

# SALVADOR DURA-BERNAL, PH.D.

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## ACADEMIC APPOINTMENTS

- 2020-Present **Assistant Professor**  
Dept. of Physiology and Pharmacology  
State University of New York (SUNY) Downstate Health Sciences University, USA
- 2019-Present **Research Scientist IV**  
Center for Biomedical Imaging and Neuromodulation  
Nathan Kline Institute for Psychiatric Research, USA
- 2016-2020 **Research Assistant Professor**  
Dept. of Physiology and Pharmacology  
State University of New York (SUNY) Downstate Medical Center, USA
- 2016 **Adjunct Professor**  
Dept. of Chemical and Biomolecular Engineering  
New York University (NYU), Tandon School of Engineering, USA
- 2015-2016 **Research Instructor**  
Dept. of Physiology and Pharmacology  
State University of New York (SUNY) Downstate Medical Center, USA
- 2012-2015 **Postdoctoral Researcher**  
Dept. of Physiology and Pharmacology  
State University of New York (SUNY) Downstate Medical Center, USA
- 2011-2012 **Postdoctoral Researcher**  
Dept. of Psychology / Dept. of Electrical and Computer Engineering  
University of Plymouth, UK / Johns Hopkins University, USA

## GRANTS

- 2023-2027 **NYS DOH Spinal Cord Injury Research Program Institutional Support.** Restoring motor function after spinal cord injury using multiscale modeling to decode neural latent dynamics from motor cortex EEG. *Amount:* \$300,000; *Role:* PI.
- 2023-2026 **The Hartwell Foundation (UC Davis subaward).** Predicting Intrinsic Excitability of Brain Neuronal Circuits in Neurodevelopmental Disorders to Identify Targeted Therapies. *Amount:* \$88,530; *Role:* Sub PI.
- 2023-2028 **NIH P50 Conte Center.** Neurobiology and Cognitive Role of Slow Brain Network Fluctuations. *Amount:* \$13M, *Role:* Co-Investigator
- 2022-2023 **NIH U24 Administrative Supplement.** Development of robust cloud-based software for co-simulation of biophysical circuit and whole-brain network models. *Amount:* \$221,229; *Role:* PI.
- 2019-2024 **NIH U24,** Dissemination of a tool for data-driven multiscale modeling of brain circuits. *Amount:* \$1,171,482; *Role:* PI.

- 2021-2022 **SUNY Downstate SVPR Seed Grant Funding.** An investigation of the physiological mechanisms responsible for the generation of neocortical fast ripples (>350 Hz), a biomarker of epileptogenic regions. *Amount:* \$50,000; *Role:* PI.
- 2017-2022 **NYS DOH Spinal Cord Injury Research Board (SCIRB) Institutional Support.** Elucidating motor cortex neural coding mechanisms. *Amount:* \$242,500; *Role:* PI.
- 2020-2021 **NSF/Internet2 E-CAS Phase 2.** Deciphering the brain's neural code through large-scale detailed simulation of cortical circuits. *Amount:* \$911,748; *Role:* PI.
- 2020-2021 **Human Brain Project Research Infrastructure.** Integration of NetPyNE into EBRAINS Platform. *Amount:* \$50,000, *Role:* Co-I.
- 2019-2020 **NSF/Internet2 E-CAS Phase 1.** Deciphering the brain's neural code through large-scale detailed simulation of motor cortex circuits. *Amount:* \$177,058, *Role:* Co-I.
- 2018-2019 **NIH BRAIN R01 (Brown University subaward).** Conversion of Human Neocortical Neurosolver (HNN) Model to NetPyNE Specifications. *Amount:* \$89,326; *Role:* Sub PI.

