

第40回生理学研究所国際シンポジウム

「合同国際シンポジウム：アニオン輸送生理学と細胞容積調節 (PAT-CVR)」

今回のシンポジウムは、今これまで世界各国で別々に開かれていた International Symposium for Cell Volume Regulation (CVR: 細胞容積調節国際シンポジウム) と International Symposium for Physiology of Anion Transport (PAT: 陰イオン輸送国際シンポジウム) を、第40回生理学研究所国際シンポジウムとして岡崎で合同開催した。オーガナイザーは岡田泰伸 (生理研)、鍋倉淳一 (生理研)、富永真琴 (生理研・統合バイオ)、相馬義郎 (慶応大)、内田信一 (東医歯大)、福田敦夫 (浜松医大)、酒井秀紀 (富山大) の7名であり、最終的な参加人数は207名で、そのうち91名が海外21カ国からの外国人研究者という盛大な国際シンポジウムとなった。本シンポジウムでは、1. PATおよびCVR分野で最も重要かつ最近急速な展開がみられた共通課題に関して、著名研究者による特別講演7題 (海外5名、国内2名)、2. PATおよびCVR研究で最先端の各6つの領域に関して4-6名によるセッション (60題)、3. 若手研究者による討論重視のポスター発表 (37題) を実施し、活発な討議を行った。具体的には、特別講演として岡田泰伸所長の他に、Kai Kaila 先生、富永真琴先生、Else K Hoffmann 先生、Thomas J Jentsch 先生、John R Riordan 先生、Bernd Nilius 先生にそれぞれの専門分野に関して最新の知見を講演していただいた。また PAT シンポジウムでは、1. CFTR: 分子構造から細胞生理学および嚢胞性繊維症治療へ、2. CLC クロライドチャンネル、3. リガンド作動性アニオンチャンネル、4. クロライドチャンネル研究の新展開、5. SLC と有機アニオントランスポーター、6. アニオンチャンネルとトランスポーターの分子相関と分子進化と題した6セッションを、CVR シンポジウムでは、1. 細胞容積調節とアニオンチャンネル/トランスポーター、2. 細胞容積調節とカチオンチャンネル/トランスポーター、3. 細胞容積調節と有機溶質輸送、4. 細胞容積調節と細胞内シグナル、5. 細胞容積調節と細胞機能、6. 細胞容積調節と細胞死と題した6セッションを実施した。これらの各講演では、最新の大変興味深い知見が発表され、討論が活発になされた。さらには合同ポスター発表においても、討論時間が3日間で約4時間と長めであったことから、活発な議論が交わされ、若手研究者同士の交流もはかることが出来た。

これまでに別々に行われていた PAT シンポジウムと CVR シンポジウムであったが、その研究領域の共通性から発案された今回の合同開催は大成功に終わった。両シンポジウムを合同開催することで、比較的近い領域の国際的な研究者が一堂に会し、討論することが可能となったため、これまでの視野をさらに広げることが出来たことが大きなメリットであった。



The 40th NIPS International Symposium:
**International Joint Symposium:
Physiology of Anion Transport and Cell Volume Regulation (PAT-CVR)**

August 3-6, 2009

National Institutes for Physiological Sciences
Okazaki Conference Center, Okazaki, Japan
< <http://www.nips.ac.jp/patcvr/index.html> >

August 3

Registration & Get-Together

August 4

Opening Remark

Yasunobu Okada Director-General of NIPS

PAT-CVR Lectures

1. Yasunobu Okada (NIPS, Japan) Chairperson: Else K Hoffmann
Roles of anion channels and disordered cell volume regulation in apoptotic and necrotic cell death
2. Kai Kaila (Univ. Helsinki, Finland) Chairperson: Junichi Nabekura
Neuronal chloride regulation and epilepsy

