



UNIVERSITÀ DI PISA  
**DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE**  
**Dottorato di Ricerca in Ingegneria dell'Informazione**

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Doctoral Course

**“Computational Neuroscience”**

Prof. Michele Migliore

*Institute of Biophysics, National Research Council, Italy*  
*State University of New York (SUNY), Downstate Health Science University, USA*

[michele.migliore@cnr.it](mailto:michele.migliore@cnr.it) [michele.migliore@downstate.edu](mailto:michele.migliore@downstate.edu)

**Short Abstract:**

*The main goal of this course is to develop in the students the capacity to use the specific language of Computational Neuroscience for a multiscale modeling approach, in order to study and understand the physiological and pathological processes underlying cognitive functions and the mechanisms for generating, encoding, and transmitting signals in the central nervous system.*

**Course Contents in brief:**

Signals propagation in the dendrites. Use of 3D neuron reconstructions; The NEURON simulation environment. Synaptic transmission and plasticity. Kinetics of ion channels activation and inactivation. Ion channels and their role in the generation, modulation, and propagation of action potentials in the dendrites. Implementation of a realistic neuronal network. Models for pattern recognition and associative memory. Computational models to investigate brain diseases, drug effects, biochemical pathways, and external factor such as Electrical Fields. Olfactory Bulb and Hippocampus: neuron types, network architecture, and the emergence of computational properties. Explainable Artificial Intelligence using brain-inspired circuitry. Hands-on experience in writing and modifying simulation scripts for biologically realistic models, including the use of HPC resources and EBRAINS tools for state-of-the-art computational neuroscience workflows.

**Total # of hours of lecture: 20**

**References:**

Course Slides

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**CV of the Teacher (full CV attached)**

**Michele Migliore** is an internationally recognized computational neuroscientist with over 40 years of experience in multiscale modeling of neural systems, spanning molecular dynamics to full-scale brain circuits. He has played a pioneering role in the development of biologically realistic models of hippocampal and olfactory bulb networks, tightly integrated with experimental data. Author of more than 160 peer-reviewed publications ( $\approx 10,000$  citations; h-index 51), his work has shaped current understanding of dendritic processing, synaptic integration, learning, and memory. He has held senior research and leadership positions at the Italian National Research Council (CNR) and served as Visiting Scientist or Professor at leading institutions including Yale University and SUNY Downstate. His research combines high-performance computing, data-driven modeling, and translational neuroscience, with applications to neurodegenerative and neuropsychiatric disorders.

**Final Exam:** oral examination

**Room and Schedule**

Room: *Aula Riunioni del Dipartimento di Ingegneria dell'Informazione, Via G. Caruso 16, Pisa – Ground Floor*

Schedule:

Mar 16<sup>th</sup> 2026 – 09:00-13:00

Mar 17<sup>th</sup> 2026 – 09:00-13:00

Mar 18<sup>th</sup> 2026 – 09:00-13:00

Mar 19<sup>th</sup> 2026 – 09:00-13:00

Mar 20<sup>th</sup> 2026 – 09:00-13:00

## **Michele Migliore: Curriculum Vitae**

Born in Palermo, March 21, 1957

**Education:** October 1980, University of Palermo; D. Phil. (Physics, Summa cum Laude)

**Lab website:** <https://migliore.pa.ibf.cnr.it/index.php>

162 Publications, 9906 citations, h-index 51, i-10 index 112 (font: Google Scholar, Nov 2025)

### **Current positions**

Since Apr.2024: Senior Associate, Institute of Biophysics, National Research Council (CNR), Palermo (Italy).

Since Mar.2025: Res. Scientist, SUNY Dept. of Neurology, Downstate Health Science University, Brooklyn NY, USA

### **Previous positions**

1983- 1998: Research Scientist, Institute for Interdisciplinary Applications of Physics, CNR, Palermo (Italy).

1998-2020: Senior Research Scientist, National Research Council (CNR), Institute of Biophysics, Palermo (Italy).

