

CURRICULUM VITAE and PUBLICATIONS

Prof. Matthias A. Hediger

Until 31.01.2019:

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A. Personal Data

Date of birth: August 7, 1953
Civil status: Married, one child

Nationality: Swiss
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B. Education and Training

1983 Dr. sc. nat. ETH (Ph.D.) Swiss Federal Institute of Technology, Switzerland
1977 Dipl. sc. nat. (Biochemistry) Swiss Federal Institute of Technology, Switzerland

C. Positions and Awards

Professional Positions:

May 2005- Professor Ordinarius, Institute of Biochemistry and Molecular Medicine, University of Bern, Switzerland.
2005-2016 Director, Institute of Biochemistry and Molecular Medicine, University of Bern, Switzerland.
1999-2005 Director, Membrane Biology Program, Brigham and Women's Hospital, Harvard Medical School, Boston, USA.
1995-2005 Associate Professor of Medicine (Biological Chemistry and Molecular Pharmacology), Harvard Medical School, Boston, MA, USA.
1989-1995 Assistant Professor of Medicine, Harvard Medical School, Boston, MA, USA.
1986-1989 Assistant Research Physiologist, Dept. of Physiology, UCLA School of Medicine, Los Angeles, CA, USA.
1984-1986 Postgraduate Research Biochemist, Dept. of Biological Chemistry, UCLA School of Medicine, Los Angeles, CA, USA.
1982-1983 Postgraduate Research Biochemist, Dept. of Biochemistry, University of Connecticut Health Center, Farmington, CT, USA.

Selection of Awards and Professional Activities:

2018 Invited speaker at MDO/JSSX International Joint Meeting, Kanazawa, Japan.
2017 Organizer BioMedical Transporters Conference, Lausanne "SLC Transporters and Ion Channels in Drug Discovery and Preclinical Development" August 6-10
2016 Invited speaker at the New York Academy of Sciences, USA. Symposium on "Solute Carrier Proteins: Unlocking the Gene-Family for Effective Therapies".
2016 Guest Editor, special issue "Membrane Transporters: Solute Carriers"; Guest Edited by Prof Matthias A. Hediger & Dr David Hepworth (Pfizer); *Med. Chem. Comm.* (Royal Society of Chemistry), Volume 7, 2016. *This collection of articles is a celebration of all areas of research where the chemical sciences have impacted the study of the SLC solute carrier superfamily.*
2015 Organizer BioMedical Transporters Conference, Lugano "Membrane Transporters – from Basic Science to Drug Discovery" August 9-13

- 2013 Organizer BioMedical Transporters Conference, St. Moritz, “Transporters and Channels in Drug Discovery and Preclinical Development”, August 11-15
- 2013 Guest Editor, special issue “The ABCs of membrane transporters in health and disease (SLC series); *Molecular Aspects of Medicine*, Volume 34, Issues 2-3, April/June 2013 (*total of 50 reviews on SLC solute carrier families*)
- 2011 Organizer BioMedical Transporters Conference, Grindelwald, “Membrane Transporters in Drug Discovery”, August 7-11
- 2009 Japanese Society for the Study of Xenobiotics Award (Kyoto, Japan)
- 2009 Chair USGEB Meeting 2009: Membranes in Motion, January 29-30, Interlaken, Switzerland <http://www.bioparadigms.org/biomedical09/USEGB%202009/index.html>
- 2003-2005 Vice Chair, Steering Committee, Epithelial Transport Group, American Physiological Society
- 2003 Rank Prize Funds, Surrey, UK *Award in recognition of work on the identification, molecular characterization and control of cellular nutrient transporters*
- 1998 Recipient of an award to support interdisciplinary and interdepartmental research at Brigham and Women’s Hospital
- 1996 Visiting Professor, University College London
- 1995- Specialist Advisor, HUGO Gene Nomenclature Committee (<http://www.gene-names.org>)
- 1995 Partners Research Task Force Award of Massachusetts General Hospital and Brigham and Women’s Hospital to support new joint studies
- 1989 Annual Award for Excellence in Renal Research in recognition of research of the human Na⁺/glucose cotransporters. American Physiological Society

Societies:

