DIMITAR KOSTADINOV, PHD

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BIOGRAPHICAL INFORMATION

Date of birth: 28 August, 1987
Citizenship: Bulgaria, USA (UK settled status)

EDUCATION

2015 **Harvard University**, Cambridge, MA, USA
Ph.D., Neuroscience

2009 **McGill University**, Montréal, QC, Canada
B.Sc., Physiology (*First Class Honours*)

RESEARCH EXPERIENCE

2015- **Postdoctoral Research Associate, University College London**
Neural Computation Laboratory, Wolfson Institute for Biomedical Research
Advisor: Michael Häusser
Population coding in the cerebellum during goal-directed behaviour

2009-15 **Ph.D. student, Harvard University**
Center for Brain Science, Department of Molecular and Cellular Biology
Advisor: Joshua R. Sanes
Mechanism and function of dendritic self-avoidance in the mammalian nervous system

2008-9 **Research Assistant, McGill University**
Department of Physiology
Advisor: Ellis Cooper
Activity-dependent tuning of voltage-gated ion channels in sympathetic neurons

HONOURS AND AWARDS

2020 Early Career Neuroscience Prize, *UCL*

2019 Travel Awards: *Guarantors of Brain, The Physiological Society*

2016-18 Long-Term Postdoctoral Fellowship, *EMBO*

2012-15 NRSA Individual Predoctoral Fellowship, *NIH*

2012 Meselson Prize, *Harvard University*

2006 Student-Athlete Academic Honour Roll, *McGill University*

PUBLICATIONS

Google Scholar profile

1. **Kostadinov D**, Häusser M (2022) Reward signals in the cerebellum: origins, targets, and functional implications. ***Neuron*** 110(8): 1290-1303. [link]
2. Sezener E*, Grabska-Barwińska A*, **Kostadinov D***, Beau M, Krishnagopal S, Budden D, Hutter M, Veness J, Botvinick M, Clopath C, Häusser M, Latham PE (2021) A rapid and efficient learning rule for biological neural circuits. *(in revision, pre-print on **bioRxiv**)* [link]
**Co-first authors*
3. Steinmetz NA*, Aydin Ç*, Lebedeva A*, Okun M*, Pachitariu M*,…**Kostadinov D**,…Harris TD (2021) Neuropixels 2.0: A miniaturized high-density probe for stable, long-term brain recordings. ***Science*** 372(6539). [link] (16th of 39 authors)
4. **Kostadinov D***, Beau M, Blanco-Pozo M, Häusser M* (2019) Predictive and reactive reward signals conveyed by climbing fiber inputs to cerebellar Purkinje cells. ***Nature Neuroscience*** 22(6): 950-62. [link]
**Co-corresponding authors*
Previewed article: J. Medina: Teaching the cerebellum about reward [link]
5. **Kostadinov D**, Mathy A, Clark BA (2019) Dynamics of the Inferior Olive Oscillator and Cerebellar Function. In: Manto M, Gruol D, Schmahmann J, Koibuchi N, Sillitoe R (eds) ***Handbook of the Cerebellum and Cerebellar Disorders***. Springer, Cham. [link]

6. Ing-Esteves S, **Kostadinov D**, Marocha J, Sing AD, Joseph KS, Laboulaye MA, Sanes JR, Lefebvre JL (2018) Combinatorial effects of alpha-and gamma-protocadherins on neuronal survival and dendritic self-avoidance. ***Journal of Neuroscience*** 38(11): 2713-29. [link]
7. Peng YR, Tran NM, Krishnaswamy A, **Kostadinov D**, Martersteck EM, Sanes JR (2017) Satb1 regulates contactin 5 to pattern dendrites of a mammalian retinal ganglion cell. ***Neuron*** 95(4): 869-83. [link]
8. **Kostadinov D**, Sanes JR (2015) Protocadherin-dependent dendritic self-avoidance regulates neural connectivity and circuit function. ***eLife*** 4: e08964. [link]
   Previewed article: A. Garrett and R. Burgess: Self-awareness in the retina [link]
9. Lefebvre JL, **Kostadinov D**, Chen WV, Maniatis T, Sanes JR (2012) Protocadherins mediate dendritic self-avoidance in the mammalian nervous system. ***Nature*** 488(7412): 517-21. [link]

ONGOING PROJECTS

1. **Cerebellar learning: fast and slow**
   Employing chronic two-photon imaging and computational modelling to investigate changes in teaching signals conveyed to the cerebellum as animals learn and adapt in a sensorimotor integration task.
2. **Transformation of Purkinje cell population codes in the cerebellar nuclei**
   Using Neuropixels probes to define how inhibitory Purkinje cell outputs are integrated by principal neurons in the cerebellar nuclei [with M. Beau].
3. **Optogenetic identification of cell type-specific spiking signatures in the cerebellar cortex**
   Combining cell type-specific optogenetics, electrophysiology, and machine learning to develop methods to classify cerebellar neurons based on their unique functional identities [with M. Beau, M Oostland, Y. Chung, G. Martinez, M. Maibach].

