

# GERGELY KOVACS

## PERSONAL INFORMATION

Date of Birth: March 31, 1975  
 Citizenship: Hungarian

## EDUCATION

<b>Institution</b>	<b>Degree</b>	<b>Year</b>
Semmelweis Univ. Med. School, Budapest, Hungary	M.D.	1999
Semmelweis Univ. Graduate School, Budapest Hungary	Ph.D.	2003

## RESEARCH EXPERIENCE

- 2011 – 2013 Research Associate (Oberassistent), Institute of Biochemistry and Molecular Medicine, University of Bern, Bern, Switzerland (Group leader: Prof. Matthias A. Hediger)  
 Project 1: Continuation of projects 1 and 4 from the period 2007-2010.  
 Project 2: Development of high-throughput screening assays against different ion channels and transporters
- Develop fluorescence high-throughput assay against TRPV5 (epithelial calcium channel), P2X<sub>4</sub> (ATP-gated calcium channel), TRPM4 (TRP channel), ZIP2 (zinc transporter) using FLIPR Tetra fluorescence, HTS microplate reader
- 2007 - 2010 Postdoctoral Scholar (Assistant), Institute of Biochemistry and Molecular Medicine, University of Bern, Bern, Switzerland (Group leader: Prof. Matthias A. Hediger)  
 Project 1: Study the function, the regulation and pharmacology of TRPV6 by ion imaging and radioactive uptake assays  
 Project 2: Establish confocal microscope facility  
 Project 3: Study the expression of the epithelial calcium channel TRPV6 in different organs based on immunohistochemistry,  
 Project 4: Drug development against the epithelial calcium channel, TRPV6 (in collaboration with Prof. Jean-Louis Reymond and Dr. Martin Lochner chemists)  
 Used FLIPR Tetra HTS microplate reader and ion imaging techniques to develop cadmium-based high-throughput screening assay for TRPV6 to test small chemical compounds selected by chemists using 3D virtual screening method  
 Project 5: Investigate the role of TRPV6 in breast cancer
- 2002 - 2006 Postdoctoral scholar, Department of Physiology and Biophysics, University of Alabama at Birmingham, Birmingham, AL, USA (Group leader: Prof. Dale J Benos and Catherine M Fuller)  
 Project: Differences in the regulation calcium homeostasis between astrocytes and glioblastoma cells
- Examine the function and the regulation of store-operated calcium channels in glioblastoma cells using fluorescence microfluorimetry and ion imaging techniques

1999 - 2001 PhD thesis work, Division of Nephrology, Department of Medicine, University of Alabama at Birmingham, Birmingham, AL, USA (Group leader: Prof. P. Darwin Bell)

Thesis title: Regulation of the apical Na:2Cl:K cotransporter in macula densa

- Study the regulation of Na:2Cl:K cotransporter by angiotensin II and nitric oxide in macula densa cells using fluorescence ion imaging technique and microperfusion of microdissected tubules from rabbit

### **UNIVERSITY TEACHING ACTIVITIES**

Instructor, 1997-1999, Medical Pathophysiology, Semmelweis Univ. Med. School, Budapest, Hungary

Lecturer, 2013, Membrane Biochemistry in Health and Disease course, Institute of Biochemistry and Molecular Medicine, University of Bern, Bern, Switzerland

### **MENTORING**

Katrin Bolanz	Graduate Student	2010
Stefanie Graeter	Bachelor Student	2011
Stefanie Graeter	Master Student	2013
Marie-Christine Franz	Graduate Student	

### **AWARDS**

1997	Graduate Student's Research Symposium, 2nd place winner, Budapest, Hungary
1997	University Science Projects sponsored by the Rector, 1st place winner, Budapest, Hungary
1998	Graduate Student's Research Symposium, honorable mention, Budapest, Hungary
1999	University Science Projects sponsored by the Rector, 2nd place winner, Budapest, Hungary
2001	Trainee Research Symposium, Dept. of Medicine, UAB, the Joseph Reeves Awardwinner, Birmingham, Alabama, USA

### **MEMBERSHIPS**

2002	Hungarian Society of Nephrology
2002	Hungarian Society of Physiology
2003-	American Physiological Society

### **LANGUAGES**

Native language:	Hungarian
Second languages:	English: fluent (B2 level exam, 2008)