American Physiological Society (APS)
 International BioIron Society (IBS)
 Life Sciences Switzerland (LS2)
 Biochemische Vereinigung Bern (BVB)

D. Patents

1. US Patent No. 7,371,536: “Methods for transporting vitamin C”, issued May 13, 2008.
2. US Patent No. 6,534,642: “Compositions corresponding to a calcium transporter and methods of making and using same”, issued March 18, 2003
3. US Patent No. 5,849,525: “Compositions corresponding to a proton-coupled peptide transporter and methods of making and using same”, issued December 15, 1998.
4. US Patent No. 5,739,284: “Compositions corresponding to a high-affinity glutamate transporter molecule and methods for making and using same”, issued April 14, 1998.
5. US Patent No. 5,441,875: “Urea transporter polypeptide”, issued August 15, 1995.

E. Current funding (PI: Hediger MA)

1. *Iron transporters*. Swiss National Center of Competence in Research (NCCR) TransCure, PI Matthias Hediger. Funding period: November 1, 2014 – October 31, 2018.
Note: NCCR TransCure has been initiated and directed by Matthias Hediger starting on November 1, 2010. The leading house is the University of Bern. As of January 2015, the current Director is Hugues Abriel (www.nccr-transcure.ch). TransCure is composed of 19 scientific laboratories affiliated at Universities in Basel, Bern, Lausanne and Zurich.

2. *Store-operated calcium channels in health and disease*. Sinergia, Swiss National Science Foundation. PI Matthias Hediger, CO-PI Nicolas Demaurex and Martin Lochner. Funding period: October 1, 2015 – September 30, 2018.
3. *The role of neutral amino acid transporters in colorectal cancer progression*. Swiss Cancer League, PI Matthias Hediger. Co-PI Inti Zlobec. May 1, 2017 – April 30, 2020.
4. *Compound screening on solute carrier SLC15A4 to targeting for lupus autoimmune disease*. CTI, PI Matthias Hediger. Funding period: June 1, 2018 – November 30, 2019.
5. *The role of mitochondrial carriers in metabolic tuning and reprogramming by calcium flow across membrane contact sites*. Sinergia, Swiss National Science Foundation. PI Matthias Hediger, Co-PI Martin Lochner and Edmund Kunji. Funding period: 4 years.
6. Institutional credit and various other funding sources.

F. Teaching and Professional Training

1. Membrane Biochemistry (yearly Master lecture series since year 2007)
2. Lectures to veterinary medicine (VetSuisse) and medical students.
Head of Endocrinology Block for 2nd year medical students.
3. Supervision and training of 5 Bachelor and 3 Master students (past 7 years)
4. Supervision of students, completing doctoral theses in biology (past 7 years)
Katrín A. Bolanz (January 2010)
Marc Bürzle (October 2012)
Marie-Christine Franz (April 2015)
5. Post-doctoral training and visiting professors
Over the past 25 years, Matthias Hediger has supervised and trained 44 post-doctoral researchers. In addition, he has hosted two Visiting Professors. The majority of the post-doctoral trainees and PhD thesis graduates are currently holding faculty positions at major Universities or research positions at pharmaceutical companies. Examples: Michael Romero (full professor in physiology, Mayo Clinic, USA); Yoshikatsu Kanai (full professor in pharmacology, Osaka University, Japan), Marie-Christine Franz (Deputy Manager, CSL Behring AG, Switzerland).

G. Peer-Reviewed Original Papers

1. Franz MC, Pujol-Gimenez J, Montalbetti N, Fernandez-Tenorio M, DeGrado TR, Niggli E, Romero MF, **Hediger MA**. Reassessment of the transport mechanism of the human zinc transporter SLC39A2. *Biochemistry* 2018 [Epub ahead of print]
2. Cléménçon B, Lüscher BP, **Hediger MA**. Establishment of a novel microscale thermophoresis ligand-binding assay for characterization of SLC solute carriers using oligopeptide transporter PepT1 (SLC15 family) as a model system. *J Pharmacol Toxicol Methods* 2018;**92**:67-76.
3. Pujol-Giménez J, **Hediger MA**, Gyimesi G. A novel proton transfer mechanism in the SLC11 family of divalent metal ion transporters. *Sci Rep.* 2017;**7**:6194.
4. Dalghi MG, Ferreira-Gomes M, Montalbetti N, Simonin A, Strehler EE, **Hediger MA**, Rossi JP. Cortical cytoskeleton dynamics regulates plasma membrane calcium ATPase isoform-2 (PMCA2) activity. *Biochim Biophys Acta.* 2017;**1864**:1413-1424.
5. Lüscher BP, Marini C, Jorger-Messerli M, Huang X, **Hediger MA**, Albrecht C, Baumann MU, Surbek DV. Placental glucose transporter (GLUT)-1 is down-regulated in preeclampsia. *Placenta* 2017;**55**:94-99