PAT Symposium

PAT-I: CFTR: From Molecular Structure to Tissue Physiology and Therapy for CF

Chaired by David N Sheppard and Yoshiro Soma

3. Paul M. Quinton (University of California, USA)
Does Mucus need HCO_3^- ?
4. Christine E Bear (SickKids Hospital, Canada)
Biochemical studies of the enzymatic activity of full length CFTR and catalytic site mutants
5. David N Sheppard (University of Bristol, UK)
Direct sensing of intracellular pH by the CFTR Cl^- channel
6. Hsiao Chang Chan (The Chinese University of Hong Kong, Hong Kong)
Involvement of CFTR in oviductal bicarbonate transport and embryo development
7. John W Hanrahan (McGill Univ., Canada)
Enhanced calcium entry in cells that express ΔF508 CFTR: crosstalk between mature CFTR, ORAI1, and the ER-resident protein STIM1

PAT-II: CLC Chloride Channel

Chaired by Shinichi Uchida and Thomas Jentsch

8. Thomas J Jentsch (FMP and MDC, Germany)
ClCK/barttin Cl^- channels—role in the kidney and the inner ear
9. Francisco V Sepúlveda (CECS and CIN, Chile)
Titration of specific residues account for complex gating of a ClC chloride channel by extracellular protons
10. Alessio Accardi (University of Iowa, USA)
Anion binding and selectivity in the CLC family of channels and transporters

11. Shinichi Uchida (Tokyo Medical and Dental University, Japan)

Molecular pathogenesis of Bartter syndrome caused by R8L barttin mutation

12. Jorge Arreola (University of San Luis Potosi, Mexico)

Proton and chloride ions alter ClC-2 gating by interfering with closing of protopore gate

PAT-III: Ligand-gated Anion Channel

Chaired by Junichi Nabekura and Atsuo Fukuda

13. Andrew J Moorhouse (The University of New South Wales, Australia)

Molecular determinants and biophysical mechanisms of anion selectivity in glycine receptor-channels

14. Heiko J Luhmann (Johannes Gutenberg University, Germany)

Function of ligand-gated chloride channels in the newborn rodent cerebral cortex

15. Claudio Rivera (University of Helsinki, Helsinki, Finland)

Mechanisms of KCC2 gene regulation in immature neurons

16. Rustem Khazipov (INMED-INSERM U901, France)

Actions of GABA on the immature cortical neurons in vitro and in vivo

17. Atsuo Fukuda (Hamamatsu University School of Medicine, Japan)

Endogenous taurine tonically activates GABA_A receptors in embryonic mouse neocortex

CVR Symposium

CVR-I: CVR & Anion Channel/Transporter

Chaired by Andrés Stutzin and Hideki Sakai

18. Clive M Baumgarten (Virginia Commonwealth University, USA)

Reactive oxygen species produced by NADPH oxidase and mitochondria regulate volume-sensitive Cl⁻ channels: A common theme for multiple pathways

19. Joseph R Hume (University of Nevada School of Medicine, USA)

Cardiac-specific manipulation of ClC-3 gene alters native volume-sensitive outwardly rectifying anion channels (VSOACs) and heart function in transgenic mice

20. Takahiro Shimizu (Toyama University, Japan)

Volume-sensitive Cl⁻ channel as a regulator of acquired cisplatin resistance

21. Shintaro Yamamoto (Fukuoka University, Japan)

Cell-volume regulation in mammalian heart

22. Diego Varela (Universidad de Chile, Chile)

Calcium entry modulates the time course for VSOR Cl⁻ current onset in rat hepatoma cells

CVR-II: CVR & Cation Channel/Transporters

Chaired by Frank Wehner and Francisco J Alvarez-Leefmans

23. Frank Wehner (Max-Planck-Institute of Molecular Physiology, Germany)

The hypertonicity-induced cation channel (HICC) in human hepatocytes: Role in proliferation vs. apoptosis and molecular characterization

24. Francisco Javier Alvarez-Leefmans (Wright State University, USA)

Role of NKCC1 in isosmotic volume control studied in rodent dorsal root ganglion neurons

25. Rainer Hedrich (University of Würzburg, Germany)

Guard cell volume is controlled by anion channels via draught stress signaling kinase and phosphatase