#### **High-Performance Computing (HPC) Allocation Grants:**

- 2022-2023 **HBP/EBRAINS ICEI Resource Allocation.** Detailed Thalamocortical Models. *Resources equivalent to:* ~\$200,000; *Role:* co-I.
- 2022-2023 **NSF ACCESS HPC Research Allocation.** Cortical dynamics in a multiscale model of primary motor cortex regions. *Resources equivalent to:* ~\$200,000; *Role:* co-PI.
- 2021-2022 **NSF XSEDE HPC Research Allocation.** Cortical dynamics in multiscale models of brain regions. *Resources equivalent to:* \$39,612; *Role:* co-PI.
- 2021-2022 **Google Cloud Academic Research Grant.** Deciphering the brain's neural code through large-scale detailed simulation of cortical circuits. *Resources equivalent to:* \$40,000; *Role:* PI.
- 2020-2021 **Google Cloud Platform Research Credits.** Cloud-based modeling tool for data-driven multiscale modeling of cortical circuits. *Resources equivalent to:* \$5,000; *Role:* PI.
- 2017-2020 **NSF XSEDE HPC Research Allocation.** Cortical dynamics in a multiscale model of primary motor cortex. *Resources equivalent to:* \$183,670; *Role:* co-PI.

#### **AWARDS AND HONORS**

- 2022 **Google Open Source Peer Bonus.** Voted by Google employees to recognize external people who have made exceptional contributions to open source code.
- 2021 **Google Cloud Research Innovator.** In recognition of driving scientific breakthroughs using Google Cloud supercomputing.
- 2021 **Elected to Board of Directors,** Organization for Computational Neurosciences.
- 2020 **SUNY PRODiG Faculty Award.** Three years of entry-level faculty salary support.
- 2019 **Robert F. Furchgott Scholar Award.** In recognition of Excellence in Research.
- 2018 **Elected Editor of the NeuroML Editorial Board.** NeuroML is an international collaborative initiative to develop a language for describing detailed neural models.
- 2017 **HPCwire Readers' Choice Award: Best Use of AI.** Developed motor neuroprosthetic system that mimics how the brain learns using supercomputers.
- 2006-2009 **University of Plymouth (UK) Fellowship,** PhD in Computational Neuroscience.

## EDUCATION

- 2006-2011 **Ph.D. in Computational Neuroscience**  
Centre for Robotics and Neural Systems at University of Plymouth · Plymouth, UK  
Dissertation: A cortical model of object perception based on Bayesian networks and belief propagation (Advisor: S. Denham; Examiner: A. Sillito, UCL).
- 2000-2006 **B.Sc., M.Sc. in Telecommunication Engineering**  
Universidad de Las Palmas de Gran Canaria · LPGC, Spain

## TEACHING AND MENTORING EXPERIENCE

- 2015-Present **SUNY Downstate semester-long graduate** course in Computational Neuroscience (developed curriculum; taught 5 years).
- 2015-Present **SUNY Downstate Mentor/Supervisor**, 4 postdocs and 5 graduate students.
- 2023 **5th Latin-American Summer School in Computational Neuroscience (LACONEU)**, University of Valparaiso, Chile.
- 2022-2023 **Electromagnetism and the Brain Graduate Course Lectures**, Rice University.
- 2020 **VIII Latin American School on Computational Neuroscience (LASCON)**, Institute of Mathematics and Statistics, University of Sao Paulo, Brazil
- 2019 **Principles of Computational Neuroscience Course**, Sassari University, Sardinia.
- 2018 **NEURON Summer Course**, Emory University, Atlanta.
- 2018 **VII Latin American School on Computational Neuroscience (LASCON)**, Institute of Mathematics and Statistics, University of Sao Paulo, Brazil
- 2016-2018 **Bronx high-school of Science Mentor**, 3 students for Intel Regeneration Science Talent Search (all reached semifinals).
- 2016 **NYU Tandon School of Engineering** semester-long undergraduate course Topics in Biology: Computational Neuroscience (developed curriculum).
- 2014 **SfN'14 NEURON Workshop**, Lecturer, Washington, US
- 2009-2010 **University of Plymouth**, TA for modules of BSc and MSc in Computer Science, UK.