6. Cl men on B, Fine M, **Hediger MA**. Conservation of the oligomeric state of native VDAC1 in detergent micelles. *Biochimie*. 2016;**127**:163-72.
7. Leuenberger M, Ritler A, Simonin A, **Hediger MA**, Lochner M. Concise Asymmetric Synthesis and Pharmacological Characterization of All Stereoisomers of Glutamate Transporter Inhibitor TFB-TBOA and Synthesis of EAAT Photoaffinity Probes. *ACS Chem Neurosci*. 2016;**7**:534-9.
8. Dhayat N, Simonin A, Anderegg M, Pathare G, L scher BP, Deisl C, Albano G, Mordasini D, **Hediger MA**, Surbek DV, Vogt B, Sass JO, Kloeckener-Gruissem B, Fuster DG. Mutation in the Monocarboxylate Transporter 12 Gene Affects Guanidinoacetate Excretion but Does Not Cause Glucosuria. *J Am Soc Nephrol*. 2016;**27**:1426-36.
9. Simonin A, Montalbetti N, Gyimesi G, Pujol-Gim nez J, **Hediger MA**. The Hydroxyl Side Chain of a Highly Conserved Serine Residue Is Required for Cation Selectivity and Substrate Transport in the Glial Glutamate Transporter GLT-1/SLC1A2. *J Biol Chem*. 2015;**290**:30464-74.
10. Simonin C, Awale M, Brand M, van Deursen R, Schwartz J, Fine M, Kovacs G, H fliger P, Gyimesi G, Sithampari A, Charles RP, **Hediger MA**, Reymond JL. Optimization of TRPV6 Calcium Channel Inhibitors Using a 3D Ligand-Based Virtual Screening Method. *Angew Chem Int Ed Engl*. 2015;**54**:14748-52.
11. C sar-Razquin A, Snijder B, Frappier-Brinton T, Isserlin R, Gyimesi G, Bai X, Reithmeier RA, Hepworth D, **Hediger MA**, Edwards AM, Superti-Furga G. A Call for Systematic Research on Solute Carriers. *Cell*. 2015;**162**:478-87.
12. Damseh N, Simonin A, Jalas C, Picoraro JA, Shaag A, Cho MT, Yaacov B, Juusola J, Al-Ashhab M, Bale S, Telegrafi A, Retterer K, Pappas JG, Cappell J, Yeboa KA, Abu-Libdeh B, **Hediger MA**, Chung WK, Elpeleg O, Edvardson S. Mutations in SLC1A4, encoding the brain serine transporter, associated with developmental delay, microcephaly and hypomyelination. *J Med Genet*. 2015;**52**:541-7.
13. Montalbetti N, Simonin A, Simonin C, Awale M, Reymond JL, **Hediger MA**. Discovery and characterization of a novel non-competitive inhibitor of the divalent metal transporter DMT1/SLC11A2 *Biochem Pharmacol*. 2015;**96**:216-24.
14. Cl men on B, Fine M, Schneider P, **Hediger MA**. Rapid method to express and purify human membrane protein using the *Xenopus* oocyte system for functional and low-resolution structural analysis. *Methods Enzymol*. 2015;**556**:241-65.
15. Cl men on B, L scher BP, Fine M, Baumann MU, Surbek DV, Bonny O, **Hediger MA**. Expression, purification, and structural insights for the human uric acid transporter, GLUT9 using the *Xenopus laevis* oocytes system. *PLoS ONE*. 2014;**9**:e108852.
16. Franz MC, Simonin A, Graeter S, **Hediger MA**, Kovacs G. Development of the first fluorescence screening assay for SLC39A2 zinc transporter. *J Biomol Screen*. 2014;**19**:909-16.
17. Montalbetti N, Simonin A, Dalghi MG, Kov cs G, **Hediger MA**. 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**:900-8.
18. Cl men on B, Fine M, L scher B, Baumann MU, Surbek DV, Abriel H, **Hediger MA**. Expression, purification, and projection structure by single particle electron microscopy of functional human TRPM4 heterologously expressed in *Xenopus laevis* oocytes. *Protein Expr Purif*. 2014;**95**:169-76.
19. Marini C, L scher BP, Jorger-Messerli M, Sager R, Huang X, Gertsch J, **Hediger MA**, Albrecht C, Baumann MU, Surbek DV. Placental Glucose Transporter (GLUT1) expression in pre-eclampsia. *Reprod Sci*. 2014;**21**:1A-70A.

