

Curriculum Vitae

Name: Jozsef Csicsvari
Citizenship: Hungarian
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Education:

1999 Ph.D. in Behavioral and Neural Sciences, Rutgers University, USA
Thesis title: Population patterns in hippocampal local circuits.
1993-99 Rutgers University, Newark, USA, Behavioral and Neuroscience Graduate Program.
Advisor: Prof. Gyorgy Buzsaki
1993 Diploma degree in Informatics (equivalent of M.Sc.), Technical University of
Budapest, Hungary
1988-93 Technical University of Budapest, Faculty of Electrical Engineering and Informatics,
Budapest, Hungary

Research Experience:

2011- Professor, Institute of Science and Technology, Austria=
2008- MRC Senior Scientist (tenured), MRC Anatomical Neuropharmacology Unit,
University of Oxford, UK
2003-08 MRC Senior Scientist (tenure track), MRC Anatomical Neuropharmacology Unit,
University of Oxford, UK
2001-02 Research Associate, Center for Behavioral and Molecular Neuroscience, Rutgers
University, USA
1999-01 Postdoctoral Fellow, Center for Behavioral and Molecular Neuroscience, Rutgers
University, USA
1993-99 Graduate Assistant, Center for Behavioral and Molecular Neuroscience, Rutgers
University, USA

Selected Awards and Distinctions

2010 Title of *Ad Hominem* Professor in Neuroscience at the University of Oxford

Teaching:

Postdoctoral fellows:

John Huxter 2005-2008 (currently Group Leader, Regenerative Medicine Unit, Pfizer Inc.,
Cambridge, UK)
David Dupret 2007-
Joseph O'Neill 2008-
Alice Alvernhe 2010-

DPhil (PhD) students (University of Oxford):

Alessia Manganaro 2009-
Barty Pleydell-Bouverie 2006-
Timothy Senior 2004-2008 (DPhil defended)
Kevin Allen 2004-2008 (DPhil defended)
joint supervision with Prof. N. Rawlins
Joseph O'Neill 2003-2007 (DPhil defended)

MSc Thesis (University of Oxford):

Hanne Stensland 2008

Tor Kirkesola 2008

Jagdish Patel 2005

Timothy Senior 2004

Recent lectures for students:

FHS of Medical Sciences, Neuroscience Course 2010

Neuroscience MSc course at the University of Oxford, 2009-

Karolinska Institute, Sweden, 2008

Instituto Gulbenkian de Ciencia, Lisbon, 2008

Major Professional Service Activities

2008-2010 Organising seminar series for the 'OXION' group at the University of Oxford

2008-2010 Organising Open Day for local high school students visiting the Unit

2009 Organising talk session at the Hungarian Neuroscience Meeting

2010 External PhD examiner University College London

2008, 2007 Internal DPhil examiner, University of Oxford

Reviews

2009- Review Editor, *Frontiers in Neuroengineering*

2008- Review Editor, *Frontiers in Systems Neuroscience*

Ad hoc reviewer: *Nature* 2009-, *Science* 2008, *Neuron* 2005-, *PLOS Biology* 2008-, *Nature*

Neuroscience 2010, *PNAS* 2009-, *Journal of Neuroscience* 2006-, *European Journal of*

Neuroscience 2004-, *Hippocampus* 2006-, *TINS* 2009, *Journal of Neurophysiology* 2009-, *Journal*

of Physiology 2003-, *IET Nanobiotechnology* 2008, *Sensors & Actuators: A. Physical.* 2010,

BioTechniques 2007, *IEEE Biomedical Engineering* 2005, *Journal of Neuroscience Methods* 2002-

2003, *Neuroscience Letters* 2001

Grant reviewer: MRC(UK) 2006-, BBRC(UK) 2008-, Wellcome Trust(UK) 2009-

Recent invited talks/seminars: Cajal Institute, Madrid, 2010, University College London, 2010, European Genomics & Neurodegenerative Diseases, Oxford -2010, University of Heidelberg, Challenges in Extracellular Electrophysiology workshop, Janelia Farm, Howard Hughes Medical Institute, Center for Brain Research, Vienna, 2010, Bernstein Centre for Computational Neuroscience, Berlin 2010, Japanese Neuroscience Meeting, 2009; RIKEN, 2009; National Institute for Physiological Sciences, Okazaki, 2009; University of Aberdeen, 2009; University of Bristol, 2009; NYU, 2009; Gordon Research Conference on Inhibition, 2009; UC-Irvine, 2009; Janelia Farm, Howard Hughes Medical Institute, 2009; German Neuroscience meeting, Gottingen, 2009; University of Birmingham, 2009; INMED, Marseille, 2009; French Clinical Neurophysiology Society meeting, 2009; BNA Christmas Symposium on Sleep at the; Royal Society, 2008; Charite University, Berlin, 2008; Imperial College, 2008; Gordon Research Conference on Epilepsy, 2008; Meeting on Spatiotemporal Patterns and Synfire Chains, Newcastle, 2008; University of Manchester (workshop on Local Field Potentials), 2008; University of Glasgow, 2008