### **PEER-REVIEWED PUBLICATIONS: (Journal Articles 29, 8 First author, 2 last author))**

1. PETI-PETERDI J, P HAMAR, G KOVACS AND L ROSIVALL. Direct in vivo measurement of gastric microvascular pressures in the rat. *Microvasc. Res.* 55(3):223-229, 1998. IF: 1.496 Citations: 2, 2
2. PETI-PETERDI J, G KOVACS, P HAMAR AND L ROSIVALL. Hemodynamics of the gastric microcirculation in the rat. *Am. J. Physiol.* 275:H1404-1410, 1998. IF: 3.077 Citations: 5, 4
3. HAMAR P, J PETI-PETERDI, ZS RAZGA, G KOVACS, U HEEMANN, AND L ROSIVALL. Coinhibition of immune and renin-angiotensin systems reduces the pace of glomerulosclerosis in the rat remnant kidney. *J. Am. Soc. Nephrol.* 10:S234-S238, 1999. IF: 6.182 Citations: 21, 18
4. HAMAR P, A SZABO, G KOVACS, G KOKENY, U HEEMANN AND L ROSIVALL. Inhibition of IL-2 synthesis reduces the progression of chronic kidney allograft rejection in rat. *Hypertension & Nephrol.* 10:S225-S229, 1999. (hungarian)
5. KOVACS G, J PETI-PETERDI, L ROSIVALL AND PD BELL. Angiotensin II directly stimulates macula densa Na:2Cl:K cotransport via apical AT<sub>1</sub> receptors. *Am. J. Physiol* 282:F301-306, 2002. IF: 5.044 Citations: 37, 33
6. LIU R, PD BELL, J PETI-PETERDI, G KOVACS, A JOHANSSON AND AEG PERSSON. Identification of purinergic receptors on rabbit macula densa cells. *J. Am. Soc. Nephrol.* 13: 1145-1151, 2002. IF: 6.404 Citations: 31, 18
7. UNLAP T, E HWANG, G KOVACS, J PETI-PETERDI, B SIROKY, I WILLIAMS AND PD BELL. Dysregulation of [Ca<sup>2+</sup>]<sub>i</sub> in OK-PTH cells expressing a mesangial cell Na<sup>2+</sup>/Ca<sup>2+</sup> exchanger isoform from Dahl/Rapp salt sensitive rat. *Ann. N.Y. Acad. Sci.* 976:338-341, 2002. IF: 1.682 Citations: 0, 0
8. UNLAP T, E HWANG, B SIROKY, J PETI-PETERDI, G KOVACS, I WILLIAMS AND PD BELL. Enhanced susceptibility of a Na<sup>2+</sup>/Ca<sup>2+</sup> exchanger isoform from mesangial cells of salt sensitive Dahl/Rapp rats to oxidative stress inactivation. *Ann. N.Y. Acad. Sci.* 976:342-344, 2002. IF: 1.682 Citations: 1, 0
9. HWANG E, WILLIAMS I, G KOVACS, J PETI-PETERDI, B SIROKY, RICE WC, BATES E, SCHWIEBERT EM, UNLAP T, AND PD BELL. Impaired ability of the Na<sup>2+</sup>/Ca<sup>2+</sup> exchanger from Dahl/Rapp salt sensitive rat to regulate cytosolic calcium. *Am. J. Physiol* 284:F1023-F1031, 2003. IF: 4.344 Citations: 10, 7
10. BELL PD, J-Y LAPOINTE, R SABIROV, S HAYASHI, J PETI-PETERDI, K MANABE, G KOVACS AND Y OKADA. Macula densa cell signaling involves ATP release through a maxi anion channel. *Proc. Natl. Acad. Sci.* 100:4322-4327, 2003. IF: 10.272 Citations: 186, 148
11. UNLAP T, E BATES, C WILLIAMS, P KOMLOSI, WILLIAMS I, G KOVACS, B SIROKY AND PD BELL. Na<sup>+</sup>/Ca<sup>2+</sup> Exchanger. Target for Oxidative Stress in Salt-Sensitive Hypertension. *Hypertension* 42:363-368, 2003. IF: 5.63 Citations: 11, 9
12. KOVACS G, P KOMLOSI, AL FUSON, J PETI-PETERDI, L ROSIVALL AND PD BELL. Neuronal nitric oxide synthase: Its role and regulation in macula densa cells. *J. Am. Soc. Nephrol.* 14:2475-2483, 2003. IF: 7.499 Citations: 32, 21
13. WILLIAMS I, C WILLIAMS, B SIROKY, E BATES, G KOVACS, J PETI-PETERDI, UNLAP T AND PD BELL. Regulation of mesangial cell Na<sup>+</sup>/Ca<sup>2+</sup> exchanger isoforms. *J Cell Physiol* 199(2):181-93, 2004. IF: 5.222 Citations: 2, 1
14. KOVACS G, A ZSEMBERY, SJ ANDERSON, P KOMLOSI, GY GILLESPIE, PD BELL, DJ BENOS AND CM FULLER. Changes in intracellular Ca<sup>2+</sup> and pH in response to thapsigargin in human glioblastoma cells and normal astrocytes. *Am J Physiol* 289:C361-C371, 2005. IF: 3.942 Citations: 15, 15
15. UNLAP MT, C WILLIAMS, D MORIN, B SIROKY, A FINTHA, A FUSON, L DODGEN, G KOVACS, P KOMLOSI, W FERGUSON AND PD BELL. Amyloid beta peptide 1-40 stimulates the Na<sup>+</sup>/Ca<sup>2+</sup> exchange activity of SNCX. *Curr Neurovasc Res.* 2:3-12, 2005. IF: 1.425 Citations: 2, 1