20. Jain A, Schneider H, Aliyev E, Soydemir F, Baumann M, Surbek D, **Hediger MA**, Brownbill P, Albrecht C. Hypoxic treatment of human dual placental perfusion induces a pre-eclampsia-like inflammatory response. *Lab Invest.* 2014;**94**:873-80.
21. Marini C, Lüscher BP, Surbek D, Messerli M, Sager R, Albrecht C, **Hediger MA**, Baumann M. Placental glucose transporter GLUT1 expression in pre-eclampsia. *Placenta.* 2013;**34**:A88.
22. Kovács G, Montalbetti N, Franz MC, Graeter S, Simonin A, **Hediger MA**. Human TRPV5 and TRPV6: key players in cadmium and zinc toxicity. *Cell Calcium.* 2013;**54**:276-86.
23. Hofer A, Kovács G, Zappatini A, Leuenberger M, **Hediger MA**, Lochner M. 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.* 2013;**21**:3202-13.
24. Deisl C, Simonin A, Anderegg M, Albano G, Kovács G, Ackermann D, Moch H, Dolci W, Thorens B, **Hediger MA**, Fuster DG. Sodium/hydrogen exchanger NHA2 is critical for insulin secretion in β -cells. *Proc. Natl. Acad. Sci. USA* 2013;**110**:10004-9.
25. Bürzle M, Suzuki Y, Ackermann D, Miyazaki H, Maeda N, Cléménçon B, Burrier R, **Hediger MA**. The sodium-dependent ascorbic acid transporter family SLC23. *Mol Aspects Med.* 2013;**34**:436-54.
26. Boggavarapu R, Jeckelmann J-M, Harder D, Schneider P, Ucurum Z, **Hediger MA**, Fotiadis D. Expression, purification and low-resolution structure of human vitamin C transporter SVCT1 (SLC23A1). *PLoS ONE.* 2013;**8**:e76427.
27. Balázs B, Dankó T, Kovács G, Köles L, **Hediger MA**, Zsembery Á. Investigation of the inhibitory effects of the benzodiazepine derivative, 5-BDBD on P2X4 purinergic receptors by two complementary methods. *Cell Physiol Biochem.* 2013;**32**:11-24.
28. Kovács G, Montalbetti N, Simonin A, Danko T, Balazs B, Zsembery A, **Hediger MA**. Inhibition of the human epithelial calcium channel TRPV6 by 2-aminoethoxydiphenyl borate (2-APB). *Cell Calcium.* 2012;**52**:468-80.
29. Bergeron MJ, Boggavarapu R, Meury M, Ucurum Z, Caron L, Isenring P, **Hediger MA**, Fotiadis D. Frog oocytes to unveil the structure and supramolecular organization of human transport proteins. *PLoS One.* 2011;**6**:e21901.
30. Bergeron MJ, Bürzle M, Kovács G, Simonin A, **Hediger MA**. Synthesis, maturation, and trafficking of human Na⁺-dicarboxylate cotransporter NaDC1 requires the chaperone activity of cyclophilin B. *J Biol Chem.* 2011;**286**:11242-53.
31. Kovács G, Danko T, Bergeron MJ, Balazs B, Suzuki Y, Zsembery A, **Hediger MA**. Heavy metal cations permeate the TRPV6 epithelial cation channel. *Cell Calcium.* 2011;**49**:43-55.
32. Landowski CP, Bolanz KA, Suzuki Y, **Hediger MA**. Chemical inhibitors for the calcium entry channel TRPV6. *Pharm Res.* 2011;**28**:322-30.
33. Dutzler R, Ernst B, **Hediger MA**, Keppler D, Mohr P, Neidhart W, Märki HP. Channels and transporters. Mini-symposium of the Division of Medicinal Chemistry (DMC) of the Swiss Chemical Society (SCS) at the Department of Chemistry, University of Basel, May 27, 2010. *Chimia (Aarau).* 2010;**64**:662-6
34. Bolanz KA, Kovacs GG, Landowski CP, **Hediger MA**. Tamoxifen inhibits TRPV6 activity via estrogen receptor-independent pathways in TRPV6-expressing MCF-7 breast cancer cells. *Mol Cancer Res.* 2009;**7**:2000-10.
35. Sung JM, Cho HJ, Yi H, Lee CH, Kim HS, Kim DK, Abd El-Aty AM, Kim JS, Landowski CP, **Hediger MA**, Shin HC. Characterization of a stem cell population in lung cancer A549 cells. *Biochem Biophys Res Commun.* 2008;**371**:163-7.