PROFESSIONAL SERVICE AND ENGAGEMENT

2017- Member, *Physiological Society*

2015- Ad-hoc reviewer: *Cell, eLife, Journal of Neuroscience, Nature Neuroscience, Neuron, PLOS Biology, PNAS, Scientific Reports*

2009- Member, *Society for Neuroscience*

TEACHING EXPERIENCE

2018-19 Course assistant, *Neuropixels Training Course, UCL*

2015 Guest Lecturer, *Cellular Basis of Brain Function, UCL*

2013 Teaching Fellow, *Systems Neuroscience, Harvard University*

2011 Teaching Fellow, *Neurobiology of Behavior, Harvard University*

2008-9 Teaching Assistant, *Mammalian Physiology, McGill University*

MENTORING ACTIVITIES

Supervision of PhD students

2017- Maxime Beau, *UCL* (thesis project)

2012 Olivia Ho-Shing, *Harvard University* (rotation project)

Supervision of MSc students

2019-20 Gabriela Martinez, *CentraleSupélec* (currently Business Intelligence Engineer, Amazon)

Michael Maibach, *UCL* (currently PhD student, McGill University)

2017-18 Yooni Chung, *UCL* (currently Data Engineer, Pirical)

Hassan Bassam, *UCL* (currently PhD student, Max Planck School of Cognition)

2016-17 Marta Blanco-Pozo, *UCL* (currently PhD student, Oxford University)

Supervision of undergraduate students

2021- Sam Clothier, *UCL* (recipient of Physiological Society Summer Studentship)

2020-21 Mátyás Váradi, *UCL* (currently PhD student, Cambridge University)

2017-18 Margaret Conde Parades, *UCL* (recipient of Physiological Society Summer Studentship)

INVITED LECTURES

Feb 2022 *Wu Tsai Institute*, Yale University (virtual)

Dec 2021 *Centre for Developmental Neurobiology*, King's College London (virtual)

Nov 2021 *Department of Cell and Developmental Biology*, University College London (virtual)

Sep 2021 *Department of Physiology*, University of Toronto and SickKids Hospital (virtual)

Jul 2021 *Department of Neuroscience, Physiology, and Pharmacology*, University College London (virtual)

Nov 2020 *Early Career Neuroscience Prize Symposium*, University College London (virtual)

Mar 2020 *Cortex Club,* University of Oxford, Oxford, UK

Dec 2019 *Google DeepMind*, London, UK

Sep 2019 *Department of Neuroscience*, Institute Pasteur, Paris, France

Jul 2019 *Gordon Research Seminar: Cerebellum*, Les Diablerets, CH

May 2019 *Society for Research on the Cerebellum and Ataxia International Symposium*, Sheffield, UK

Apr 2019 *Division of Medicine*, University College London, London, UK

Nov 2018 *Department of Physiology*, McGill University, Montréal, QC, Canada

Jun 2016 *NeuroTuscany*, Monticastelli Pisano, Italy

Sep 2012 *Program in Neuroscience Retreat*, Harvard University, Woods Hole, MA, USA

SELECTED CONFERENCE PRESENTATIONS

Nov 2021 *Society for Neuroscience Annual Meeting* (virtual)
Kostadinov D, Beau M, Häusser M
Fast and slow learning signals mediated by climbing fiber inputs to cerebellar Purkinje cells

Jul 2019 *Gordon Research Conference: Cerebellum*, Les Diablerets, CH
Kostadinov D, Beau M, Blanco-Pozo M, Chung Y, Häusser M
Dynamic coordination of climbing fiber input to cerebellar Purkinje cell populations during learning

Nov 2018 *Society for Neuroscience Annual Meeting*, San Diego, CA
Kostadinov D, Beau M, Blanco-Pozo M, Häusser M
Dynamic coordination of climbing fiber input to Purkinje cell populations during goal-directed action

Nov 2017 *Society for Neuroscience Annual Meeting*, Washington, DC
Beau M*, **Kostadinov D***, Blanco-Pozo M, Häusser M
Probing the functional interactions between neural populations in the cerebellar cortex and deep nuclei of awake behaving mice

Jul 2017 *Gordon Research Conference: Cerebellum*, Lewiston, ME
Kostadinov D, Blanco-Pozo M, Beau M, Häusser M
Population coding in the Purkinje cell network during execution of goal-directed action

Nov 2014 *Society for Neuroscience Annual Meeting*, Washington, DC
Kostadinov D, Sanes JR
Roles of Protocadherin-mediated self-avoidance in retinal circuit function

Apr 2014 *Cold Spring Harbor Meetings: Neuronal Circuits*, Cold Spring Harbor, NY
Kostadinov D, Sanes JR
The role of Protocadherin-mediated self-avoidance in retinal circuit function

Nov 2011 *Society for Neuroscience Annual Meeting*, Washington, DC
Lefebvre JL, **Kostadinov D**, Chen WV, Maniatis T, Sanes JR
Gamma-Protocadherins pattern starburst amacrine dendrites by self-avoidance

Nov 2009 *Society for Neuroscience Annual Meeting*, Chicago, IL
Kostadinov D, Krishnaswamy A, Cooper E
Developing postsynaptic neurons require functional presynaptic innervation to tune voltage-gated currents and fire action potentials at appropriate frequencies

REFERENCES

Professor Joshua Sanes
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Center for Brain Science
Department of Molecular and Cellular Biology
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Cambridge, MA, USA 02138
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