1994-1995: Visiting Professor, Physics Dept. University of Palermo, Theory and Applications of artificial neural networks.

2004-2020: Visiting Research Scientist, Yale University School of Medicine, Dept. of Neuroscience, New Haven, USA.

2001-2015: Visiting Professor of Cybernetics, University of Palermo, Dept. of Mathematics and Informatics, Palermo, Italy.

2002-2003: Visiting Professor, Informatics, University of Palermo, Dept. of Natural Sciences, Palermo, Italy.

2009- 2010: Research Fellow, Krasnow Institute of Advanced Study, George Mason University (Fairfax, USA).

2015 - 2017: Director's Delegate, National Research Council, Institute of Biophysics, Palermo Section (Italy)

2020-2024: Research Director, National Research Council (CNR), Institute of Biophysics, Palermo (Italy).

2018-2023: Visiting Professor of Computational Neuroscience, University of Rome "La Sapienza", Department of Neurobiology, Rome, Italy

### **Fellowships and Awards**

1987: NATO Advanced Fellowship in Biophysics, IBM Research Centre (Kingston, NY, USA).

1997: NATO Senior Fellowship in Biotechnologies and Molecular Biology, Baylor College of Medicine (Houston, USA).

2007: DEISA (Distributed European Infrastructure for Supercomputing Applications) award for project LASIMOLF (Large scale realistic Simulations of the OLfactory bulb)

2012: PRACE (Partnership for Advanced Computing in Europe) award for project LSS-BULB, Large Scale Simulations of the olfactory BULB)

2014: PRACE award for project 3DBULB

- 2015: PRACE award for project SMOLER, Synaptic Mechanisms underlying Odor Learning and Recognition
- 2016: PRACE award for project LACEHIP, Large scale Cellular model of the Hippocampus
- 2019: PRACE award for project BEMM Brain functions Emerging from a data-driven Multi scale realistic Model of the hippocampus CA1 circuitry

### **Professional activities and Management assignments**

- Scientific Coordinator of the EBRAINS-Italy Research Infrastructure (PNRR)
- Member of the Scientific Infrastructure Board, Human Brain Project, EU
- Member of the High-Level Support Team Steering Committee, Human Brain Project, EU
- Director's Delegate, National Research Council, Institute of Biophysics, Palermo Section (Italy), 2015 - 2017:
- National Coordinator: Research project *Development, implementation and applications of new parallel architectures and concurrent algorithms for Transputers networks*, 1990.
- National Coordinator: Research project *Development, implementation and modeling of neuronal networks*, 1992.
- National Coordinator: Research project *Neuronal networks: biophysical modeling and applications*, within the CNR Strategic Project on Neural Networks, 1993.
- Member of Scientific Board, National Research Council - Institute for Interdisciplinary Applications of Physics, 1984-1988, 1988-1992, 1992-1996, 1996-1998.
- Committee Member, National Research Council, Palermo Research Area, 1994-1997.
- Editorial Board Member, International Journals: *Computational and Mathematical Methods in Medicine*, Hindawi Publishing Corporation; *Computational Intelligence and Neuroscience*, Hindawi Publishing Corporation
- Associate Editor: *PLoS Computational Biology*, *Frontiers in Cellular Neuroscience*.
- Reviewer of proposals submitted to EU FP2,3,4, Biotechnology and Biological Sciences Research Council (UK), and Medical Research Council (UK); 1996- present.
- Reviewer for many international journals, such as PNAS, J.Neurosci., J.Neurophysiol., Neural Comp., Eur. J. Neurosci., Biol. Cybern., J. Physiol., Neuroinformatics, PLOS journals, Frontiers Journals, and others.

