (2010): Frequency and release flux of calcium sparks in rat cardiac myocytes: a relation to RYR gating. *J Gen Physiol* 136: 101-116.
8. Polakova E, Zahradnikova A Jr, Pavelkova J, Zahradnik I, Zahradnikova A (2008). Local calcium release activation by DHPR calcium channel openings in rat cardiac myocytes. *J Physiol*. 586: 3839-3854.
9. Zahradnikova A Jr, Polakova E, Zahradnik I, Zahradnikova A (2007). Kinetics of calcium spikes in rat cardiac myocytes. *J Physiol* 578: 677-691.
10. Zahradnik I, Gyorke S, Zahradnikova A (2005). Calcium activation of ryanodine receptor channels—reconciling RyR gating models with tetrameric channel structure. *J Gen Physiol*. 126: 515-527.