

# Curriculum Vitae

## RAUL CRISTIAN MUREȘAN

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**Date and place of birth:** August 23<sup>rd</sup> 1978, Cluj-Napoca, Romania

### Education

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| 2006 – 2008 | Postdoc at Frankfurt Institute for Advanced Studies (FIAS – Neuroscience department) and Max Planck Institute for Brain Research (MPI – Neurophysiology department), Frankfurt am Main, Germany. |
| 2004 – 2005 | Visiting PhD student at FIAS and MPI, Frankfurt am Main, Germany.  |
| 2002 – 2005 | PhD from Technical University of Cluj-Napoca, in collaboration with FIAS and MPI.  |
| 1997 – 2002 | Diplomat engineer degree from Technical University of Cluj-Napoca with a degree exam mark of 10 out of 10.   |

### Professional experience

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| Since 2017        | President of the Transylvanian Institute of Neuroscience and director of the Experimental and Theoretical Neuroscience Department, Cluj-Napoca, Romania   |
| Since 2015        | Founder and CEO of Neurodynamics SRL  |
| 2007 – 2017       | Principal Investigator – Experimental and Theoretical Neuroscience Laboratory at the Center for Cognitive and Neural Studies (Coneural), Romanian Institute of Science and Technology, Cluj-Napoca, Romania |
| Since 2012        | Organizer of the Transylvanian Experimental Neuroscience Summer School (TENSS – <a href="http://www.tenss.ro">www.tenss.ro</a> )  |
| 2008 – 2013       | Head of a Max Planck Partner Group in Romania during 2008-2013: <a href="http://www.mpg.de/272644/Partner_Groups">http://www.mpg.de/272644/Partner_Groups</a>   |
| 2011 – 2013, 2017 | Member of Biology Committee of the National Research Council of Romania (CNCS)  |

2002 – 2004 Head of research group in applied Neuroscience at S.C. Nivis S.R.L. during 2002-2004

## **Reviewer, evaluator**

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Reviewer Cellular and Molecular Life Sciences, Addition Biology, Frontiers Neuroscience, Frontiers in Human Neuroscience, Neuroscience, Journal of Neurophysiology, Neural Computation, Neural Networks, IEEE Transactions on Neural Networks, International Journal of Information Fusion, ICANN: 2005-2008, CNS Meeting: 2012-Present, IFAC World Conference

Evaluator National Research Council of Romania, Estonian Science Foundation, FIAS Summer School on Theoretical Neuroscience and Complex Systems, Transylvanian Experimental Neuroscience Summer School, Fullbright etc.

## **Grants**

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### **Research grants**

2007 – 2009 Reintegration Grant funded by the Romanian Government. Title: "Dynamics of Cortical Microcircuits: Oscillations, Resonance, Synchronization". Amount: ~119,000 euro. Project ID: RP5/2007, Contract No. 1/2007.

2007 – 2010 Ideas Grant funded by the Romanian Government. Title: "Complexity of Cortical Dynamics During Perceptual Binding: Gamma Oscillations". Amount: ~196,000 euro. Project ID: ID48/2007, Contract No. 204/2007.

2008 – 2013 Coneural – Max Planck Partner Group, funded by the Max Planck Society from Germany. Amount: 20,000 euro/year for 5 years. Purpose: to strengthen collaboration of the PI's lab with the Max Planck Institute for Brain Research in Frankfurt am Main.

2010 – 2013 Human Resources Grant, funded by the Romanian Government. Title: "Object Recognition via Attractors in the Human Brain". Amount: ~175,000 euro. Project ID: TE11/2010, Contract No. 23/28.07.2010.

2011 – 2013 Mentor for two post-doc grants won by Dr. Moca Vasile Vlad and Dr. Țincaș Ioana, for the period 2011-2013. Each grant is in amount of: ~70,000 euro.

2014 – 2016 Grant funded by the Volkswagen Foundation. Title: "Investigation of cortical circuit dynamics: trajectories, complexity, chaos, oscillation mechanisms". Amount: 50,000 euro.

