**Nikolaos Karalis**

Friedrich Miescher Institute for Biomedical Research Website www.nikolaskaralis.gr

Maulbeerstrasse 66 Email nikolaskaralis@gmail.com

4058, Basel, Switzerland Tel. +41 779 656 702

**Current position**

**Research fellow**

2018 - now Friedrich Miescher Institute for Biomedical Research

Group leader: Dr. Andreas Lüthi

**Education**

**Ph.D. candidate in Neuroscience**

2013 - 2018 Faculty of Medicine, Ludwig-Maximilians University Munich

Thesis Oscillatory architecture of memory circuits

Advisor Prof. Dr. Anton Sirota

**M.Sc. Neurasmus Joint Master in Neuroscience**

2011-2012 Charité University Medicine, Berlin – Medical Neuroscience

2012-2013 University Bordeaux II – Neuroscience and Neuropsychopharmacology Grade 18/20

Thesis Neuronal signatures of fear memory -

Oscillatory synchronization underlying fear memory expressionRanking 1/5

**B.Sc. & M.Sc. School of Applied Mathematics and Physical Sciences**

2004 – 2011 National Technical University of Athens (NTUA) Grade 7.42/10

Majors Computational Mathematics, Statistics

Thesis EEG signal analysis methods for characterization of meditative states Grade 10/10

**Research methods**

*in vivo* electrophysiology, high-dimensional data analysis, closed-loop optogenetics

**Selected Publications** (Citations: 315 ; h-index: 5 ; \*: equal contribution) ORCID: 0000-0002-1804-9756

1. Prefrontal-Periaqueductal Gray-Projecting Neurons Mediate Context Fear Discrimination **Neuron, 2018**

Rozeske R, Jercog D, **Karalis N**, Chaudun F, Khoder S, Girard D, Winke N, Herry C

1. Prefrontal neuronal assemblies temporally control fear behavior. **Nature, 2016**

Dejean C\*, Courtin J\*, **Karalis N\***, Chaudun F, Wurtz H, Thomas Bienvenu, Herry C

1. 4 Hz oscillations synchronize prefrontal - amygdala circuits during fear behaviour. **Nature Neuroscience, 2016**

**Karalis N**, Dejean C, Chaudun F, Khoder S, Rozeske R, Wurtz H, Bagur S,

Benchenane K, Sirota A, Courtin J, Herry C

1. Prefrontal parvalbumin interneurons shape neuronal activity to drive fear expression. **Nature, 2013**

Courtin J, Chaudun F, Rozeske R, **Karalis N**, Gonzalez-Campo C, Wurtz H, Abdi A,

Baufreton J, Bienvenu T, Herry C

1. Persistence of amygdala gamma oscillations during extinction learning **Neurobiology of Learning**

predicts spontaneous fear recovery. **and Memory, 2013**

Courtin J, **Karalis N**, Gonzalez-Campo C, Wurtz H, Herry C

1. Effects of Himalayan tradition meditation during a SSVEP study. **Neuroscience Letters, 2011**

**Karalis N**, Karanasiou I, Uzunoglu N, & Braboszcz C

**Invited Talks**

**2017** Neuronal synchrony and oscillatory coupling Coupling & Causality in Complex Systems

Neuronal correlates of breathing  Bernstein Conference PhD Symposium

Respiratory entrainment of memory circuits Harvard-LMU Young Scientists' Forum

Respiratory entrainment of prefrontal circuits Japan Neuroscience Society meeting

Prefrontal oscillatory mechanisms of fear behavior British Neuroscience Association meeting

**2016** Oscillatory circuit organization during fear behaviorLMU lecture series

Neuronal signatures of fear behavior Neurizons – Young Investigator Talks

**2015** High-density characterization of network activity German Neuroscience Society

**2014**  Neurophysiological correlates of rodent communication Animal Communication Workshop

**2013** Neuronal signatures of fear memory Neurasmus Workshop

Neuronal signatures of fear memory Neurasmus Orientation Week

**2011** SSVEP effects of Himalayan tradition meditation Breaking Convention

**2007** Novel graph invariants for fast graph isomorphism Mitacs Industrial Math Summer School

Combinatorial and statistical analysis of keno game Canadian Undergraduate Mathematics Conference

**Research Experience**

**2013 – 2018 PhD candidate Ludwig-Maximilians-Universität München** Faculty of Medicine

Mechanisms of memory consolidation across hippocampal and cortical circuits

Advisor: Prof. Dr. Anton Sirota

**2012 – 2013 M.Sc. Thesis Neurocenter Magendie, Bordeaux** INSERM

Neuronal signatures of fear memory

Supervisor: Dr. Cyril Herry

**2009 – 2011 M.Sc. Thesis National Technical University of Athens** Electrical Engineering Dept.

EEG Analysis of the neurophysiological effects of meditation on visual evoked potentials

