

Curriculum vitae

Family name: **Szabo**

First name: **Ildiko**

Researcher unique identifiers: **Orcid 0000-0002-3637-3947, Scopus: 35595280300**

Date of birth: **05/09/1965**

Nationality: **italian/hungarian**

Family status: Married, 1 child

EDUCATION

1994 PhD in Molecular and Cellular Biology and Pathology
 Faculty of Medicine/Dept of Biomedical Sciences/ Univ of Padova/ Italy

1988 M.Sc. in Biology and Chemistry
 Faculty of Sciences/Univ Eotvos Lorand/ Hungary

CURRENT POSITION

2017- Full Professor in Biochemistry/ Dept of Biology/Univ of Padova/ Italy

PREVIOUS POSITIONS

2005 – 2016 Associate Professor in Biochemistry, Univ of Padova/ Italy

1998 – 2004 Assistant Professor, Univ of Padova/ Italy

AWARDS AND FELLOWSHIPS

2015 Human Frontiers Science Program Award (coordinator of HFSP grant)

2014 Habilitation for Full Professorship in Biochemistry and in Plant Physiology

2002 EMBO Young Investigator Program Award

2000 National Research Council Young Investigator Grant

1995 – 1997 EMBO Long Term postdoctoral fellow
 Institute of Physiology /Univ of Tuebingen/ Germany

• SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

1998- Postdocs: 22/ PhD: 13/ Master Students: 65

• TEACHING ACTIVITIES

2005- 120 hours of frontal lessons/year, Univ of Padova

1998 – 2004 60 hours of frontal lessons + 30 hours laboratory practice/year, Univ of Padova

• ORGANISATION OF SCIENTIFIC MEETINGS (selected)

2021 Organizing Scientific Committee Member of MAC2021 (Mitochondria, Apoptosis and Cancer, Singapore (online))

2017 Chair of the 2nd GRC on “Organellar Channels and Transporters, Mount Snow, VT/USA

2016 Co-Chair of the International Biophysics School on Photosynthesis, Venice/Italy

2015 Vice-Chair of the 1st Gordon Research Conference (GRC) on “Organellar Channels and Transporters, Bentley, Waltham /USA

2005 Co-Organizer of the Ph.D. school course for YIP lab members, EMBL, Heidelberg/Germany

• INSTITUTIONAL RESPONSIBILITIES (selected)

From 2022 Elected Co-Chair of the Mitochondria&Bioenergetics Subgroup of the American Biophysical Society

From 2017 Scientific Board Member of AIRC (Italian association for cancer research)

From 2017 Director of the Ph.D. School in Biosciences (80 Ph.D. students)

2009-2011 Vice-director of the Ph.D. School in Biosciences and Biotechnologies

• REVIEWING ACTIVITIES (selected)

From 2017 Evaluator of ERA-Chairs and ERC Starting/Consolidator Grants

From 2017 Editorial Board Member of Frontiers in Physiology, Cell Stress

From 2014 Evaluator for projects of the DFG, ANR, FNRS
From 2004 Evaluator of Marie-Curie postdoctoral fellowships
From 2000 Ad hoc reviewer for Nature, Plant Cell, Molecular Plant, New Phytologist, Plant Physiology, Cell Metabolism, Nature Communications, Cell, EMBO J, PNAS (and many other journals)

• **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

Italian Societies of Biochemistry, of Bioenergetics and Biomembranes and of Pure and Applied Biophysics
American Biophysical and Physiological Societies

EMBO YIP

COLLABORATIONS (selected)

National: Univ of Padova: *Mario Zoratti, Rosario Rizzuto, Paolo Bernardi*; (mammalian mitochondrial ion channels); *Lorella Navazio, Elide Formentin* (chloroplast calcium&channels); *Livio Trentin, Antonio Rosato* (cancer); *Massimo Zeviani, Carlo Viscomi* (mitochondrial diseases); Univ of Milan: *Alex Costa* (Topic: organelle-targeted genetically encoded Ca²⁺probes).

International: *Erich Gulbins* (Essen, Kv1.3 and cancer); *Antonio Felipe* (Barcelona, targeting of ion channels); *Ahmed Syed* (Cincinnati, pancreatic cancer); *Giovanni Finazzi* (Grenoble, regulation of photosynthesis); *Toshiharu Shikanai* (Kyoto, regulation of photosynthesis); *Markus Schwarzlander* (Munster, plant mitochondrial ion channels); *Ute Vothknecht* (Bonn, chloroplast calcium signaling); *Jukka Kallijärvi* (Helsinki, mitochondrial diseases); *Anumantha Kanthasamy* (Georgia Univ, USA, Parkinson).