Publications (*some of the significant papers highlighted in bold*):

Dupret, D., O'Neill, J., Pleydell-Bouverie, B., & Csicsvari, J. (2010) The reorganization and reactivation of hippocampal maps predict spatial memory performance. *Nature Neurosci.*, 13: 995-1002. (Discussed in the News and Views section of the journal by Jeffery and Cacucci)

Jiruska P, Csicsvari J, Powell A, Fox J, Chang W, Vreugdenhil M, Li X, Palus M, Fernandez A, Dearden R, Jefferys J

- (2010) High-frequency network activity, global increase in neuronal activity and synchrony expansion precede epileptic seizures in vitro. *J Neurosci*, 30, 5690-5701.
- Remy S, Csicsvari J, Beck H (2009) Activity-dependent control of neuronal output by local and global dendritic spike attenuation. *Neuron*, 61:906-16.
- Huxter JR, Senior TJ, Allen K, Csicsvari J (2008). Theta phase-specific codes for two-dimensional position, trajectory and heading in the hippocampus. *Nature Neurosci*. 11:587-594.**
- Senior TJ, Huxter JR, O'Neill J, Allen K, Csicsvari J (2008) Gamma Oscillatory Firing Reveals Distinct Populations of Pyramidal Cells in the CA1 Region of the Hippocampus. *J Neurosci*, 28:2274-86 (selected as *This Week in the Journal*).**
- O'Neill J, Senior TJ, Allen K, Huxter JR, Csicsvari J (2008) Reactivation of experience-dependent cell assembly patterns in the hippocampus. *Nature Neurosci*. 11:209-215. (Discussed in the News and Views section of the journal by Nitz and Coven and Journal Cover illustration).**
- Mallet N, Pogosyan A, Sharott A, Csicsvari J, Bolam JP, Brown P, Magill PJ (2008) Disrupted dopamine transmission and the emergence of exaggerated beta oscillations in subthalamic nucleus and cerebral cortex. *J. Neurosci*. 28:4795-4806.
- Fuentealba P, Begum R, Capogna M, Jinno S, Marton LF, Csicsvari J, Thomson A, Somogyi P, and Klausberger T (2008) Ivy cells: a population of nitric-oxide-producing, slow-spiking GABAergic neurons and their involvement in hippocampal network activity. *Neuron* 57:917-929.
- Csicsvari J, O'Neill J, Allen K, Senior T (2007) Place-Selective Firing Contributes to the Reverse Order Reactivation of CA1 Pyramidal Cells during Sharp Waves in Open Field Exploration. *Eur J Neurosci*, 26:704-716.**
- O'Neill J, Senior TJ, Csicsvari J (2006) Place-selective firing of CA1 pyramidal cells during sharp wave/ripple network patterns in exploratory behaviour. *Neuron* 49:143-55.**
- Magill PJ, Pogosyan A, Sharott A, Csicsvari J, Bolam JP, Brown P (2006) Changes in functional connectivity within the rat striatopallidal axis during global brain activation in vivo. *J Neurosci* 26:6318-29.
- Klausberger T, Marton LF, O'Neill J, Huck JH, Dalezios Y, Fuentealba P, Suen WY, Papp E, Kaneko T, Watanabe M, Csicsvari J, Somogyi P (2005) Complementary roles of cholecystokinin- and parvalbumin-expressing GABAergic neurons in hippocampal network oscillations. *J Neurosci* 25:9782-93.
- Csicsvari J, Henze DA, Jamieson B, Harris KD, Sirota A, Wise KD, Buzsáki G (2003) Massively-parallel recording of unit and local field potentials with silicon-based electrodes. *J Neurophysiol* 90:1314-23.**
- Harris KD, Csicsvari J, Hirase H, Dragoi G, Buzsaki G (2003) Organization of cell assemblies in the hippocampus. *Nature* 424:552-6.**
- Sirota A, Csicsvari J, Buhl D, Buzsaki G (2003) Communication between neocortex and hippocampus during sleep in rodents. *Proc Natl Acad Sci USA* 100:2065-9.
- Csicsvari J, Jamieson B, Wise K, Buzsaki G (2003) Mechanisms of gamma oscillations in the hippocampus in vivo. *Neuron* 37:311-322. (Cover illustration)**
- Buzsaki G, Buhl DL, Harris KD, Csicsvari J, Czeh B, Morozov A. (2003) Hippocampal network patterns of activity in the mouse. *Neuroscience* 116:201-11.
- Hirase H, Leinekugel X, Czurko A, Csicsvari J, Buzsaki G (2001) Firing rates of hippocampal neurons are preserved during subsequent sleep episodes and modified by novel awake experience. *Proc Natl Acad Sci U SA* 98:9386-90.
- Hirase H, Leinekugel X, Csicsvari J, Czurko A, Buzsaki G. (2001) Behavior-dependent states of the hippocampal network affect functional clustering of neurons. *J Neurosci* 21:RC145.
- Szabo I, Czurko A, Csicsvari J, Hirase H, Leinekugel X, Buzsaki G (2001) The application of printed circuit board technology for fabrication of multi-channel micro-drives. *J Neurosci Methods* 105:105-110.
- Csicsvari J, Hirase H, Mamiya A, Buzsaki G (2000) Ensemble patterns of hippocampal CA3-CA1 neurons**