- 2015 – 2017 Human Resources Grant, funded by the Romanian Government. Title: "Mechanisms of gamma oscillations in cortical networks: from emergence to functional role in perception and cognition". Amount: ~124,000 euro.
- 2016 – 2017 Support Grant, funded by the Romanian Government. Award for participating in H2020 projects. Amount: ~31,500 euro.
- 2016 – 2019 H2020-PHC-2015-two-stage grant, funded by the European Commission. Title: "Systems Biology of Alcohol Addiction: Modeling and validating disease state networks in human and animal brains for understanding pathophysiology, predicting outcomes and improving therapy". Amount: 414,125 euro.
- 2016 – 2019 Associate partner in the INTERLEARN H2020 Marie Skłodowska-Curie ITN for a European Industrial Doctorate programme led by Birkbeck College, University of London.
- 2017 – 2021 IOS grant funded by the National Science Foundation from USA. Title: "A framework for analyzing converging feedforward and cortical-bulbar feedback dynamics in target detection from complex odor scenes". Project ID: NSF16-505. Amount: 140.800 USD.
- 2017 – 2019 Ideas grant, type PCE funded by the Romanian Government. Title: "Action planning and execution across fronto-parietal neural ensembles". Project ID: PN-III-P4-ID-PCE-2016-0010. Amount: 849.990 RON.
- 2017 – 2018 Experimental-demonstrator grant, type PED funded by the Romanian Government. Title: "High-bandwidth brain-computer interface demonstrator". Project ID: PN-III-P2-2.1-PED-2016-0007. Amount: 475.000 RON.
- 2018 – 2021 Era-Net NEURON grant. Title: "Understanding psychosis, cognitive impairment and motor symptoms induced by NMDA receptor dysfunction: from mechanisms to prevention and therapy". Project ID: COFUND-NEURON-NMDAR-PSY. Amount: 910.000 RON.

### **Grants funding the Transylvanian Experimental Neuroscience Summer School**

#### **(TENSS)**

- 2011 School of Advanced Studies Grant, funded by the Romanian Government. Title: "First Transylvanian Summer School on Experimental Systems Neuroscience". Amount: ~19,000 euro. Funding for TENSS 2012.

2012	Hertie Alumni Grant, funded by the Hertie Foundation in Germany. Amount: 3,000 euro. Funding for TENSS 2012.
2012	European Neuroscience Schools Program grant for TENSS 2013, funded by FENS-IBRO in amount of 20,000 euro.
2012	Office of Naval Research Global (ONRG) grant in amount of 19,900 US dollars. Funding for TENSS 2013.
2012	School of Advanced Studies Grant, funded by the Romanian Government. Amount: ~18,500 euro. Funding for TENSS 2013.
2013	Hertie Alumni Grant, funded by the Hertie Foundation in Germany. Amount: 3,000 euro. Funding for TENSS 2013.
2013	Training Centre grant funded by FENS-IBRO in amount of 40,000 euro. Funding for TENSS 2014.
2015	Gatsby & Wellcome Trust grant for TENSS 2015 in amount of 50,000 euro.
2015	FENS, IBRO, The Company of Biologists, and EBBS funding for TENSS 2015 in total amount of ~15,000 euro.
2016	Gatsby & Wellcome Trust grant for TENSS 2016 in amount of 50,000 euro.
2016	Grants from PERC, FENS-NENS, The Company of Biologists, Simons Foundation for TENSS 2016 in amount of ~75,000 EUR
2017	Grants from PERC, FENS-NENS, The Company of Biologists, Simons Foundation, Botnar Foundation for TENSS 2017 in amount of ~74,000 EUR
2018	Grants from PERC, FENS-NENS, The Company of Biologists, Simons Foundation, Botnar Foundation for TENSS 2018 in amount of ~80,000 EUR

## **Selected publications**

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Moca V.V., Nagy-Dăbâcan A., Bârzan H., **Mureşan R.C.\*** (2019), Superlets: time-frequency super-resolution using wavelet sets. *BioRxiv* 583732; doi:10.1101/583732

