



## Bogdan Amuzescu

### Position

Associate Professor

### Affiliation

Dept Biophysics&Physiology, Faculty of Biology,  
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### Education

- 1972-1976, Elementary school no. 80 in Bucharest
- 1976-1980, Secondary school (gymnasium) no. 117 in Bucharest
- 1980-1984, "Nicolae Balcescu" college in Bucharest (former and present St. Sava National College), mathematics physics class; Diploma
- 1985-1991, Faculty of Medicine of the "Carol Davila" University of Medicine and Pharmacy in Bucharest; Diploma
- 1999-2000, Master in neurobiology, University of Bucharest
- 2000-2003, PhD, Faculty of Biology, University of Bucharest; thesis title: "Properties of ion channels in biomembranes" Supervisor: Prof. Maria-Luisa Flonta, Co-promotors: Prof. Willy van Driessche, Prof. Gordon Reid
- 2000-2003, Research fellowship, Dept Mol. Cell Biol, Faculty of Medicine, KU Leuven (Prof. Willy van Driessche)
- 2003-2004, Postdoctoral research fellowship, Cardiac Electrophysiology Group, Center for Experimental Surgery & Anaesthesiology, KU Leuven (Prof. K. Mubagwa)

### Experience

- 1991-1992, Stagiary physician in Constanta Departmental Hospital, Laboratory of Nuclear Medicine and Ist Medical Clinic
- 1991-1992, Associated assistant in the Department of Biophysics, Biotechnology, Medical Informatics and Biostatistics, Faculty of Medicine, "Ovidius" University, Constanta
- 1992-1994, Secondary physician (specialization in clinical hematology) in Fundeni Hospital, Clinic of Hematology
- 1994-1995, Secondary physician (specialization in internal medicine) in Bucharest University Hospital, IInd Medical Clinic
- 1995-2000, Specialist physician (internal medicine) in Bolintin Hospital
- 2000-2002, Assistant Lecturer, Dept. Biophysics & Physiology, Univ. of Bucharest
- 2002-2005, Lecturer, Dept. Biophysics & Physiology, Univ. of Bucharest
- 2005-present, Associate Professor, Dept. Biophysics & Physiology, Univ. of Bucharest

### Specialities

- Mathematical modeling & analysis of complex biological systems (heart, neuronal networks)
- Membrane biophysics and transport phenomena in biomembranes
- Thermodynamics of biological systems
- Molecular electrophysiology & pharmacology - the patch-clamp technique
- Thermotransduction, nociception and pain
- Molecular pathophysiology and experimental models of various diseases:

inflammatory and neuropathic pain, diabetic neuropathy, neuronal and myocardial ischemia, Alzheimer's disease