36. Benn BS, Ajibade D, Porta A, Dhawan P, **Hediger M**, Peng JB, Jiang Y, Oh GT, Jeung EB, Lieben L, Bouillon R, Carmeliet G, Christakos S. Active intestinal calcium transport in the absence of TRPV6 and calbindin-D9k. *Endocrinology*. 2008;**149**:3196-205.
37. Suzuki Y, Kovacs CS, Takanaga H, Peng JB, Landowski CP, **Hediger MA**. Calcium Channel TRPV6 is involved in murine maternal-fetal calcium transport. *J Bone Miner Res*. 2008;**23**:1249-56.
38. Mackenzie B, Illing AC, **Hediger MA**. Transport model of the human Na⁺-coupled L-ascorbic acid (vitamin C) transporter SVCT1. *Am J Physiol Cell Physiol*. 2008;**294**:C451-9.
39. Bolanz KA, **Hediger MA**, Landowski CP. The role of TRPV6 in breast carcinogenesis. *Mol Cancer Ther*. 2008;**7**:271-9.
40. Suzuki Y, Pasch A, Bonny O, Mohaupt MG, **Hediger MA**, Frey FJ. Gain-of-function haplotype in the epithelial calcium channel TRPV6 is a risk factor for renal calcium stone formation. *Hum Mol Genet*. 2008;**17**:1613-8.
41. Bianco, SDC, Peng JB, Takanaga H, Suzuki Y, Crescenzi A, Kos CH, Zhuang L, Freeman MR, Gouveia CHA, Wu J, Luo H, Mauro T, Brown EM, **Hediger MA**. Marked disturbance of calcium homeostasis in mice with targeted disruption of the Trpv6 calcium channel gene. *J Bone Miner Res*. 2007;**22**:274-85.
42. Mackenzie B, Takanaga H, Hubert N, Rolfs A, **Hediger MA**. Functional properties of multiple isoforms of the human divalent metal-ion transporter DMT1. *Biochem J*. 2007;**403**:59-69.
43. Berger UV, **Hediger MA**. Distribution of the glutamate transporters GLT-1 (SLC1A2) and GLAST (SLC1A3) in peripheral organs. *Anat Embryol*. 2006;**211**:595-606.
44. Konrad M, Schaller A, Seelow D, Pandey AV, Waldegger S, Lesslauer A, Vitzthum H, Suzuki Y, Luk JM, Becker C, Schlingmann KP, Schmid M, Rodriguez-Soriano J, Ariceta G, Cano F, Enriquez R, Juppner H, Bakkaloglu SA, **Hediger MA**, Gallati S, Neuhauss SC, Nurnberg P, Weber S. Mutations in the tight-junction gene claudin 19 (CLDN19) are associated with renal magnesium wasting, renal failure, and severe ocular involvement. *Am J Hum Genet*. 2006;**79**:949-57.
45. Mackenzie B, Ujwal ML, Chang MH, Romero MF, **Hediger MA**. Divalent metal-ion transporter DMT1 mediates both H⁺-coupled Fe²⁺ transport and uncoupled fluxes. *Pflugers Arch*. 2006;**451**:544-558.
46. Takanaga H, Mackenzie B, Peng JB, **Hediger MA**. Characterization of a branched-chain amino-acid transporter (SBAT1/SLC6A15) that is expressed in human brain. *Biochem Biophys Res Commun*. 2005;**337**:892-900.
47. Takanaga H, Mackenzie B, Suzuki Y, **Hediger MA**. Identification of a mammalian proline transporter (SIT1,slc6a20) with characteristics of classical system IMINO. *J Biol Chem*. 2005;**280**:8974-84.
48. Kahr H, Schindl R, Fritsch R, Heinze B, Hofbauer M, Hack M, Mortelmaier M, Groschner K, Peng JB, Takanaga H, **Hediger MA**, Romanin C. CaT1 knock-down strategies fail to affect CRAC channels in mucosal-type mast cells. *J Physiol*. 2004;**557**:121-32.
49. Marciani P, Trotti D, **Hediger MA**, Monticelli G. Modulation of DMT1 activity by redox compounds. *J Membr Biol*. 2004;**197**:91-9.
50. Mackenzie B, Schafer MK, Erickson JD, **Hediger MA**, Weihe E, Varoqui H. Functional properties and cellular distribution of the system A glutamate transporter SNAT1 support specialized roles in central neurons. *J Biol Chem*. 2003;**278**:23720-30.
51. Kos CH, Karaplis AC, Peng JB, **Hediger MA**, Goltzman D, Mohammad KS, Guise TA, Pollak MR. The calcium-sensing receptor is required for normal calcium homeostasis independent of parathyroid hormone. *J Clin Invest*. 2003;**111**:1021-8.