### **Past and ongoing international collaborations**

- IBM Research Center, Poughkeepsie, NY, USA. Collaboration with E. Clementi (1983);
- Institut für Physikalische Chemie, Aachen, Germany. Collaboration with A. Geiger. (1984);
- Max Planck Institut für Chemie, Mainz, Germany. Collaboration with K. Heinzinger. (1985);
- Institute for Theoretical Physics, Santa Barbara, CA, USA. Collaboration with J.J. Hopfield. (1986);
- IBM Research Center, Kingston, NY, USA. Collaboration with E. Clementi e G. Corongiu. (1988);
- Baylor College of Medicine, Houston, TX, USA (1992-1996). Collaboration with D. Johnston;
- Rutgers University, Center for Molecular and Behavioral Neuroscience, Newark, NJ, USA (1998). Collaboration with G. Buzsaki;
- Norwegian University of Life Sciences, Aas, Norway (2009-2011); collaboration with Gaute Einevoll;

- Feinberg School of Medicine, Northwestern University, Chicago, USA (2010-2012); collaboration with Gordon Shepherd Jr.
- Krasnow Institute of Advanced Study, George Mason University, Fairfax, USA, (2004-2011); collaboration with G.A. Ascoli;
- University College London, Department of Pharmacology, UK, Collaboration with Mala Shah;
- University of Naples “Federico II”, Department of Neuroscience and Reproductive and Odontostomatological Sciences, collaboration with M. Taglialatela;
- University of Naples “Federico II”, Department of Mathematics, Naples (Italy); collaboration with A. Marasco;
- European Brain Research Institute, Roma (Italy), collaboration with Enrico Cherubini;
- Yale University, Department of Neuroscience, New Haven, USA, Collaboration with Gordon Shepherd e Michael Hines;
- William Lytton, Dept. of Neurology, SUNY downstate, Brooklyn, USA
- CNRS, Institut de Pharmacologie Moléculaire et Cellulaire, Valbonne (FR), Helene Marie;
- Otto-von-Guericke-Universität, Institute for Physiology, Magdeburg, collaboration with Volkmar Lessmann;
- EPFL, Blue Brain Project, Lausanne, CH;
- Hungarian Academy of Sciences, Institute of Experimental Medicine, collaboration with Szabolcs Kali;

### **Most recent invited talks**

- XIII. Magdeburg International Neurobiological Symposium "Learning and Memory", Magdeburg, Feb. 2015
- School of Brain Cells & Circuits “Camillo Golgi”, Erice (Italy), Dec 2015.
- NeuroMath, Mathematical and Computational Neuroscience workshop, Cortona, Italy (2016)
- International Workshop on Brain Inspired Computing, Cetraro, Italy (2017)
- Okinawa Inst. of Science and Tech., Comput. Neuroscience Workshop, Okinawa, Japan (2017).
- School of Brain Cells & Circuits “Camillo Golgi”, Erice, Italy (2017).
- Conference Organization and Chairman, First annual Summit of the CIRPROT EU Project (2017)
- HBP Curriculum Series; Neurobiology for non-specialists, Innsbruck, July 2017
- XV Seminar on Software for Nuclear, Subnuclear and Applied Physics, Alghero, May 2018
- 7th International Summer School of Neuroengineering, Genova, June 2018
- HBP School: The Brain Simulation Platform, Scientific Chair, Palermo, Italy, Sep. 2018
- HBP Colloquium, Forschungszentrum Jülich, Oct.2018
- Workshop “Mathematics for Biomedicine”, Accademia dei Lincei, Roma, Oct.2018
- The NEURON School, Alghero, Apr.2019
- Scuola Estiva SPAIS, Jul 2019
- School of Brain Cells & Circuits “Camillo Golgi”, Erice, Italy (2019)
- International Neuroinformatics Coordinating Facility School on the Brain Simulation Platform, Warsaw, Aug 2019
- Workshop on Mathematical Modeling, Naples University Federico II, Sep.2019
- HBP School: The Brain Simulation Platform, Scientific Chair, Helsinki, Sep. 2019
- Krembil Research Institute, Toronto, Canada, Nov.2019