Jurjuţ O.F., Gheorghiu M., Singer W., Nikolić D., **Mureşan R.C.\*** (2019), Hold Your Methods! How Multineuronal Firing Ensembles Can Be Studied Using Classical Spike-Train Analysis Techniques, *Frontiers in Systems Neuroscience* 13:21, fnsys.2019.00021.

de Calbiac H., Dăbâcan A., Marsan E., Tostivint H., Devienne G., Ishida S., Leguern E., Baulac S., **Mureșan R.C.**, Kabashi E., Ciura S. (2018), Depdc5 knockdown causes mTOR-dependent motor hyperactivity in zebrafish. *Annals of Clinical and Translational Neurology*, 5(5):510-523.

Dolean S., Dînșoreanu M., **Mureșan R.C.**, Geiszt A., Potolea R., Țincaș I. (2018), A Scaled-Correlation Based Approach for Defining and Analyzing Functional Networks. In: Appice A., et al. (eds) NFMCP 2017. *Lecture Notes in Computer Science*, vol. 10785, Springer.

Nedelcu E., Portase R., Tolas R., **Mureșan R.C.**, Dinsoreanu M., Potolea R. (2017), Artifact detection in EEG using machine learning. *Intelligent Computer Communication and Processing (ICCP)*, 13th IEEE International Conference on, pp. 77-83.

Ciuparu A. and **Mureșan R.C.\*** (2016), Sources of bias in single-trial normalization procedures. *European Journal of Neuroscience* 43(7):861–869.

Moca V.V., Nikolić D., Singer W., **Mureșan R.C.\*** (2014), Membrane Resonance Enables Stable and Robust Gamma Oscillations. *Cerebral Cortex* 24:119-142.

Nikolić D., **Mureșan R.C.**, Feng W., Singer W. (2012) Scaled correlation analysis: a better way to compute a cross-correlogram. *European Journal of Neuroscience* 35(5), 742-762.

Jurjuț O.F., Nikolić D., Singer W., Yu S., Havenith M.S., **Mureșan R.C.\*** (2011), Timescales of Multineuronal Activity Patterns Reflect Temporal Structure of Visual Stimuli. *PLoS One* 6(2): e16758.

Moca V.V., Țincaș I., Melloni L., **Mureșan R.C.\*** (2011), Visual exploration and object recognition by lattice deformation. *PLoS One* 6(7): e22831.

Jurjuț O.F., Nikolić D., Pipa G., Singer W., Metzler D., **Mureșan R.C.\*** (2009), A color-based visualization technique for multi-electrode spike trains. *J Neurophysiol* 102:3766-78.

Moca V.V., Scheller B., **Mureșan R.C.**, Dauser M., Pipa G. (2009), EEG under anesthesia - feature extraction with TESPAN. *Computer Methods and Programs in Biomedicine* 95:191-202.

**Mureșan R.C.\***, Jurjuț O.F., Moca V.V., Singer W., Nikolić D. (2008), The Oscillation Score: An Efficient Method for Estimating Oscillation Strength in Neuronal Activity. *J Neurophysiol* 99:1333-53.

Nikolić D., Moca V.V., Singer W. and **Mureșan R.C.** (2008), Properties of multivariate data investigated by fractal dimensionality. *Journal of Neuroscience Methods* 172(1):27-33.

**Mureșan R.C.\***, Savin C. (2007), Resonance or Integration? Self-sustained Dynamics and Excitability of Neural Microcircuits. *J Neurophysiol* 97:1911-1930.

**Mureșan R.C.\*** (2003) Pattern recognition using Pulse-Coupled Neural Networks and Discrete Fourier Transforms. *Neurocomputing* 51, 487-493.

\* Corresponding author

**The complete list of publications is available at:**

<http://muresanlab.tins.ro/publications/index.php>

**Google scholar profile:** <http://scholar.google.com/citations?user=97ZOGx0AAAAJ&hl=en>