CAREER BREAKS

2000 Maternity leave, 5 months

2007 Severe illness, 9 months

RESEARCH INTEREST AND MAIN ACHIEVEMENTS: The PI established her independent group in 2002 thanks to EMBO YIP. She focuses on the study of *ion channels in bioenergetic organelles* in plants and animals through combination of molecular and cell biology with biophysics and bioenergetic studies in a cross-disciplinary way. She is one of the pillars of a strong scientific community working on bioenergetic organelles in Padova as she crucially contributed to the discovery of several mitochondrial ion channels (MCU, KATP, PTP, Kv1.3). In addition, she works on pharmacological targeting of mitochondrial ion channels in the context of cancer, autoimmune diseases and on mitochondrial diseases. Her pioneering works in the field of plant sciences identified channel-mediated regulation of photosynthetic efficiency and of stress response in plants. Her research has been carried out thanks to prestigious international (*HFSP, EMBO, WWCR (Worldwide Cancer Research), MJFF (Michael J. Fox Foundation)*) and national grants (*AIRC, Italian Ministry, Telethon, AISM (Multiple Sclerosis Association)*).

I.S. published 190 papers in international peer reviewed journals, H-index = 59 Citations = 14910
(Scopus).

Orcid 0000-0002-3637-3947, Scopus: 35595280300

Recent rating in **Ion Channels by Expertscape:** Named 26th best expert in Europe out of more than 75 800 scientists and 49th best scientist Worldwide out of 231 500 scientists.

15 SELECTED PUBLICATIONS IN LAST 10 YEARS, AS LAST/(CO)CORRESPONDING AUTHOR

1) Severin F, Urbani A, Varanita T, Bachmann M, Azzolini M, Martini V, Pizzi M, Tos APD, Frezzato F, Mattarei A, Ghia P, Bertilaccio MTS, Gulbins E, Paradisi C, Zoratti M, Semenzato GC, Leanza L, Trentin L, Szabò I.

Pharmacological modulation of Kv1.3 potassium channel selectively triggers pathological B lymphocyte apoptosis in vivo in a genetic CLL model.

J Experimental and Clinical Cancer Research 2022 Feb 16;41(1):64.

2) Checchetto V, Leanza L, De Stefani D, Rizzuto R, Gulbins E, Szabo I.

Mitochondrial K⁺ channels and their implications for disease mechanisms.

Pharmacology & Therapeutics 2021 Nov;227:107874.