## ORGANIZATION OF MEETINGS, WORKSHOPS AND COURSES

- 2023 **CNS'23 Tutorial organizer**. Building mechanistic multiscale models with NEURON, NetPyNE, and TREES. Leipzig.
- 2022 **CNS'22 Tutorial organizer**. Building mechanistic multiscale models from molecules to circuits using NEURON and NetPyNE. Melbourne.
- 2022 **International seminar organizer**. Consumer rights and neurotechnologies. Milan.
- 2021 **International Workshop organizer**, Risks and challenges of neurotechnologies for human rights. Online.
- 2021 **CNS'21 Tutorial organizer**, Building biophysically detailed neuronal models from molecules to networks with NEURON and NetPyNE. Online
- 2021 **Online 2-week Course organizer**, Multiscale modeling of brain circuits using NetPyNE.
- 2020 **CNS'20 Workshop organizer**, Tools and resources for developing and sharing models in computational neuroscience. Online.

- 2020 **CNS'20 Tutorial organizer**, Building mechanistic multiscale models, from molecules to networks, using NEURON and NetPyNE. Online.
- 2019 **CNS'19 Tutorial organizer**, Building biophysically detailed neuronal models: from molecules to networks, Barcelona.
- 2018 **CNS'18 Tutorial organizer**, Multiscale Modeling from Molecular to Large Network Level, Seattle.
- 2017 **Bernstein Conference Workshop organizer**, Multiscale Modeling and Simulation, Gottingen.

## INVITED TALKS

- 2023 **Interface Rice**. Modeling the Human Brain: Macro, Meso, and Microscale. May 18.
- 2022 **SfN NSG Satellite Workshop**. Enabling Large Scale Modeling, Data Processing and Dissemination of Software. Nov 12.
- 2022 **NeuroQSP working group**. Introducing Pharmacometricians to the World of Computational Neuroscience. Aug 17.
- 2022 **Drexel University**. Neurotechnology and the law. Oct 28
- 2022 **Yale (Rajiv) and others (see slides)**
- 2022 **INCF Neuroinformatics Assembly**. Large-scale thalamocortical circuit models. Sep 13.
- 2021 **Eastern Regional Network**, Leveraging the cloud to decipher the brain neural code, Dec 2.
- 2021 **University of LPGC, Engineering Dept**, From Telecomms to Neuroscience, Dec 6.
- 2021 **Google's Government & Education Summit**, Funding for Cloud Research, Nov 4.
- 2021 **Florida Atlantic University**, Complex Systems and Brain Sciences Center Seminar. Oct 15.
- 2021 **New Jersey Institute of Technology (NJIT)**, BME Seminar, Sept 23.
- 2021 **Training Resources for Cross Initiative Data-driven Modeling Workflows**. CNS'21. Jul 6.
- 2021 **INCF Neuroinformatics Assembly**. Computational neuroscience FAIR approaches. Apr 20.
- 2020 **MetaCell Webinar**. Data Analysis and Visualization, Dec 10.
- 2020 **NSF CloudBank round table**. NSF-funded researchers using Google Cloud. Nov 21.
- 2020 **COMBINE'20 Workshop**. Multiscale modeling with NetPyNE. Oct 9.
- 2020 **University of Houston BME**. Deciphering the brain's neural code. Sep 17.
- 2020 **CNS'20 Workshop**. Machine learning and mechanistic modeling for understanding brain in health and disease, Online. July 18
- 2019 **Nathan Kline Institute for Psychiatric Research**. C-BIN Seminar Series. Oct 7.
- 2019 **CUNY Graduate Center**. Neuroscience Collaborative Seminar Series. September 27.
- 2019 **Brown University**. Workshop on Multiscale Network Modeling. May 24.
- 2018 **Google Next'18 London conference**. Session: Computing with Power not Previously Possible. London, UK. October 11.
- 2018 **Google HPC Hackathon**. London, UK. October 9.
- 2018 **MetaCell Webinar**. Building Multiscale Brain Models. September 26.
- 2018 **Google Next'18 San Francisco conference**. Session: Computing with Power not Previously Possible. San Francisco. July 26.