- EBRAINS-Italy Kick-off meeting, Scientific Chair, Palermo, 2020
- EBRAINS Master Class, online event, July 2021
- Ion Channels and Neuronal Excitability School, Kotor, Montenegro, Sep.2021
- School of Brain Cells & Circuits “Camillo Golgi”, Erice, Italy (2021)
- EMBL, Rome, Feb.2022
- Symposium “From Cortical Circuits to Consciousness”, Paris, Apr. 2022
- EBRAINS School on Brain Simulation, Scientific Chair, Palermo, May. 2022
- EBRAINS School on Brain Simulation, Scientific Chair, Genova, May. 2023
- School of Brain Cells & Circuits “Camillo Golgi”, Erice, Italy (2024)
- School of Brain Cells & Circuits “Camillo Golgi”, Erice, Italy (2025)
- EBRAINS School on Brain Simulation, Scientific Chair, Brasov (Romania), May. 2025

### **Research Interests**

Over the past 40 years Michele Migliore has been involved in the development and implementation of computational models of complex systems. The initial research focus has been on Monte Carlo and Molecular Dynamics simulations of water-biomolecules interaction; the current scientific interests are focused on computational neuroscience, with the broad long-term goal to investigate, using realistic models and state of the art simulations techniques, the basic processes underlying the nervous system functions and dysfunctions. In close interdisciplinary collaboration with leading experimental laboratories, his lab has investigated neuronal networks and single neurons at different integration levels always closely related to the available experimental data. The primary current research interests are the mechanisms of learning and memory, synaptic integration, and ion channels function, in the attempt to link behavioral and dysfunctional processes with signal processing at the single neuron or network level.

## Most Recent External funding

### Scientific Coordination of Large Projects

|                                                                     |
|---------------------------------------------------------------------|
| Project <b>EBRAINS-Italy</b>                                        |
| Typology/financing <b>EU, Next generation EU</b>                    |
| Total funding amount <b>22,370,240 EUR</b>                          |
| Funding amount for MM-LAB <b>7,871,275 EUR</b>                      |
| Period of activity from 01 Nov 2022 to 30 Apr. 2026, <b>ongoing</b> |

### Task/WP or Co-Leadership

|                                                                    |
|--------------------------------------------------------------------|
| Project <b>HIPPOCOMP</b>                                           |
| Typology/financing <b>PRIN Italian Ministry for Research (MUR)</b> |
| Total funding amount <b>301,007 EUR</b>                            |
| Funding amount for MM-LAB <b>141,333 EUR</b>                       |
| Period of activity from 18 Oct 2023 to 31 Dic 2025, <b>ongoing</b> |
| Co-PI                                                              |

|                                                      |
|------------------------------------------------------|
| Project <b>Human Brain Project SGA3</b>              |
| Typology/financing <b>EU, FET Flagship</b>           |
| Total funding amount <b>150,000,000 EUR</b>          |
| Funding amount for MM-LAB <b>1,013,215 EUR</b>       |
| Period of activity from 01 April 2020 to 30 Sep 2023 |
| Task T5.2                                            |

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| Project <b>Multiscale Modeling of Impaired Learning in Alzheimer's Disease and Innovative Treatments (MILEDI)</b> |
| Typology/financing <b>Flag -ERA JTC 2019</b>                                                                      |
| Total funding amount <b>437,764.5 EUR</b>                                                                         |
| Funding amount for MM-LAB <b>138,240 EUR</b>                                                                      |
| Period of activity: from 01 April 2020 to 31 March 2023                                                           |
| Tasks T2.3, T3.1, T3.2, T3.3                                                                                      |

|                                                        |
|--------------------------------------------------------|
| Project <b>Human Brain Project SGA2</b>                |
| Typology/financing <b>EU, FET Flagship</b>             |
| Total funding amount <b>88,000,000 EUR</b>             |
| Funding amount for MM-LAB <b>670,780 EUR</b>           |
| Period of activity from 01 April 2018 to 31 March 2020 |
| Work Package WP6.4, T5.9.7                             |