52. Song Y, Peng X, Porta A, Takanaga H, Peng JB, **Hediger MA**, Fleet JC, Christakos S. Calcium transporter 1 and epithelial calcium channel messenger ribonucleic acid are differentially regulated by 1,25 dihydroxyvitamin D3 in the intestine and kidney of mice. *Endocrinology*. 2003;**144**:3885-94.
53. Berger UV, Lu XC, Liu W, Tang Z, Slusher BS, **Hediger MA**. Effect of middle cerebral artery occlusion on mRNA expression for the sodium-coupled vitamin C transporter SVCT2 in rat brain. *J Neurochem*. 2003;**86**:896-906.
54. Tavakkolizadeh A, Berger UV, Stephen AE, Kim BS, Mooney D, **Hediger MA**, Ashley SW, Vacanti JP, Whang EE. Tissue-engineered neomucosa: morphology, enterocyte dynamics, and SGLT1 expression topography. *Transplantation*. 2003;**75**:181-5.
55. Liu Z, Stevens BR, Feldman DH, **Hediger MA**, Harvey WR. K⁺ amino acid transporter KAAT1 mutant Y147F has increased transport activity and altered substrate selectivity. *J Exp Biol*. 2003;**206**:245-254.
56. Zhuang L, Peng JB, Tou L, Takanaga H, Adam RM, **Hediger MA**, Freeman MR. Calcium-selective ion channel, CaT1, is apically localized in gastrointestinal tract epithelia and is aberrantly expressed in human malignancies. *Lab Invest*. 2002;**82**:1755-64.
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58. Gunshin H, Allerson CL, Polycarpou-Schwarz M, Rofts A, Rogers JT, Kishi F, Hentze MW, Rouault TA, Andrews NC, **Hediger MA**. Iron dependent regulation of the divalent metal ion transporter. *FEBS Lett*. 2001;**509**:309-16.
59. Vassilev PM, Peng JB, **Hediger MA**, Brown EM. Single-Channel Activities of the Human Epithelial Ca²⁺ Transport Proteins CaT1 and CaT2. *J Membr Biol*. 2001;**184**:113-120.
60. Trotti D, Peng JB, Dunlop J, **Hediger MA**. Inhibition of the glutamate transporter EAAC1 expressed in *Xenopus* oocytes by phorbol esters. *Brain Res*. 2001;**914**:196-203.
61. Peng JB, Brown EM, **Hediger MA**. Structural conservation of the genes encoding CaT1, CaT2, and related cation channels. *Genomics*. 2001;**76**:99-109.
62. Peng JB, Zhuang L, Berger UV, Adam RM, Williams BJ, Brown EM, **Hediger MA**, Freeman MR. CaT1 expression correlates with tumor grade in prostate cancer. *Biochem Biophys Res Commun*. 2001;**282**:729-34.
63. Vassilev PM, Guo L, Chen XZ, Segal Y, Peng JB, Basora N, Babakhanlou H, Cruger G, Kanazirska M, Ye Cp, Brown EM, **Hediger MA**, Zhou J. Polycystin-2 is a novel cation channel implicated in defective intracellular Ca²⁺ homeostasis in polycystic kidney disease. *Biochem Biophys Res Commun*. 2001;**282**:341-50.
64. Merlin D, Si-Tahar M, Sitaraman SV, Eastburn K, Williams I, Liu X, **Hediger MA**, Madara JL. Colonic epithelial hPepT1 expression occurs in inflammatory bowel disease: transport of bacterial peptides influences expression of MHC class 1 molecules. *Gastroenterology*. 2001;**120**:1666-79.
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70. Shayakul C, Tsukaguchi H, Berger UV, **Hediger MA**. Molecular characterization of a novel urea transporter from kidney inner medullary collecting ducts. *Am J Physiol*. 2001;**280**:F487-94.
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74. Peng JB, Chen XZ, Berger UV, Vassilev PM, Brown EM, **Hediger MA**. A rat kidney-specific calcium transporter in the distal nephron. *J Biol Chem*. 2000;**275**:28186-94.
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77. Chen XZ, Steel A, **Hediger MA**. Functional roles of histidine and tyrosine residues in the H⁺ peptide transporter PepT1. *Biochem Biophys Res Commun*. 2000;**272**:726-730.
78. Zhu T, Chen XZ, Steel A, **Hediger MA**, Smith DE. Differential recognition of ACE inhibitors in *Xenopus laevis* oocytes expressing rat PEPT1 and PEPT2. *Pharm Res*. 2000;**17**:526-32.
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H. Reviews and Editorials