## Publication list

### Refereed Papers

- [01] Reid G., Amuzescu B., Zech E., Flonta M.-L. (2001): A system for applying rapid warming or cooling stimuli to cells during patch clamp recording or ion imaging. *J Neurosci Methods* 111(1):1-8.
- [02] Babes A., Amuzescu B., Krause U., Scholz A., Flonta M.-L., Reid G. (2002): Cooling inhibits capsaicin-induced currents in cultured rat dorsal root ganglion neurones. *Neurosci Lett.* 317(3):131-134.
- [03] Amuzescu B., Ion S., Popescu D., Movileanu L., Avram S., Macri B., Flonta M.-L. (2002): Thermal group motion creates stochastic pores in plane phosphatidylcholine bilayers. *Romanian J Biophys.* 12 (1-2): 37-52.
- [04] Pena F., Neaga E., Amuzescu B., Nitu A., Flonta M-L (2002): Amitriptyline has a dual effect on the conductive properties of the epithelial Na channel. *J Pharm Pharmacol.* 54:1393-1398.
- [05] Amuzescu B., Segal A., Flonta M-L., Simaels J., Van Driessche, W. (2003): Zinc is a voltage-dependent blocker of native and heterologously expressed epithelial Na<sup>+</sup> channels. *Pflügers Arch.* 446: 69-77.
- [06] Gwanyanya A., Amuzescu B., Zakharov S., Macianskiene R., Sipido K., Bolotina V., Verecke J., Mubagwa K. (2004): Magnesium-inhibited, TRPM6/7-like channels in cardiac myocytes: permeation of divalent cations and pH-mediated regulation. *J Physiol.* 559(3): 761-776.
- [07] Neaga E., Amuzescu B., Dinu C., Macri B., Pena F., Flonta M.-L. (2005): Extracellular trypsin increases ASIC1a selectivity for monovalent versus divalent cations. *J Neurosci Methods* 144: 241-248.
- [08] Pena F., Amuzescu B., Neaga E., Flonta M.-L. (2006): Thermodynamic properties of hyperpolarization-activated current (I<sub>h</sub>) in a subgroup of primary sensory neurons, *Exp Brain Res.*, 173(2):282-290.
- [09] Marin A., Prica C., Amuzescu B., Neaga E., Flonta M.-L. (2008): ASIC1a activation by amitriptyline and FMRF-amide is removed by serine proteases, *Channels* (6):419-428.
- [10] Popescu D., Popescu A.G., Amuzescu B. (2010): Pulsatory liposomes - a possible biotechnological device for controlled drug delivery. I. The liposome swelling. *Rom J Biophys.* 20(1):37-46.
- [11] Popescu D., Popescu A.G., Amuzescu B., Maries E. (2010): Pulsatory liposomes - a possible biotechnological device for controlled drug delivery. II. The pore appearance, *Rom J Biophys.* 20(2):171-181.
- [12] Popescu A.G., Popescu D., Ion S., Amuzescu B. (2010): Pulsatory liposomes - a possible biotechnological device for controlled drug delivery. III. The liposome relaxation, *Rom J Biophys.* 20 20(3):223-234.
- [13] Bichir C.L., Georgescu A., Amuzescu B., Nistor G., Popescu M., Flonta M.-L., Corlan A.D., Svab I. (2011): Limit cycles by FEM for a one-parameter dynamical system associated to the Luo-Rudy I model, *ROMAI J.* 6(2):27-39.
- [14] Corlan A.D., Amuzescu B., Milicin I., Iordachescu V., Poenaru E., Corlan I., De Ambroggi L. (2011): Intercellular conductance variability influences early repolarization potentials in a myocardial tissue model with stochastic architecture, *Advanced Topics in Electrical Engineering* (IEEE Proceedings, ISSN 2068-7966):1-4. [http://ieeexplore.ieee.org/xpl/freeabs\\_all.jsp?arnumber=5952183](http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5952183)
- [15] Chioncel V., Paun D., Amuzescu B., Sinescu C. (2012): Evolution features of hypertensive patients with primary aldosteronism - prospective study, *J. Med. Life* 5(3): 354-359.
- [16] Kusko M., Craciunoiu F., Amuzescu B., Halitzchi F., Selescu T., Radoi A., Popescu M., Simion M., Bragaru A., Ignat T. (2012): Design, fabrication and characterization of a low-impedance 3D electrode array system for neuro-electrophysiology, *Sensors* (Basel) 12(12):16571-16590.
- [17] Amuzescu B., Georgescu A., Nistor G., Popescu M., Svab I., Flonta M.-L., Corlan A. (2012): Stability and sustained oscillations in a ventricular cardiomyocytes model, *Interdisciplinary Sciences: Computational Life Sciences* 4(1):1-18.
- [18] Amuzescu B., Scheel O., Knott T. (2014): Novel automated patch-clamp assays on stem cell-derived cardiomyocytes: will they standardize in vitro pharmacology and arrhythmia research? *J Phys Chem. Biophys.* 4(4):153 <http://dx.doi.org/10.4172/2161-0398.1000153>
- [19] Chevalier M., Amuzescu B., Gawali V., Todt H., Knott T., Scheel O., Abriel H. (2014): Late cardiac sodium current can be assessed using automated patch-clamp, *F1000Research* <http://f1000research.com/articles/3-245/v1>
- [20] Scheel O., Frech S., Amuzescu B., Eisfeld J., Lin K.-H., Knott T. (2014): Action potential characterization of human induced pluripotent stem cell-derived cardiomyocytes using automated patch-clamp technology, *Assay Drug Dev Technol.* 12(8):457-69

### Patents

Iacobas A.D., Amuzescu B., Ciontu Cristina: Manufacturing procedure for micropipettes for single-channell recordings in biomembranes - Patent RO-102203/06.10.1988

Iacobas A.D., Amuzescu B.: Procedure and device for cleaning patch-clamp micropipettes - Patent RO-108844/04.11.1991

### Books

Amuzescu B, Avram S, Macri B: *Lucrari practice de biofizica*, Editura Universitatii din Bucuresti, 2005, ISBN 973575980-2

Amuzescu B, Mubagwa K: Cardiac Ion Channels and Transporters, in *From Vascular Cell Biology to Cardiovascular Medicine*, A. Georgescu, F. Antohe (eds.), Research Signpost, Kerala, 2011, ISBN 978-81-7895-503-2

Amuzescu B, Istrate B, Musat S: Channelopathies and Heart Disease, in *Cardiac Arrhythmias: from Basic Mechanisms to State-of-the-art Management*, Kibos et al. (eds.), Springer, 2014, ISBN 978-1-4471-5315-3

Amuzescu B, Corlan D, Nistor G: *Modelarea matematica a electrofiziologiei cardiace*, Editura Universitatii din Bucuresti, 2012, ISBN 978-606-16-0145-5