- 2018 **CNS'18 Workshop.** Developing, standardising and sharing large scale cortical network models, Seattle. July 15.
- 2018 **MIT.** Inspired by Ramon y Cajal Talks, Boston. June 26.
- 2018 **UC Davis.** Center for Neuroscience. Davis. May 15.
- 2016 **University of Sao Paulo.** Research, Innovation and Dissemination Center for Neuromathematics, Sao Paulo, Brazil. April 11.
- 2015 **New York University (NYU),** Meet the Professional Series, Tandon School of Engineering. New York. April 24.
- 2013 **Johns Hopkins University.** Applied Neuroscience Seminar, Applied Physics Lab, Baltimore. June 5.
- 2010 **University of Sheffield.** Probabilistic Neural Computation. Sheffield, UK. Nov 15.

### OUTREACH AND DISSEMINATION

- 2016-Present **Neuroscience talks** in middle/high schools. Spanish Scientists in USA (ECUSA), NY
- 2014 **Afterschool neuroscience course.** Developed and taught semester-long course at Brooklyn middle schools. New York Academy of Science, NY.
- 2011 **Spanish and English as second language.** Summer school in Dakar, Senegal.
- 2009-2012 **STEM Ambassadors programme.** Science engagement talks at schools and community colleges, Plymouth, UK.

### PROFESSIONAL DEVELOPMENT

- 2023 **AMS NY Science Forward: Towards Inclusive Excellence in Academia,** CSHL
- 2021 **DARPA Research Mission and Funding Opportunities** workshop, SUNY Downstate.
- 2020 **Write Winning NIH Grant Proposals** workshop, SUNY Downstate.
- 2020 **Organizing Time, Tasks & Projects** workshop, SUNY Downstate.
- 2019 **Blue Brain Project Hackathon,** NEURON ecosystem, Yale University, Connecticut.
- 2018 **Google Cloud Platform Fundamentals: Big Data & Machine Learning,** New York.
- 2014 **Interfacing Models with Brain Signals** to Investigate Cognition Workshop, Irvine.
- 2014 **Practicum in Teaching STEM and Mentoring** Middle School Students. New York Academy of Science Graduate Course, NY.
- 2010 **Cognitive Neuromorphic Engineering** Workshop, Capocaccia, Italy.
- 2008 **Parallel C and Neuron** Workshop, Plymouth, UK.
- 2008 **Bayesian Cognition** winter school, Chamonix, France.

### UNIVERSITY SERVICE

- 2022-Present **Member of the Research Advisory Committee (LRAC),** Office of the SVPR, SUNY Downstate.
- 2022 **Reviewer for SVPR Office Seed Grant Program,** SUNY Downstate.

- 2022- Present **Executive Committee Member of BME graduate program**, School of Graduate Studies, SUNY Downstate.
- 2022-Present **Member of the Laboratory Research Advisory Committee (LRAC)**, Office of the SVPR, SUNY Downstate.
- 2021-Present **Member of Executive Committee's Research, Resources, and Budget Sub-Committee**, College of Medicine, SUNY Downstate.
- 2021-Present **Chair of the Faculty HPC Advisory Committee**, Senior VP for Research office, SUNY Downstate.
- 2020-2021 **LCME Accreditation Junior Faculty Panel**, School of Medicine, SUNY Downstate
- 2019-Present **Faculty member of the NBS and BME graduate programs**, School of Graduate Studies, SUNY Downstate.
- 2019-Present **Qualifying Exam Committee**, School of Graduate Studies, SUNY Downstate
- 2018-Present **High Performance Computing (HPC) Initiative**: set up and administration of physical and cloud (Google Cloud Platform) HPC resources, SUNY Downstate.