26. Miguel A Valverde (University Pompeu Fabra, Spain)

Regulation and pathophysiological relevance of the TRPV4 channel

27. Dandan Sun (Univ. of Wisconsin School of Medicine and Public Health, USA)

ER Ca^{2+} dysregulation and ER stress following in vitro neuronal ischemia: role of Na^+ - K^+ - Cl^- cotransporter

CVR-III: CVR & Organic Solute Transport

Chaired by Alexander A Mongin and Ravshan Z. Sabirov

28. Kishio Furuya (Nagoya University, Japan)

ATP-releases via multiple pathways in mammary epithelial cells revealed by ATP imaging

29. Ryszard Grygorczy (University of Montreal, Canada)

Volume-sensitive nucleotide release from epithelial cells

30. Alexander A Mongin (Albany Medical College, USA)

Redox-regulation of volume-sensitive organic osmolyte release in the brain: mechanisms and (patho) physiological significance

31. Harold K Kimelberg (Ordway Research Institute, USA)

Pros and cons of glutamate transport through cell volume regulated (CVR) anion channels in astrocytes: are there therapeutic implications?"

32. Ravshan Z Sabirov (Institute of Physiology and Biophysics, Uzb. Acad. Sci., Uzbekistan)

Transport of organic solutes through the maxi-anion channel

August 5

PAT-CVR Lectures

33. Makoto Tominaga (NIPS, Japan) Chairperson: Bernd Nilius

Physiological significance of the thermosensitive TRP channels

34. Else K Hoffmann (University of Copenhagen, Denmark) Chairperson: Hideki Sakai

Regulation of cell volume, proliferation and programmed cell death: Role of ion channels and aquaporins

35. Thomas J Jentsch (FMP and MDC, Germany) Chairperson: Shinichi Uchida

CLC Cl channels and transporters—biophysics, physiology and pathology

August 6

PAT-CVR Lectures

36. John R Riordan (University of North Carolina, USA) Chairperson: Yoshiro Sohma

“CFTR at 20: evolving perspectives

37. Bernd Nilius (Katholieke Universiteit Leuven, Belgium) Chairperson: Makoto Tominaga

Mechano-sensitive TRP channels: facts and fictions

PAT Symposium

PAT-IV: New Directions in Cl^- Channel Research

Chaired by Michael A Gray and Criss Hartzell

38. J Kevin Foskett (University of Pennsylvania, USA)

Molecular mechanisms of cholinergic- and VIP-stimulated Ca^{2+} -dependent fluid secretion by porcine lung submucosal gland serous cells

39. Nael A McCarty (Emory University, USA)

Novel peptide toxin inhibitors of the CFTR and ClC-2 chloride channels

40. Criss Hartzell (Emory University School of Medicine, USA)

Bestrophins and Anoctamins as Molecular Candidates for Ca^{2+} -activated Cl Channels

41. Luis JV Galiotta (Gaslini Institute, Italy)

Functional and molecular analysis of TMEM16 proteins as plasma membrane chloride channels

42. Rebecca A Falin (Vanderbilt University Medical Center, USA)

Identification of Ste20 kinase regulatory phosphorylation sites in a cell cycle and cell volume sensitive Cl⁻ anion channel

PAT-V: SLC & Organic Anion Transporters

Chaired by Hiroshi Ishiguro and Seth L. Alper

43. Min Goo LEE (Yonsei University College of Medicine, Korea)

Regulation of CFTR and SLC26 transporters by [Cl⁻]_i-sensitive protein kinases

44. Yoshikatsu Kanai (Osaka University, Japan)

Novel organic anion transporters and new aspects of organic anion transport in renal proximal tubules

45. Seth L Alper (Harvard Medical School, USA)

SLC4 and SLC26 anion transporters in flux

46. Joseph Casey (University of Alberta, Canada)

An update on Bicarbonate Transport Metabolons

47. Hiroshi Ishiguro (Nagoya University Graduate School of Medicine, Japan)

Functional interaction between SLC26A6 Cl⁻-HCO₃⁻ exchange and CFTR in pancreatic ducts