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16. FULLER CM, G KOVACS, S ANDERSON, AND DJ BENOS. The CLCAs: Proteins with ion channel, cell adhesion and tumor suppressor functions in “Defects of Secretion in Cystic Fibrosis”, *Adv. Exp. Biol. Me.* 558: 83-10, 2005. IF: 0.635 Citations: 1, 0
  17. VILA-CARRILES WH, GG KOVACS, B JOVOV, ZH ZHOU, AK PAHWA, G COLBY, O ESIMAI, GY GILLESPIE, TB MAPSTONE, JM MARKERT, CM FULLER, JK BUBIEN AND DJ BENOS. Surface expression of ASIC2 inhibits the amiloride-sensitive current and migration of glioma cells. *J Biol Chem* 281(28):19220-32, 2006. IF: 5.808 Citations: 51, 42
  18. KOVACS GG, KA BOLANZ, C LANDOWSKI AND MA HEDIGER. Tamoxifen inhibits TRPV6 activity via estrogen receptor independent pathways in TRPV6 expressing MCF-7 breast cancer cells. *Mol Cancer Res* 7(12):2000-10, 2009. IF:4.162 Citations: 18, 17
  19. KOVACS G, T DANKO, MJ BERGERON, B BALAZS, Y SUZUKI, A ZSEMBERY AND MA HEDIGER. Heavy metal cations permeate the TRPV6 epithelial cation channel. *Cell Calcium* 49(1):43-55, 2011. IF: 3.766 Citations: 15, 11
  20. BERGERON MJ, M BUERZLE, G KOVACS, A SIMONIN, AND MA HEDIGER. Synthesis, maturation and trafficking of human Na<sup>+</sup>-dicarboxylate cotransporter NaDC1 requires the chaperone activity of cyclophilin B. *J Biol Chem* 286(13):11242-53, 2011. IF: 4.773 Citations: 6, 5
  21. KOVACS G, N MONTALBETTI, A SIMONIN, T DANKO, B BALAZS, A ZSEMBERY AND MA HEDIGER. Inhibition of the human epithelial calcium channel TRPV6 by 2-aminoethoxydiphenyl borate (2-APB). *Cell Calcium* 52(6):468-80, 2012. IF: 4.327 Citations: 13, 9
  22. HOFER A, G KOVACS, A ZAPPATINI, M LEUENBERGER, MA HEDIGER, AND M LOCHNER. Design, synthesis and pharmacological characterization of analogs of 2-aminoethyl diphenylborinate (2-APB), a known store-operated calcium channel blocker, for inhibition of TRPV6-mediated calcium transport. *Bioorg Med Chem*, 21(11):3202-13, 2013. IF: 2.951 Citations: 4, 3
  23. DEISL C, A SIMONIN, M ANDEREGG, G ALBANO, G KOVACS, D ACKERMANN, H MOCH, W DOLCI, B THORENS, MA HEDIGER, AND DG FUSTER. Sodium/hydrogen exchanger NHA2 is critical for insulin secretion in  $\beta$ -cells. *Proc Natl Acad Sci U S A.* 110(24):10004-9, 2013. IF: 9.809 Citations: 4, 2
  24. BALAZS B, T DANKO, G KOVACS, L KOLES, MA HEDIGER and Á ZSEMBERY. Investigation of the inhibitory effects of the benzodiazepine derivative, 5-BDBD on P2X4 purinergic receptors by two complementary methods. *Cell Physiol Biochem* 32(1):11-24, 2013. IF: 3.55 Citations: 0, 1
  25. KOVACS G, N MONTALBETTI, M-C FRANZ, S GRAETER, A SIMONIN AND MA HEDIGER. Human TRPV5 and TRPV6: key players in cadmium and zinc toxicity. *Cell Calcium* 54:276– 286, 2013. IF: 4.21 Citations: 1, 1
  26. MONTALBETTI N, A SIMONIN, G KOVACS AND MA HEDIGER. Mammalian iron transporters: Families SLC11 and SLC40. *Mol Aspects Med* 34 (2–3): 270–287, 2013. IF: 10.302 Citations: 8, 6
  27. FRANZ M-C, P ANDERLE, M BURZLE, Y SUZUKI, MR FREEMAN, MA HEDIGER AND G KOVACS. Zinc transporters in prostate cancer. *Mol Aspects Med* 34 (2–3): 735–741, 2013, IF: 10.302 Citations: 6, 5
  28. MONTALBETTI N, A SIMONIN, MG DALGHI, G KOVACS AND MA HEDIGER. Development and Validation of a Fast and Homogeneous Cell-Based Fluorescence Screening Assay for Divalent Metal Transporter 1 (DMT1/SLC11A2) Using the FLIPR Tetra. *J Biomol Screen* 2014 19(6):900-908 Citations: 0, 0
  29. FRANZ M-C, A SIMONIN, S GRAETER, MA HEDIGER AND G KOVACS. Development of the first fluorescence screening assay for the SLC39A2 zinc transporter. *J Biomol Screen* 2014 19(6):909-916 Citations: 0, 0