## PROFESSIONAL SOCIETIES AND ADVISORY COMMITTEES

- 2019 **Program Committee Member**, Latin-American Workshop on Computational Neuroscience.
- 2018-Present **Founding member**, INCF Special Interest Group on Standardised Representations of Network Structures
- 2014-Present **Member Interagency Modeling and Analysis Group**, Multiscale Modeling Computational Neuroscience Working Group
- 2014-Present **Member**, Society for Neuroscience. Attended meeting and presented every year.
- 2014-Present **Member**, Organization for Computational Neuroscience
- 2014-2015 **Member**, Society for the Neural Control of Movement

## ACADEMIC SERVICE

- **Grant Reviewer**: NIH Early Career Reviewer (ECR) program, NIH Sensorimotor Integration study section (Oct 2020), NIH BRAIN Initiative Data Integration study section (Feb 2021), NIH Modeling and Analysis of Biological Systems Study Section (May 2022), US Army Research Office.
- **Journal Editor**: Frontiers in Computational Neuroscience, Frontiers in Neuroprosthetics, Frontiers in Systems Biology - Integrative Systems Neuroscience
- **Journal Reviewer**: Nature Communications, eLife, Journal of Neurophysiology, Nature Scientific Reports, PLoS Computational Biology, Cerebral Cortex, PLoS ONE, Frontiers in Neuroinformatics, Neural Computation, Neural Networks, Pattern Recognition Letters, Drug Discovery Today, eNeuro.

## OTHER PROFESSIONAL SKILLS

- **Programming**: Python, NEURON, MATLAB, C, C++, JAVA, Javascript, PHP.
- **Supercomputing**: Administrator of 500-core HPC, NVIDIA K40 GPU and Google Cloud Computing.
- **Robotics**: Barrett's 7-DOF WAM robot arm.

## SOFTWARE DEVELOPMENT

- **NetPyNE**: Tool that provides programmatic and graphical interface to build, run parallel simulations, optimize, and analyze data-driven biophysically-detailed multiscale network models in NEURON. Over 75 users in 40+ labs. [www.netpyne.org](http://www.netpyne.org) ; <https://github.com/Neurosim-lab/netpyne>
- **Human Neocortical Neurosolver (HNN)**: Tool that enables researchers and clinicians to test and develop hypotheses on the circuit mechanism underlying their EEG/MEG data. <http://brown.hnn.edu>
- **Simulations**: Over 20 simulations of different brain regions and phenomena implemented and shared on model databases ModelDB, Github or OpenSourceBrain (OSB).

## PUBLICATIONS

### Journal Papers

32. [Dura-Bernal S](#), Neymotin SA, Suter BA, Dacre J, Moreira JVS, Urdapilleta E, Schiemann J, Duguid I, Shepherd GMG, Lytton WW. (2023) **Multiscale model of primary motor cortex circuits reproduces in vivo cell type-specific dynamics associated with behavior.** *Cell Reports* 2023 Jun 8;42(6):112574.
31. Ponzi A, [Dura-Bernal S](#), Migliore M (2023) **Theta-gamma phase amplitude coupling in a hippocampal CA1 microcircuit.** *PLoS Computational Biology* 19(3): e1010942.
30. Neymotin SA, Barczak A, O'Connell MN, McGinnis T, Markowitz N, Espinal E, Griffith E, Anwar H, [Dura-Bernal S](#), Lytton WW, Jones SR, Bickel S, Lakatos P. (2022) **Detecting spontaneous neural oscillation events in primate auditory cortex.** *eNeuro* 2022 9 (4) ENEURO.0281-21.2022
29. [Dura-Bernal S\\*](#), Griffith EY\*, Barczak A, O'Connell MN, McGinnis T, Schroeder C, Lytton WW, Lakatos P, Neymotin SA. (2022) **Data-driven multiscale model of macaque auditory thalamocortical circuits reproduces in vivo dynamics.** *BioRxiv* 2022.02.03.479036. \* Equal first authors
27. Borges F, Moreira J, Takarabe LM, Lytton WW, [Dura-Bernal S](#). (2022) **Large-scale biophysically detailed model of somatosensory thalamocortical circuits in NetPyNE.** *Frontiers in Neuroinformatics* doi: 10.3389/fninf.2022.884245
26. Awile O, Kumbhar P, Cornu N, [Dura-Bernal S](#), King JG, Lupton O, Magkanaris I, McDougal RA, Newton AJH, Pereira F, Savulescu A, Carnevale NT, Lytton WW, Hines ML, Schürmann F. (2022) **Modernizing the NEURON Simulator for Sustainability, Portability, and Performance.** *Frontiers in Neuroinformatics*, 10.3389/fninf.2022.884046.
25. Anwar H, Caby S, [Dura-Bernal S](#), D'Onofrio D, Hasegan D, Deible M, Grunblatt S, Chadderdon GL, Kerr CC, Lakatos P, Lytton WW, Hazan H, Neymotin SA (2022) **Training a spiking neuronal network model of visual-motor cortex to play a virtual racket-ball game using reinforcement learning.** *PLoS ONE* 17(5): e0265808. <https://doi.org/10.1371/journal.pone.0265808>
24. Sekiguchi K, Medlock L, [Dura-Bernal S](#), Prescott SA, Lytton WW (2021) **Multiscale computer model of the spinal dorsal horn reveals changes in network processing associated with chronic pain.** *Journal of Neuroscience*, 42 (15) 3133-3149; DOI: <https://doi.org/10.1523/JNEUROSCI.1199-21.2022>

