Profesor Attila Sik

Professor of Cellular Neuroscience

Neurobiology

Contact details

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About

Attila Sik (pronounced “sheek”) is professor of cellular neurophysiology. He published several book chapters and ~50 research articles in scientific journals. His research papers have been cited over 3000 times. He has received major national grants in Hungary, Canada (Canada Foundation for Innovation, Canadian Institutes of Health Research), UK (Medical Research Council) and international grant form Human Frontiers Science Program.

Qualifications

- PhD (summa cum laude) Neuroscience 1997
- MSc Biology and Chemistry 1991

Biography

Attila Sik received his MSc in Biology and Chemistry field from the Kossuth University, Debrecen, Hungary in 1991. He later worked in the Institute of Experimental Medicine, Hungarian Academy of Sciences in Budapest, Hungary, before he moved to the USA where he worked as a research fellow for almost 4 years at Rutgers University, New Jersey. Upon his return to Hungary in 1996 he received a PhD from Semmelweis Medical School with summa cum laude in the field of Neuroscience.

He is an independent researcher since 2000 when he established his first laboratory at Laval University, Quebec, Canada. He is also an associate professor at McGill University, Montreal, Canada, and guest professor at Yanshan University, China.

He uses numerous classical and innovative techniques to unveil how neurons are connected and function together. He helped to develop instruments and beta tester for various scientific companies. He also studied genetic engineering in Germany, cryo-electon microscopy in the US and the Netherlands, electron tomography in the USA, 3D reconstruction of molecules in the UK and multiphysics modelling in Canada. His main interest is in the hippocampus and epilepsy but also published several articles and still studies other brain regions which are involved in diverse neurological disease for example Parkinson’s disease or schizophrenia.

He now also studies at Warwick Business School to receive an MBA degree in 2012 focusing mainly on leadership and organizations behaviour.

Teaching

Lectures and seminars for PhD students

Postgraduate supervision

Supervision of PhD students and postdoctoral fellows

Research

Using oxygen probes and multichannel recording method Professor Sik investigates the changes of cortical network oscillations in altered oxygen concentrations in vitro and in vivo, the underlying cellular mechanisms and the effect of altered oxygen on working memory.

Using similar techniques he also investigates the relationship between network activity and NO and pH fluctuations.

Using Cl-sensitive probes he investigates the activity-dependent Cl- redistribution mechanism in the hippocampus.

Professor Sik studies the mechanism of the antiepileptic effect of gap junction blockers using transgenic animals, viral methods and multichannel recording.

He investigates the role of long-range inhibitory neurons in hippocampal network oscillations. He studies the neuroanatomical characteristics of long-projection neurons, the electrophysiological nature of these cells in vivo and the effect of elimination of these neurons in network synchronization.

Using optogenetic he studies the modulatory effect of dopamine on cortical oscillations.

Professor Sik studies cortical network connections using a novel virus tract-tracing method.

Other activities

Editor-in-Chief: Open Access Neuroscience London

Editor: Brain Structure and Function

Guest Editor: Information Fusion in Neuronal Signal Processing

Ad hoc referee for the following journals:

- Biological Cybernetics
- Brain Research Bulletin
- Brain Structure and Function
- Cerebral Cortex
- European Journal of Neuroscience
- Hippocampus
- International Neurochemistry
- Journal of Chemical Neuroanatomy
- Journal of Neuroscience Methods
- Neuroscience
- Proceedings of National Academy of Sciences
- PloS One

Committee member/reviewer:

- Canadian Institutes of Health Research (postdoctoral fellowship, operating grant)
- Human Frontiers Science Program (postdoctoral fellowship)
- Natural Sciences and Engineering Research Council of Canada
- Centre de Recherche sur le cerveau, le comportement et la neuropsychiatrie (postdoctoral fellowship)
- Epilepsy UK

Memberships:

- 1997- Society for Neuroscience
- 2002- Microscopy Society of America
- 2007- American Physiological Society
- 2011- British Neuroscience Association
- 2011- The physiological Society, UK

Committee and Council membership:

- British Neuroscience Association, National Committee, Publications Secretary (2011-)
- British Neuroscience Association, Treasurer (Council member, Trustee) (2014-)
- Publication Integrity an Ethics, Founding council member, (2013-)

Publications

- Kovács K, Basu K, Rouiller I and Sík A (2013) Regional differences in the expression of K+-Cl– 2 cotransporter in the developing rat neocortex, *Brain structure and function* [Epub ahead of print]
- Gharanei S, Zatyka M, Astuti D, Fenton J, Rabai EM, Sík A, Nagy Z and Barrett TG (2013) Vacuolar-type H+-ATPase V1A subunit is a molecular partner of Wolfram syndrome 1 (WFS1) protein, which regulates its stability and expression. *Human Molecular Genetics* 22(2):203-17
- Dhillon SS, Doro E, Magyary I, Eggington S, Sík A and Müller F (2013) Optimisation of embryonic and larval ECG measurement in zebrafish for quantifying the effect of QT prolonging drugs. *Plos One* 8(4):e60552
- Shinohara Y, Hosoya A, Yahagi K, Ferecskó AS, Yaguchi K, Sík A, Itakura M, Takahashi M and Hirase H (2012) Hippocampal CA3 and CA2 have distinct bilateral innervation patterns to CA1 in rodents *EJ Neurosci* 35(5):702-10
- Blanch R, Ahmed Z, Sík A, Snead D, Good P, Berry M, Scott R and Logan A (2012) Neuroretinal cell death in a murine model of closed globe injury; pathological and functional characterization. *Investigative Ophthalmology & Visual Science* 53(11):7220-6