Amuzescu B: *Modelarea matematica a sistemelor biologice complexe*, in *Problema minte-creier in neurostiinta cognitiei*, Vacariu G., Stefanov G. (eds.), Editura Universitatii din Bucuresti, 2013, ISBN 978-606-16-0224-7

Amuzescu B., Istrate B., Mubagwa K: Impact of Cellular Mechanisms of Ischemia on CABG Failure, in *Coronary Graft Failure: State-of-the-Art*, Ion C. Tintoiu, Malcolm John Underwood, Stephane Pierre Cook, Hironori Kitabata, Aamer Abbas (eds.), Springer, New York (*in press*)

## Academic activities

### Coordination/Technical program committee

Coordinator of the Group of Mathematical Modeling of Complex Biological Systems, part of the Research Center in Neurobiology, Department of Biophysics&Physiology, Faculty of Biology, University of Bucharest (<http://neurobiologie.ro/en/Research-Themes-Electrophysiology-and-Mathematical-Modeling-of-Excitable-Systems/>)

2001-present: Teaching staff & co-organizer of the Master in Neurobiology Programme, Department of Biophysics & Physiology, Faculty of Biology, University of Bucharest (<http://www.bio.unibuc.ro>)

2006-2008: Coordinator of Grant CNCSIS A 1030/2006 - "Modulation of ENaC/Deg ion channels by intracellular divalent cations and their roles in neuronal ischemia-putative pharmacological targets in stroke therapy"

2004-2012: Advisory board, Romanian Society of Neuroscience, Bucharest, Romania

Professional membership: Biophysical Society, American Association for the Advancement of Science, Federation of American Societies for Experimental Biology, Federation of European Neuroscience Societies

### Reviewer/EB member

European Journal of Pharmacology, European Journal of Biophysics, Journal of Neuroscience Methods, Central European Journal of Biology, American Journal of Modern Physics, Natural Products Chemistry & Research

### Courses

- neurobiophysics (<http://www.bio.unibuc.ro/old/old/bogdan/neurobiophysics/neurobiophysics.htm>)
- anatomy&physiology (<http://www.bio.unibuc.ro/old/old/bogdan/physiology/physiology.htm>)
- data processing (<http://www.bio.unibuc.ro/old/old/bogdan/dataproc/dataproc.htm>)
- clinical diagnosis & therapy

## Projects

1999-2002, World Bank Grant D-22 "Development of an advanced studies & PhD program in molecular physiology centered on neurobiology & membrane biophysics of excitable and nonexcitable cells" (100000 USD)

1999-2002, World Bank Grant PU-19 "Modernizing and optimizing physiology teaching via equilibrated use of interactive computer-assisted training and electrophysiology techniques" (225000 USD)

1999-2002, World Bank Grant B-50 "Molecular Physiology: Electrophysiology techniques and computer modeling of cellular/molecular interactions" (525000 USD)

2000, Flanders-Romania bilateral agreement BIL96 (180000 EUR)

2001-2003, Flanders-Romania bilateral agreement BIL00 (74000 EUR)

2001-2004, Volkswagen Foundation research grant: "Generation of spontaneous activity in damaged nerve: novel experimental approaches" (135000 EUR)

2000-2002, NATO grant CLG976246 "Mechanisms of diabetic neuropathic pain in the primary sensory neurone" (20000 USD)

2003-2004, Postdoctoral research grant - Dept. Exp. Surgery&Anaesthesiology, KULeuven, Belgium (15000 EUR)

2002-2003, CERES 1/3/2002 "In vitro study of changes within the intracellular signaling network during energy deprivation stress" (10000 EUR)

2003-2005, VIASAN 199/2003 "Modulation mechanisms of ion channels activated by tissue acidosis in peripheral nerve fibers and blood vessels" (50000 EUR)

2005-2008, CEEX 67/2005 "Health protection by development of new complex instruments (laboratory-on-a-chip)" (28570 EUR)

2006-2007, CNCSIS 1030/2006 "Modulation of ENaC/Deg ion channels by intracellular divalent cations and their roles in neuronal ischemia-putative pharmacological targets in stroke therapy" (22857 EUR) (grant coordinator)

2005-2010, CEEEX 3191/2005 "Molecular, cellular, and integrated pain mechanisms-medical applications" (100000 EUR)  
2007-2010, PNCDI2 Cooperation Grant 61-010/2007 "Mathematical modeling of the electrical activity of neurons and cardiomyocytes - isolated and in tissue - applied to prediction of arrhythmia and response to antiarrhythmics" (500000 EUR)  
2012-2016, PNCDI2 Cooperation Grant 80/2012 "Cellular Therapeutic Approaches for Regenerative Stroke Therapy" (465000 EUR) (partner coordinator)