23. Kelley C, [Dura-Bernal S](#), Neymotin SA, Antic SD, Carnevale NT, Migliore M, Lytton WW (2021) **Effects of Ih and TASK-like shunting current on dendritic impedance in layer 5 pyramidal-tract neurons.** *Journal of Neurophysiology*. 10.1152/jn.00015.2021
22. Romaro C, Najman F, WW Lytton, Roque AC, [Dura-Bernal S](#) (2021) **NetPyNE implementation and rescaling of the Potjans-Diesmann cortical microcircuit model.** *Neural Computation* (2021) 33 (7): 1993–2032.
21. Neymotin SA, Barczak A, O'Connell MN, McGinnis T, Markowitz N, Espinal E, Griffith E, Anwar H, [Dura-Bernal S](#), Lytton WW, Jones SR, Bickel S, Lakatos P. **Taxonomy of neural oscillation events in primate auditory cortex** *bioRxiv*, 2020.04.16.045021 [Preprint].
20. Kuhl E, Alber M, Tepole BA; Cannon WR; De S; [Dura-Bernal S](#), Garikipati K, Karniadakis GE, Lytton WW, Perdikaris P, Petzold L. (2019) **Multiscale modeling meets machine learning: What can we learn?** *Archives of Computational Methods in Engineering*. DOI: s11831-020-09405-5
19. Dai K, Hernando J, Billeh JN, Gratiy SL, Planas J, Davison AP, [Dura-Bernal S](#), Gleeson P, Devresse A, Gevaert M, King JG, Van Geit WAH, Povolotsky AV, Muller E, Courcol J-D, Arkhipov A (2019). **The SONATA Data Format for Efficient Description of Large-Scale Network Models.** *PLOS Computational Biology* 16(2): e1007696. <https://doi.org/10.1371/journal.pcbi.1007696>
18. Gao P, Graham J, Zhou W, Jang J, Angulo S, [Dura-Bernal S](#), Hines ML, Lytton WW, and Antic S (2020) **Local Glutamate-Mediated Dendritic Plateau Potentials Change the State of the Cortical Pyramidal Neuron.** *Journal of Neurophysiology (In Press)*.
17. Peng G, Alber M, Buganza A, Cannon W, De S, [Dura-Bernal S](#), Garikipati K, Karniadakis G, Lytton W, Perdikaris P, Petzold L, Kuhl E. (2019) **Integrating Machine Learning and Multiscale Modeling: Perspectives, Challenges, and Opportunities in the Biological, Biomedical, and Behavioral Sciences.** *Nature Partner Journals (npj) Digital Medicine*, 2, 115.
16. [Dura-Bernal S](#), Suter B, Gleeson P, Cantarelli M, Quintana A, Rodriguez F, Kedziora DJ, Chadderdon GL, Kerr CC, Neymotin SA, McDougal R, Hines M, Shepherd GMG, Lytton WW. (2019) **NetPyNE: a tool for data-driven multiscale modeling of brain circuits.** *eLife* 2019;8:e44494
15. Gleeson P, Cantarelli M, Quintana A, Earnsah M, Piasini E, Birgiolas J, Cannon RC, Cayco-Gajic A, Crook S, Davison AP, [Dura-Bernal S](#), et al. (2019) **Open Source Brain: a collaborative resource for visualizing, analyzing, simulating and developing standardized models of neurons and circuits.** *Neuron*, 10.1016/j.neuron.2019.05.019.
14. [Dura-Bernal S](#), Neymotin SA, Suter BA, Shepherd GMG, Lytton WW (2019) **Multiscale dynamics and information flow in a data-driven model of the primary motor cortex microcircuit** *bioRxiv*, 201707 [Preprint]
13. Cantarelli M, Marin B, Quintana A, Earnsah M, Court R, Gleeson P, [Dura-Bernal S](#), Silver RA, Idili G (2018) **Geppetto: a reusable modular open platform for exploring neuroscience data and models.** *Philos. Trans. Royal Soc. B* 373: 20170380.
12. Kerr CC, [Dura-Bernal S](#), Smolinski TG, Chadderdon GL, Wilson DP (2018) **Optimization by Adaptive Stochastic Descent.** *PLoS ONE*, 13(3):e0192944
11. Neymotin SA, [Dura-Bernal S](#), Moreno H, Lytton WW. (2017) **Computer modeling for pharmacological treatments for dystonia.** *Drug Discovery Today: Disease Models*, 19:51-57.