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|--------------------------------------------------------------------------------------------------------------------|
| Project <b>Synaptic circuit protection in AD and HD: BDNF/ TrkB and Arc signaling as rescue factors (CIRCPROT)</b> |
| Type/financing <b>JPCOFUND</b>                                                                                     |
| Total funding amount <b>2,319,000 EUR</b>                                                                          |
| Funding amount for MM-LAB <b>173,060.65 EUR</b>                                                                    |
| Period of activity from 01 April 2016 to 31 March 2019                                                             |
| Work Package 5                                                                                                     |

## Task participant

|                                                        |
|--------------------------------------------------------|
| Project title <b>Human Brain Project SGA3</b>          |
| Typology/financing <b>EU, FET Flagship</b>             |
| Total funding amount 150 million EUR                   |
| Total funding amount for MM-LAB <b>1,199,175 EUR</b>   |
| Period of activity from 01 April 2020 to 31 March 2023 |
| Tasks T1.5, T1.6, T3.2, T4.13, T4.14                   |

|                                                                    |
|--------------------------------------------------------------------|
| Project title <b>EBRAINS 2.0</b>                                   |
| Typology/financing <b>EU, Horizon Europe</b>                       |
| Total funding amount 38 million EUR                                |
| Total funding amount for MM-LAB <b>495,568 EUR</b>                 |
| Period of activity from 01 Jan 2024 to 31 Dec 2026, <b>ongoing</b> |
| Tasks T3.1, T3.2                                                   |

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|--------------------------------------------------------|
| Project title <b>Human Brain Project SGA2</b>          |
| Typology/financing <b>EU, FET Flagship</b>             |
| Total funding amount <b>88,000,000 EUR</b>             |
| Funding amount for MM-LAB <b>271,358.4 EUR</b>         |
| Period of activity from 01 April 2018 to 31 March 2020 |
| T1.1.1, T6.1.1, T6.2.3, T6.5.2                         |

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|--------------------------------------------------------|
| Project title <b>Human Brain Project SGA1</b>          |
| Typology/financing <b>EU, FET Flagship</b>             |
| Total funding amount <b>89,000,000 EUR</b>             |
| Financing amount for MM-LAB <b>289,500 EUR</b>         |
| Period of activity from 01 April 2016 to 31 March 2018 |
| Work Package 6.4                                       |

|                                                        |
|--------------------------------------------------------|
| Project title <b>Human Brain Project SGA3</b>          |
| Typology/financing <b>EU, FET Flagship</b>             |
| Total funding amount <b>89,000,000 EUR</b>             |
| Funding amount for MM-LAB <b>268.038 EUR</b>           |
| Period of activity from 01 April 2016 to 31 March 2018 |
| Tasks T1.1.4, T6.2.4, T11.4.1                          |

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|--------------------------------------------------------|
| Project title <b>Human Brain Project SGA2</b>          |
| Typology/financing <b>EU, FET Flagship</b>             |
| Total funding amount <b>55,215,200 EUR</b>             |
| Funding amount for MM-LAB <b>81.858 EUR</b>            |
| Period of activity from 01 April 2016 to 31 March 2018 |
| Tasks T1.1.4, T6.2.4, T11.4.1                          |



**Michele Migliore - Publications on International ISI Journals (Oct 2025)**  
**9824 citations, h-index 51, i-10 index 112 (font: Google Scholar)**