during sharp wave associated population events. *Neuron* 28:585-594.

Henze DA, Borhegyi Z, **Csicsvari J**, Mamiya A, Harris KD, Buzsaki G (2000) Intracellular features predicted by extracellular recordings in the hippocampus in vivo. *J Neurophysiol* 84:390-400.

Harris KD, Henze DA, **Csicsvari J**, Hirase H, Buzsaki G (2000) Accuracy of tetrode spike separation as determined by simultaneous intracellular and extracellular measurements. *J Neurophysiol* 84:401-14.

Csicsvari J, Hirase H, Czurko A, Mamiya A, Buzsaki G (1999) Fast network oscillations in the hippocampal CA1 region of the behaving rat. *J Neurosci* 19:RC20 1-4.

Csicsvari J, Hirase H, Czurko A, Mamiya A, Buzsaki G (1999) Oscillatory coupling of hippocampal pyramidal cells and interneurons in the behaving rat. *J Neurosci* 19:274-287.

Hirase H, Czurko A, **Csicsvari J**, Buzsaki G (1999) Firing rate and theta-phase coding by hippocampal pyramidal neurons during 'space clamping'. *Eur J Neurosci* 11:4373-80.

Penttonen M, Nurminen N, Miettinen R, Sirvio J, Henze DA, **Csicsvari J**, Buzsaki G (1999) Ultra-slow oscillation (0.025 Hz) triggers hippocampal afterdischarges in Wistar rats. *Neuroscience* 94:735-43.

Nadasdy Z, Hirase H, Czurko A, **Csicsvari J**, Buzsaki G (1999) Replay and time compression of recurring spike sequences in the hippocampus. *J Neurosci* 9:9497-507.

Dragoi G, Carpi D, Recce M, **Csicsvari J**, and Buzsaki Gy (1999) Hippocampomedial Septal Interactions during Sharp Waves and Theta Oscillation in the Behaving Rat. *J Neurosci* 19:6191-9.

Czurko A, Hirase H, **Csicsvari J**, Buzsaki G (1999) Sustained activation of hippocampal pyramidal cells by space clamping in a running wheel. *Eur J Neurosci* 11:344-52.

Csicsvari J, Hirase H, Czurko A, Buzsaki G (1998) Reliability and state-dependence of pyramidal cell-interneuron synapses in the hippocampus: an ensemble approach in the behaving rat. *Neuron* 21: 179-189.

Bragin A, **Csicsvari J**, Penttonen M, Buzsaki G, (1997) Epileptic afterdischarge in the hippocampal-entorhinal system: current source density and unit studies. *Neuroscience* 76:1187-203.

Reviews, book chapters, commentaries

Dupret D, Pleydell-Bouverie B, Csicsvari J (2010), Rate Remapping: When the Code Goes beyond Space, *Neuron*, doi:10.1016/j.neuron.2010.12.011

O'Neill, J, Pleydell-Bouverie B, Dupret D, Csicsvari J, (2010) Play it again: reactivation of waking experience and memory. *TINS*, 33 220-229.

Dupret D, Pleydell-Bouverie B, **Csicsvari J** (2008) Inhibitory interneurons and network oscillations. *PNAS*: 105:18079-80.

Buzsaki G, **Csicsvari J**, Dragoi G, Harris K, Henze D, Hirase H (2002) Homeostatic maintenance of neuronal excitability by burst discharges in vivo. *Cereb Cortex* 12:893-9.

Nadasdy Z, **Csicsvari J**, Penttonen M, Hetke J, Wise K, Buzsaki, G (1998) Extracellular recording and analysis of neuronal activity: from single cells to ensembles. In: Eichenbaum, H. and Davis, J. (Ed.): Large scale recording of neuronal activity. Wiley, New York.