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I. Book Chapters

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K. Editorial Boards/Study Sections

1. Guest Editor, special issue "Membrane Transporters: Solute Carriers"; Guest Edited by Prof Matthias A. Hediger & Dr David Hepworth (Pfizer); *Med. Chem. Comm.* (Royal Society of Chemistry), Volume 7, 2016. *This collection of articles is a celebration of all areas of research where the chemical sciences have impacted the study of the SLC solute carrier superfamily.*
2. 2012-2013 Guest Editor, Molecular Aspects of Medicine (Elsevier Ltd.) special issue entitled: "The ABC of membrane transporters in health and disease (SLC series)". *Includes articles about 52 SLC families.*
3. 2003 Established WEB-based genomic resource based on the articles from Pflügers Archiv of the 43 HUGO approved transporter gene families. See: <http://www.bioparadigms.org>
4. 2003-2004 Guest Editor, European Journal of Physiology (Pflügers Archiv) special issue entitled: "The ABC's of solute carriers: Physiological, pathological and pharmaceutical implications" (Volume 447, Number 5, February 2004). *Includes 43 articles and 240 printed pages.*
5. 2003 Chair, Planning Meeting, BioMedical Transporters 2003, with delegates from the American Association of Pharmaceutical Scientists (AAPS), the European Federation for Pharmaceutical Sciences (EUFEBs), August 18, 2003, Pontresina, Switzerland
6. 2003 Ad hoc Reviewer, NIH/NCI (RFA) "Molecular Targets for Nutrients in Prostate Cancer Research" Study Section Reviewer
7. 2002 Ad hoc Reviewer, NIH/NIDDK GMA2 Special Emphasis Review (gastroenterology)
8. 2001 Ad hoc Reviewer, NIH/NIDDK GMA2 Study Section Reviewer
9. 2001 Ad hoc Reviewer, NIH/NIDDK (RFA) "Transporters and Model Organisms" Study Section Reviewer
10. 2001 Reviewer, Amyotrophic Lateral Sclerosis Association
11. 1995-1997 Ad hoc Reviewer, NIH Neurology C Study Section Reviewer
12. 1991/1992 Reviewer, American Heart Association, Western Peer Review Consortium.