10. [Dura-Bernal S](#), Neymotin SA, Kerr CC, Sivagnanam S, Majumdar A, Francis JT, Lytton WW (2017) **Evolutionary algorithm optimization of biological learning parameters in a biomimetic neuroprosthesis**. *IBM Journal of Research and Development (Comp. Neuro. special issue)*, 61:2/3.
9. Neymotin SA, Suter BA, [Dura-Bernal S](#), Shepherd GMG, Migliore M, Lytton WW (2017) **Optimizing computer models of corticospinal neurons to replicate in vitro dynamics**. *Journal of Neurophysiology*, 117(1):148-162.
8. Neymotin SA, [Dura-Bernal S](#), Lakatos P, Sanger TD, Lytton WW (2016) **Multitarget multiscale simulation for pharmacological treatment of dystonia in motor cortex**. *Frontiers in Pharmacology*, 7:157.
7. Lytton WW, Seidenstein AH, [Dura-Bernal S](#), Schurmann F, McDougal RA, Hines ML (2016) **Simulation neurotechnologies for advancing brain research: Parallelizing large networks in NEURON**. *Neural Computation*, 28:2063-2090.
6. [Dura-Bernal S](#), Li Kan, Neymotin SA, Francis JT, Principe JC, Lytton WW (2016) **Restoring behavior via inverse controller in a lesioned cortical spiking model driving a virtual arm**. *Frontiers in Neuroscience (Neuroprosthetics)*, 10:28.
5. [Dura-Bernal S](#), Zhou X, Neymotin SA, Przekwas A, Francis JT, Lytton WW (2016) **Cortical spiking network interfaced with virtual musculoskeletal arm and robotic arm**. *Frontiers in Neurorobotics*, 9:13.
4. Lee G, Matsunaga A, [Dura-Bernal S](#), Zhang W, Lytton WW, Francis JT, Fortes AB (2014) **Towards real-time communication between in vivo neurophysiological data sources and simulator-based brain biomimetic models**. *Journal of Computational Surgery*, 3:12.
3. [Dura-Bernal S](#), Chadderdon GL, Neymotin SA, Francis JT, Lytton WW (2014) **Towards a real-time interface between a biomimetic model of sensorimotor cortex and a robotic arm**. *Pattern Recognition Letters*, 36:204-212.
2. [Dura-Bernal S](#), Garreau G, Georgiou J, Andreou A, Denham SL, Wennekers T (2013) **Multimodal integration of micro-Doppler sonar and auditory signals for behaviour classification with convolutional networks**. *International Journal of Neural Systems*, 23:1350021.
1. [Dura-Bernal S](#), Wennekers T, Denham SL (2012) **Top-Down Feedback in an HMAX-Like Cortical Model of Object Perception Based on Hierarchical Bayesian Networks and Belief Propagation**. *PLoS ONE*, 7(11):e48216.