1. Manara E, Mele A, Migliore M. In silico investigation of the puzzling dopamine effects on excitability and synaptic plasticity in hippocampal CA1 pyramidal neurons. *Sci Rep*. 2025 Sep 25;15(1):32822. doi: 10.1038/s41598-025-17694-8.
2. Romani A, Antonietti A, Bella D, Budd J, Giacalone E, Kurban K, Sáray S, Abdellah M, Arnaudon A, Boci E, Colangelo C, Courcol JD, Delemontex T, Ecker A, Falck J, Favreau C, Gevaert M, Hernando JB, Herttuainen J, Ivaska G, Kanari L, Kaufmann AK, King JG, Kumbhar P, Lange S, Lu H, Lupascu CA, Migliore R, Petitjean F, Planas J, Rai P, Ramaswamy S, Reimann MW, Riquelme JL, Román Guerrero N, Shi Y, Sood V, Sy MF, Van Geit W, Vanherpe L, Freund TF, Mercer A, Muller E, Schürmann F, Thomson AM, Migliore M, Káli S, Markram H. Community-based reconstruction and simulation of a full-scale model of the rat hippocampus CA1 region. *PLoS Biol*. 2024 Nov 5;22(11):e3002861. doi: 10.1371/journal.pbio.3002861.
3. Fiasconaro A, Migliore M. Hippocampal synchronization in a realistic CA1 neuron model (2024). *Phys Rev E*. 110(4-1):044406. doi: 10.1103/PhysRevE.110.044406.
4. Fiasconaro A, Migliore M, (2024) Effects of synapse location, delay and background stochastic activity on synchronising hippocampal CA1. *Chaos, Solitons & Fractals*: X, 13:100122, <https://doi.org/10.1016/j.csf.2024.100122>
5. Salvador Dura-Bernal, Beatriz Herrera, Carmen Lupascu, Brianna M. Marsh, Daniela Gandolfi, Addolorata Marasco, Samuel Neymotin, Armando Romani, Sergio Solinas, Maxim Bazhenov, Etay Hay, Michele Migliore, Michael Reinmann, Anton Arkhipov. (2024) Large-Scale Mechanistic Models of Brain Circuits with Biophysically and Morphologically Detailed Neurons, *Journal of Neuroscience* 44:e1236242024; DOI: 10.1523/JNEUROSCI.1236-24.2024
6. Tesler F, Lorenzi RM, Ponzi A, Casellato C, Palesi F, Gandolfi D, Gandini Wheeler Kingshott CAM, Mapelli J, D'Angelo E, Migliore M, Destexhe A. Multiscale modeling of neuronal dynamics in hippocampus CA1. *Front Comput Neurosci*. 2024 Aug 6;18:1432593. doi: 10.3389/fncom.2024.1432593
7. Blömer LA, Giacalone E, Abbas F, Filipis L, Tegolo D, Migliore M, Canepari M. (2024) Kinetics and functional consequences of BK channels activation by N-type  $Ca^{2+}$  channels in the dendrite of mouse neocortical layer-5 pyramidal neurons. *Front Cell Neurosci*. 18:1353895. doi: 10.3389/fncel.2024.1353895.
8. Marasco A, Tribuzi C, Iuorio A, Migliore M. (2024) Mathematical generation of data-driven hippocampal CA1 pyramidal neurons and interneurons copies via A-GLIF models for large-scale networks covering the experimental variability range. *Math Biosci*. 371:109179. doi: 10.1016/j.mbs.2024.109179.
9. Marasco A, Tribuzi C, Lupascu CA, Migliore M. (2024) Modeling realistic synaptic inputs of CA1 hippocampal pyramidal neurons and interneurons via Adaptive Generalized Leaky Integrate-and-Fire models. *Math Biosci*. 372:109192. doi: 10.1016/j.mbs.2024.109192.
10. Vitale Paola, Librizzi Fabio, Vaiana Andrea C., Capuana Elisa, Pezzoli Maurizio, Shi Ying, Romani Armando, Migliore Michele, Migliore Rosanna, (2023) Different responses of mice and rats hippocampus CA1 pyramidal neurons to in vitro and in vivo-like inputs, *Frontiers in Cellular Neuroscience* 17, DOI 10.3389/fncel.2023.1281932
11. Dainauskas Justinas J., Vitale Paola, Moreno Sebastien, Marie Hélène, Migliore Michele, Saudargiene Ausra, (2023) Altered synaptic plasticity at hippocampal CA1–CA3 synapses in Alzheimer's disease: integration of amyloid precursor protein intracellular domain and