13. 1991- Reviewer of research grants from the Swiss Science Foundation, Wellcome Trust, MRC (UK and Canada), Human Frontier Science Foundation and Israel Science Foundation

L. Research activities

a) *Research goals*

Our research focuses on transport proteins and ion channels that play key roles in physiological processes in the human body. They are gatekeepers in the membranes of cells and organelles and their dysfunction contributes to the pathogenesis of major human diseases such as diabetes, hypertension, cardiovascular diseases, cancer, preeclampsia, osteoporosis and neurodegenerative diseases. The study of the physiology and pathology of transporters provides the foundation for a detailed mechanistic investigation of clinically relevant transporters. Determination of the structure and function of mammalian transporter proteins is also important in rational ligand-based drug design, the process of finding new drugs based on knowledge of molecules that bind to the transporter or channel of interest.

Current projects include:

- Structure, function and therapeutic implications of the SLC11A2/DMT1 iron transporter
- SLC39/ZIP zinc transporter family and role of ZIP8 in pathologies (Hypertension, neurological issues, etc.)
- Store-operated calcium channels in health and disease
- Role of amino acid transporters in colorectal cancer progression
- Investigation of the biology of the peptide/histidine transporter SLC15A4 and its roles in cancer progression and immunosurveillance

b) *NCCR TransCure*

The National Centre of Competence in Research (NCCR) “TransCure” has been initiated and directed by Matthias Hediger starting on November 1, 2010. The leading house is the University of Bern. As of January 2015, the current Director is Hugues Abriel (www.nccr-transcure.ch). TransCure is composed of 20 multidisciplinary scientific laboratories affiliated at Universities in Basel, Bern, Lausanne and Zurich. This team of Swiss academic experts are focused on cellular membrane transporter research and its application to the treatment of human diseases. Using the approach “from transport physiology to the identification of therapeutic targets” researchers are working collaboratively, sharing ideas, and focusing on common proteins and cellular pathways related to membrane transport. These proteins have a great, unexplored potential for the development of novel therapeutic strategies. The collaborative efforts of TransCure combine a unique interdisciplinary skill set to be applied to the developing therapeutic strategies by controlling the function of strategically important transporters in the diseased states. The skillset encompasses three major disciplines, referred to as “TransCure Trias”: Physiology/Medicine, Structural Biology and Medicinal Chemistry. TransCure members and programs are localized in many institutions across Switzerland and the TransCure approach is designed to facilitate collaboration and coordination of activities with an entrepreneurial spirit. The outcome of the NCCR TransCure project is expected to help develop strategies to improve human health.

c) *Conference organization*

Matthias Hediger has established two different international conference series to promote the transporter/ion channel field in the biomedical and pharmaceutical areas:

- 1) International Gordon Research Conference Series on transporters and channels

2) International BioMedical Transporter Conference Series (held every two years) on the pharmaceutical aspects of transporters and channels. The aim is to promote the membrane transporter field, and to review the physiological, pathological and pharmaceutical implications of transporter proteins and ion channels. The focus is on transporter and ion channel-based drug discovery strategies, pharmacokinetics, drug delivery and drug elimination (<http://www.bioparadigms.org/conference/index.htm>).

d) SLC mini-review series and BioParadigms website

There are currently 52 human transporter gene families belonging to the SLC (solute carrier) series and these families include 395 genes. The SLC tables, originally prepared by the authors of the SLC special issue in the European Journal of Physiology for 42 families, provide the latest updates on these families and their genes, as well as relevant links to gene databases and references. These tables are located on the website of BioParadigms (<http://www.bioparadigms.org/slc/intro.htm>), an online scientific resource established by Matthias Hediger in 2004 to facilitate global interaction and information exchange between membrane biologists in academia and industry. Early in 2013, Matthias A. Hediger released as guest editor another series of the currently 52 SLC families in Molecular Aspects of Medicine (Elsevier Ltd.), the special issue being entitled: “The ABC of membrane transporters in health and disease (SLC series)”. Currently, Matthias Hediger serves as Special Advisor on solute carriers to the HUGO Gene Nomenclature Committee (HGNC).