### **Conference Papers, Book Chapters and Books**

11. Sosa-Navarro M, Gulotta C, [Dura-Bernal S](#), Starke C. **The risks and challenges of neurotechnologies for human rights**. UNESCO UNESDOC Digital Library. ISBN :978-92-3-100567-1.
10. Lytton WW, Sherif MA, [Dura-Bernal S](#), Neymotin S. (2020) **Multiscale modeling of a “mental” disease**. *Virtual Physiological Human Conference, VHP2020*.
9. Sivagnanam S, Gorman W, Doherty D, Neymotin S, Hovhannisyan H, Fang S, Lytton W, [Dura-Bernal S](#) (2020) **Simulating large-scale models of brain neuronal circuits using Google Cloud Platform**. *Practice and Experience in Advanced Research Computing, PEARC2020*. 10.1145/3311790.3399621
8. Li K, [Dura-Bernal S](#), Francis JT, Lytton WW, Principe JC (2015) **Repairing lesions via kernel adaptive inverse control in a biomimetic model of sensorimotor cortex**. *In Neural Engineering (NER), 2015 7th International IEEE/EMBS Conference*, pp. 478-481, IEEE.

7. [Dura-Bernal S](#), Chadderdon GL, Neymotin SA, Zhou X, Przekwas A, Francis JT, Lytton WW (2013) **Virtual musculoskeletal arm and robotic arm driven by a biomimetic model of sensorimotor cortex with reinforcement learning**. In *Signal Processing in Medicine and Biology Symposium (SPMB)*, pp. 1-5, IEEE.
6. Ramenahalli R, Mendat D, [Dura-Bernal S](#), Culurciello E, Niebur E, Andreou AG (2013) **Audio-Visual Saliency Map: Overview, Basic Models and Hardware Implementation**. In *Information Sciences and Systems (CISS), 2013 47th Annual Conference on, 2013*, pp. 1-6, IEEE.
5. Garreau G, [Dura-Bernal S](#), Andreou C, Andreou A, Georgiou J, Wennekers T, Denham SL (2011) **Gait-based person and gender recognition using micro-Doppler signatures**. In *Biomedical Circuits and Systems Conference (BioCAS)*, pp.444-7, IEEE.
4. [Dura-Bernal S](#), Garreau G, Andreou C, Andreou A, Georgiou J, Wennekers T, Denham SL (2011) **Human action categorization using ultrasound micro-Doppler signatures**. *Human Behavior Understanding*, In series: Lecture Notes in Computer Science Volume 7065, 2011 pp 18-28, Springer Berlin Heidelberg.
3. [Dura-Bernal S](#), Denham SL, Wennekers T (2011) **The Role of Feedback in a Hierarchical Model of Object Perception**. *From Brains to Systems: Brain-Inspired Cognitive Systems*, In series: Advances in Experimental Medicine and Biology, Volume 718, pp 165-79 Springer New York.
2. [Dura-Bernal S](#), Wennekers T, Denham SL (2011) **Modelling object perception in cortex: hierarchical Bayesian networks and belief propagation**. In *Information Sciences and Systems (CISS), 45th Annual Conference on, 2011* pp.1-6, IEEE.
1. Denham SL, [Dura-Bernal S](#), Coath M, Balaguer-Ballester E (2010) **Neurocomputational Models of Perceptual Organization** *Unconscious memory representation in perception: Processes and mechanisms in the brain*, In series: Advances in Consciousness Research 78, Chapter 6. pp 147-177, John Benjamins Publishing.

### **Conference abstracts**

Over 70 poster abstracts at the Society for Neuroscience, Computational for Neuroscience and other international conferences.