- 3) Peruzzo R, Corrà S, Costa R, Brischigliaro M, Varanita T, Biasutto L, Rampazzo C, Ghezzi D, Leanza L, Zoratti M, Zeviani M, De Pittà C, Viscomi C, Costa R, **Szabò I**.
Exploiting pyocyanin to treat mitochondrial disease due to respiratory complex III dysfunction.
Nature Communications 2021 Apr 8;12(1):2103.
- 4) Bachmann M, Rossa A, Antoniazzi G, Biasutto L, Carrer A, Campagnaro M, Leanza L, Gonczi M, Csernoch L, Paradisi C, Mattarei A, Zoratti M, **Szabo I**.
Synthesis and cellular effects of a mitochondria-targeted inhibitor of the two-pore potassium channel TASK-3.
Pharmacological Research 2021 Feb;164:105326.
- 5) Peruzzo R, Mattarei A, Azzolini M, Becker-Flegler KA, Romio M, Rigoni G, Carrer A, Biasutto L, Parrasia S, Kadow S, Managò A, Urbani A, Rossa A, Semenzato G, Soriano ME, Trentin L, Ahmad S, Edwards M, Gulbins E, Paradisi C, Zoratti M, Leanza L, **Szabò I**.
Insight into the mechanism of cytotoxicity of membrane-permeant psoralenic Kv1.3 channel inhibitors by chemical dissection of a novel member of the family.
Redox Biology 2020 Oct;37:101705.
- 6) Urbani A, Giorgio V, Carrer A, Franchin C, Arrigoni G, Jiko C, Abe K, Maeda S, Shinzawa-Itoh K, Bogers JFM, McMillan DGG, Gerle C, **Szabò I**, Bernardi P.
Purified F-ATP synthase forms a Ca²⁺-dependent high-conductance channel matching the mitochondrial permeability transition pore.
Nature Communications 2019 Sep 25;10(1):4341.
- 7) Costa R, Peruzzo R, Bachmann M, Montà GD, Vicario M, Santinon G, Mattarei A, Moro E, Quintana-Cabrera R, Scorrano L, Zeviani M, Vallese F, Zoratti M, Paradisi C, Argenton F, Brini M, Cali T, Dupont S, **Szabò I**, Leanza L.
Impaired Mitochondrial ATP Production Downregulates Wnt Signaling via ER Stress Induction.
Cell Reports 2019 Aug 20;28(8):1949-1960.e6
- 8) Teardo E, Carraretto L, Moscatiello R, Cortese E, Vicario M, Festa M, Maso L, De Bortoli S, Cali T, Vothknecht UC, Formentin E, Cendron L, Navazio L, **Szabo I**.
A chloroplast-localized mitochondrial calcium uniporter transduces osmotic stress in Arabidopsis.
Nature Plants 2019 Jun;5(6):581-588.
- 9) Leanza L, Romio M, Becker KA, Azzolini M, Trentin L, Managò A, Venturini E, Zaccagnino A, Mattarei A, Carraretto L, Urbani A, Kadow S, Biasutto L, Martini V, Severin F, Peruzzo R, Trimarco V, Egberts JH, Hauser C, Visentin A, Semenzato G, Kalthoff H, Zoratti M, Gulbins E, Paradisi C, **Szabo I**.
Direct Pharmacological Targeting of a Mitochondrial Ion Channel Selectively Kills Tumor Cells In Vivo.
Cancer Cell 2017 Apr 10;31(4):516-531.e10.
- 10) Teardo E, Carraretto L, Wagner S, Formentin E, Behera S, De Bortoli S, Larosa V, Fuchs P, Lo Schiavo F, Raffaello A, Rizzuto R, Costa A, Schwarzländer M, **Szabò I**.
Physiological Characterization of a Plant Mitochondrial Calcium Uniporter in Vitro and in Vivo.
Plant Physiology 2017 Feb;173(2):1355-1370.
- 11) Carraretto L, Teardo E, Checchetto V, Finazzi G, Uozumi N, **Szabo I**.
Ion Channels in Plant Bioenergetic Organelles, Chloroplasts and Mitochondria: From Molecular Identification to Function.
Molecular Plant. 2016 Mar 7;9(3):371-395.
- 12) Managò A, Leanza L, Carraretto L, Sassi N, Grancara S, Quintana-Cabrera R, Trimarco V, Toninello A, Scorrano L, Trentin L, Semenzato G, Gulbins E, Zoratti M, **Szabò I**.
Early effects of the antineoplastic agent salinomycin on mitochondrial function.
Cell Death & Disease 2015 Oct 22;6(10):e1930.
- 13) Teardo E, Carraretto L, De Bortoli S, Costa A, Behera S, Wagner R, Lo Schiavo F, Formentin E, **Szabo I**.
Alternative splicing-mediated targeting of the Arabidopsis GLUTAMATE RECEPTOR3.5 to mitochondria affects organelle morphology.
Plant Physiology 2015 Jan;167(1):216-27.
- 14) Carraretto L, Formentin E, Teardo E, Checchetto V, Tomizioli M, Morosinotto T, Giacometti GM, Finazzi G, **Szabó I**.
A thylakoid-located two-pore K⁺ channel controls photosynthetic light utilization in plants.
Science. 2013 Oct 4;342(6154):114-8.
- 15) Checchetto V, Segalla A, Allorent G, La Rocca N, Leanza L, Giacometti GM, Uozumi N, Finazzi G, Bergantino E, **Szabò I**.

Thylakoid potassium channel is required for efficient photosynthesis in cyanobacteria.
Proc Natl Acad Sci U S A. **2012** Jul 3;109(27):11043-8.

Other selected publications:

- 1) De Stefani D, Raffaello A, Teardo E, **Szabo I**, Rizzuto R. *Nature.* **2011**, 476:336.
- 2) **Szabo I** and Zoratti M, *Physiological Reviews*, **2014**, 94:519-608
- 3) Paggio A, Checchetto V, Campo A, Menabò R, Di Marco G, Di Lisa F, **Szabo I**, Rizzuto R, De Stefani D.
Nature. **2019** 572:609

Patents: 1) PD2015A000006 2) No 102021000006065

Projects as coordinator/PI:

- 1) WWCR (2021), international coordinator. Partner: Prof. E. Gulbins, Germany
- 2) Human Frontiers Science Program (2015-2019) international coordinator Partners: Giovanni Finazzi (Grenoble, France); Toshiharu Shikanai (Kyoto, Japan); Chris Chang (Berkeley, USA)
- 3) PRIN (Italian Ministry) 2015-2019 national coordinator. Partners: V de Pinto (Catania); A Moroni (Milan); M Ceccarelli (Cagliari); A. Carpaneto (CNR Genova)
- 4) Michael J. Fox (2022)- coordinator, partners: A. Kanthasamy (Athens USA), A. Pike (Neuropore USA)
- 5) Grants from AIRC (since 2007), Telethon, AISM as single PI.

Invited speaker at 41 conferences in last 10 years. Keynote speaker at FEBS Workshop on Plant organellar signalling, Primosten, Croatia, 2015