48. Shigeru BH Ko (Nagoya University Graduate School of Medicine, Japan)

Pancreatic ductal HCO₃⁻ secretion in a disease-implication for the role of ion channels and transporters

PAT-VI: Molecular Relation between Anion Channel and Transporter: Evolutional Insight of Anion Channel/Transporter Molecules

Chaired by Tzyh-Chang Hwang and Tsung-Yu Chen

49. Merritt C Maduke (Stanford University School of Medicine, USA)

Substrate-driven conformational changes in ClC-ec1 observed by fluorine NMR

50. David C Gadsby (Rockefeller University, USA)

Controlling the gates of CFTR, a chloride channel evolved from an ABC transporter

51. Tzyh-Chang Hwang (University of Missouri-Columbia, USA)

Kinetic role of CFTR's first nucleotide binding domain and its pharmacological implications

52. Joseph A Mindell (National Institute of Neurological Disorders and Stroke, NIH, USA)

Ins and outs of the lysosomal chloride conductance: biophysics and biology of an organellar anion transporter

53. Uhtaek Oh (Seoul National University, Korea)

Anoctamin-1, a cloned Ca²⁺-activated chloride channel and its physiological implication

CVR Symposium

CVR-IV: CVR & Cell Signals 10:00-12:30

Chaired by Stine Falsig Pedersen and Yoshinori Marunaka

54. Ben CTilly (Erasmus University Medical Center, The Netherlands)

Cell volume regulation in intestinal epithelial cells: a role for chloride channel recruitment?

55. Stine Falsig Pedersen (University of Copenhagen, Denmark)

Osmotic shrinkage regulates p90^{RSK}, Msk1, and transcription factors CREB and SRF: effectors in shrinkage-induced modulation of death/survival balance?

56. Naomi Niisato (Kyoto Prefectural University of Medicine, Japan)

Dephosphorylation of ERK by MKP-1 stimulates beta- and gamma-ENaC mRNA expression of renal A6 cells in hypotonic stress

57. Ian Henry Lambert (University of Copenhagen, Denmark)

Reactive oxygen species modulate the taurine homeostasis in NIH3T3 mouse fibroblasts

58. Hideki Sakai (University of Toyama, Japan)

Osmotic regulation of cell differentiation via aquaporin-5 in human gastric cancer

CVR-V: CVR & Cell Functions

Chaired by Markus Ritter and Vladimir Strbak

59. Anke Fabian (University of Muenster, Germany)

Do TRPC1 channels modulate mechanosensitive signalling during cell migration?

60. Markus Ritter (Paracelsus Medical University, Austria)

The functional role of the non-gastric H⁺/K⁺-ATPase ATP12A (ATP1AL1) as anti-apoptotic ion transporter

61. Ursula Seidler (Hannover Medical School, Germany)

Coupling of nutrient and electrolyte transporters in the small intestine

62. Vladimir Strbak (Slovak Medical University, Slovakia)

Cell swelling-induced peptide secretion; possible pathophysiological implications

CVR-VI: CVR & Cell Death

Chaired by Florian Lang and John A Cidlowski

63. Florian Lang (Eberhard-Karls-University of Tuebingen, Germany)

The functional significance of the cell volume regulated kinase SGK1

64. Carl D Bortner (National Institute of Environmental Health Sciences, NIH, USA)

A lymphoid cell model designed to evaluate the role of RVI and RVD in apoptosis (Part A)

65. John A Cidlowski (National Institute of Environmental Health Sciences, NIH, USA)

A lymphoid cell model designed to evaluate the role of RVI and RVD in apoptosis (Part B)

66. Tomohiro Numata (Kyoto University, Japan)

Cation channel activity determines cell death in human epithelial cells

67. Sergei N Orlov (University of Montreal Hospital Research Center, Canada)

Oncosis in cardiotoxic steroids-treated cells: evidence for Na⁺,K⁺-independent α 1S-Na⁺,K⁺-ATPase- and p38-mediated signaling

Closing Remark

Junichi Nabekura (NIPS, Japan)