- amyloid beta effects into computational models, *Frontiers in Computational Neuroscience* 17, DOI 10.3389/fncom.2023.1305169
12. Mazzara C, Migliore M. A realistic computational model for the formation of a Place Cell. *Sci Rep.* 2023 Dec 8;13(1):21763. doi: 10.1038/s41598-023-48183-5.
  13. Bologna LL, Tocco A, Smiriglia R, Romani A, Schürmann Fx, Migliore M. (2023) Online interoperable resources for building hippocampal neuron models via the Hippocampus Hub, *Frontiers in Neuroinformatics* 17, doi: 10.3389/fninf.2023.1271059.
  14. Centofante E, Fralleoni L, Lupascu CA, Migliore M, Rinaldi A, Mele A. Specific patterns of neural activity in the hippocampus after massed or distributed spatial training. *Sci Rep.* 2023 Aug 16;13(1):13357. doi: 10.1038/s41598-023-39882-0
  15. Marasco A, Spera E, De Falco V, Iuorio A, Lupascu CA, Solinas S, Migliore M. An Adaptive Generalized Leaky Integrate-and-Fire Model for Hippocampal CA1 Pyramidal Neurons and Interneurons. *Bull Math Biol.* 2023 Oct 4;85(11):109. doi: 10.1007/s11538-023-01206-8
  16. Topczewska A, Giacalone E, Pratt WS, Migliore M, Dolphin AC, Shah MM. T-type  $\text{Ca}^{2+}$  and persistent  $\text{Na}^{+}$  currents synergistically elevate ventral, not dorsal, entorhinal cortical stellate cell excitability. *Cell Rep.* 2023 Jul 25;42(7):112699. doi: 10.1016/j.celrep.2023.112699
  17. Giacomelli G, Migliore M, Tegolo D. NeuronAlg: An Innovative Neuronal Computational Model for Immunofluorescence Image Segmentation. *Sensors (Basel).* 2023 May 9;23(10):4598. doi: 10.3390/s23104598
  18. Dainauskas JJ, Marie H, Migliore M, Saudargiene A. GluN2B-NMDAR subunit contribution on synaptic plasticity: A phenomenological model for CA3-CA1 synapses. *Front Synaptic Neurosci.* 2023 Mar 15;15:1113957. doi: 10.3389/fnsyn.2023.1113957
  19. Appukuttan S, Bologna LL, Schürmann F, Migliore M, Davison AP. EBRAINS Live Papers - Interactive Resource Sheets for Computational Studies in Neuroscience. *Neuroinformatics.* 2023 Jan;21(1):101-113. doi: 10.1007/s12021-022-09598-z.
  20. Ponzi A, Dura-Bernal S, Migliore M. Theta-gamma phase amplitude coupling in a hippocampal CA1 microcircuit. *PLoS Comput Biol.* 2023 19(3):e1010942. doi: 10.1371/journal.pcbi.1010942
  21. Daniela Gandolfi, and Michele Migliore. A single-cell-resolution mathematical model of the CA1 human hippocampus. *Nature Comput Sci* 3, 196–197 (2023). doi.org/10.1038/s43588-023-00421-6
  22. Gandolfi, D., Mapelli, J., Solinas, S.M.G. *et al.* Full-scale scaffold model of the human hippocampus CA1 area. *Nature Comput Sci* 3, 264–276 (2023). <https://doi.org/10.1038/s43588-023-00417-2>
  23. Coppolino S, Migliore M. An explainable artificial intelligence approach to spatial navigation based on hippocampal circuitry. *Neural Netw.* 2023 Mar 30;163:97-107. doi: 10.1016/j.neunet.2023.03.030
  24. Romani A, Schürmann F, Markram H, Migliore M. Reconstruction of the Hippocampus. *Adv Exp Med Biol.* 2022;1359:261-283
  25. Amunts K, DeFelipe J, Pennartz C, Destexhe A, Migliore M, Rylvlin P, Furber S, Knoll A, Bitsch L, Bjaalie JG, Ioannidis Y, Lippert T, Sanchez-Vives MV, Goebel R, Jirsa V. Linking Brain Structure, Activity, and Cognitive Function through Computation. *eNeuro.* 2022 Mar 11;9(2):ENEURO.0316-21.2022. doi: 10.1523/ENEURO.0316-21.2022
  26. Bianchi D, Migliore R, Vitale P, Garad M, Pousinha PA, Marie H, Lessmann V, Migliore M. Membrane electrical properties of mouse hippocampal CA1 pyramidal neurons during strong inputs. *Biophys J.* 2022 Feb 15;121(4):644-657. doi: 10.1016/j.bpj.2022.01.002
  27. Gandolfi D, Mapelli J, Solinas S, De Schepper R, Geminiani A, Casellato C, D'Angelo E, Migliore M. A realistic morpho-anatomical connection strategy for modelling full-scale