Supervisors: Dr. Irene Karanasiou & Dr. Nikolaos Uzunoglou

**2005 – 2009 Research assistance National Technical University of Athens**  High Energy Physics Dept.

CERN Grid Computing infrastructure - Network development and administration

**Scholarships and Grants**

**2014 – 2017** Ludwig-Maximilians-Universität München

**2013 – 2014** Centre for Integrative Neuroscience (CIN) - University of Tübingen

**2011 – 2013** Erasmus Mundus scholarship for the Neurasmus Joint Master degree program in Neuroscience

**2010** University of Pennsylvania Grant

**2009** Erasmus scholarship (Research exchange)

**2007** MITACS scholarship

**Awards**

**2010**“Thomaideio Award” for conference presentation from National Technical University of Athens for the

presentation “Short term effects of Vipassanā meditation in a single subject SSVEP study”

**2008** “Thomaideio Award” for best journal publication from National Technical University of Athens for the

publication “Effect of meteorological variables on the incidence of lower urinary tract infections”

**Experimental Techniques**

**Electrophysiology** *in vivo* extracellular recordings (tetrodes, silicon probes, ECoG) in freely behaving & head-fixed rodents high-dimensional neural data analysis, human EEG recordings

**Imaging** calcium imaging in freely-behaving mice (miniscope), fiber photometry

**Circuit manipulation** closed-loop optogenetics, pharmacogenetics & pharmacology

**Programming** Matlab, Python, Julia, Java, C++

**Electronics** circuit design and implementation, electrophysiology and behavioral equipment setup, 3D printing

**Lab techniques** stereotaxic neurosurgeries, behavioral analysis, immunohistochemistry, microscopy, cell cultures

**Other publications**

1. Combinatorial and statistical analysis of keno game. **CUMC Annual, 2007**

**Karalis N**

1. Effect of meteorological variables on the incidence of lower urinary tract infections. **European Journal of Clinical**

Falagas ME, Peppas G, Matthaiou DK, Karageorgopoulos DE, **Microbiology and Infectious**

**Karalis N**, Theocharis G **Diseases, 2009**

1. Novel graph invariants for fast graph isomorphism identification. **Mitacs Proceedings, 2007**

**Karalis N**, Aliaga R, Arnold R, Wu W

**Selected conferences and summer schools**

**2018** 68th Lindau Nobel Laureate Meeting in Physiology & Medicine

11thFENS forum, Berlin

**2017** Junior Scientist Workshop on Neural Circuits and Behavior, Janelia Farm, Washington

Society for Neuroscience Meeting, Washington, DC

Bernstein Conference, Göttingen

Harvard-LMU Young Scientists' Forum, Munich

Japan Neuroscience Society annual meeting, Tokyo

EMBL Symposium Neural Circuits in the Past, Present and Future, Heidelberg

37th Blankenese Conference on Synaptic plasticity & stability, Hamburg

British Neuroscience Association festival, Birmingham

**2016** Probing neuronal circuits during behavior, Bordeaux

Neurizons, Göttingen

**2015** Mechanisms of Memory Consolidation, Reconsolidation and Extinction, Lausanne

3rd Baltic-Nordic Summer School on Neuroinformatics, University of Tartu

Optogenetics Workshop SPP1665, Ruhr University Bochum

7th G-Node Winter Course in Neural Data Analysis, LMU

Bernstein Conference, Heidelberg

11th Meeting of the German Neuroscience Society, Göttingen

**2014** NIN Interneuron Summer School, Amsterdam

Optogenetics: controlling the brain with light, University of Oxford

Society for Neuroscience Meeting, Washington, DC

9th FENS Forum of Neuroscience, Milan

**2013** 1st Live Cell Imaging and Electrophysiology Workshop, Pasteur Institute, Athens

11th Summer Course on Computational Neuroscience, Göttingen

5th G-Node Winter Course in Neural Data Analysis, LMU

Bernstein Conference, Tübingen

**2012** Super Resolution Imaging Techniques Workshop, Bordeaux Imaging Center

Mathematical Cell Biology Graduate Summer Course, University of British Columbia, Vancouver

8th FENS Forum of Neuroscience, Barcelona

7th International Symposium on Neuroprotection and Neurorepair, Potsdam

**2011** Society of Applied Neuroscience meeting, Thessaloniki

Breaking Convention, University of Kent

**2010** 5th International Summer School on Emerging Technologies in Biomedicine, Patras

Summer Program in Computational Neuroscience, University of Pennsylvania, Philadelphia

**Travel grants**

**2018** Onassis Foundation nomination and grant to attend Lindau Nobel Laureate Meeting

FENS-IBRO/PERC travel grant to attend FENS Forum 2018

**2017** BCCN travel grant to attend Bernstein Conference

Janelia Farm travel grant to attend Junior Scientist Workshop on Neural Circuits and Behavior

FENS travel grant to attend JNS Annual Meeting

Travel grant to attend EMBL Symposium on Neural Circuits

Travel grant to attend 37th Blankenese Conference

**2015** University of Tartu – INCF travel grant

**2014** British Neuroscience Association travel grant

**2013** Hellenic Pasteur Institute travel grant

**2011** Thomaideio grant (NTUA) for active participation in conference.

**2010** COST Grant (5th International Summer School on Emerging Technologies in Biomedicine)

Centrum Wiskunde & Informatica (CWI) (Study group Mathematics with Industry)

**2009** Centre de Recherche Cerveau et Cognition

**2008** Danish Center for Applied Mathematics and Mechanics (DCAMM)

Pacific Institute for the Mathematical Sciences (PIMS) grant