- point-neuron microcircuits. *Sci Rep.* 2022 Aug 16;12(1):13864. doi: 10.1038/s41598-022-18024-y
28. Coppolino, S., Giacomelli, G., Migliore, M. (2021) Sequence Learning in a Single Trial: A Spiking Neurons Model Based on Hippocampal Circuitry, *IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS*, in press. doi: 10.1109/TNNLS.2021.3049281
  29. Giacomelli, G., Spera E., Tegolo, D., Migliore, M. (2021), On the structural connectivity of large-scale models of brain networks at cellular level, *Nature Scientific Reports*, 11, 4345 (2021). <https://doi.org/10.1038/s41598-021-83759-z>.
  30. Giacomelli G, Tegolo D, Migliore M. The role of network connectivity on epileptiform activity. *Sci Rep.* 2021 Oct 21;11(1):20792. doi: 10.1038/s41598-021-00283-w.
  31. Giacomelli, G., Migliore, M., Tegolo, D. (2020). Graph-theoretical Derivation of Brain Structural Connectivity. *Appl. Mat. Comput.* 377, 125150
  32. Shepherd GM, Hines ML, Migliore M, Chen WR, Greer CA. Predicting brain organization with a computational model: 50-year perspective on lateral inhibition and oscillatory gating by dendrodendritic synapses. *J Neurophysiol.* 2020 Aug 1;124(2):375-387. doi: 10.1152/jn.00175.2020.
  33. McCauley JP, Petroccione MA, D'Brant LY, Todd GC, Affinnih N, Wisnoski JJ, Zahid S, Shree S, Sousa AA, De Guzman RM, Migliore R, Brazhe A, Leapman RD, Khmaladze A, Semyanov A, Zuloaga DG, Migliore M, Scimemi A. Circadian Modulation of Neurons and Astrocytes Controls Synaptic Plasticity in Hippocampal Area CA1. *Cell Rep.* 2020 Oct 13;33(2):108255. doi: 10.1016/j.celrep.2020.108255.
  34. Lupascu CA, Morabito A, Ruggeri F, Parisi C, Pimpinella D, Pizzarelli R, Meli G, Marinelli S, Cherubini E, Cattaneo A, Migliore M. (2020) Computational Modeling of Inhibitory Transsynaptic Signaling in Hippocampal and Cortical Neurons Expressing Intrabodies Against Gephyrin, *Front Cell Neurosci.* 14:173.
  35. Ecker A, Romani A, Sáray S, Káli S, Migliore M, Falck J, Lange S, Mercer A, Thomson AM, Muller E, Reimann MW, Ramaswamy S. Data-driven integration of hippocampal CA1 synaptic physiology in silico. *Hippocampus.* 2020 Nov;30(11):1129-1145. doi: 10.1002/hipo.23220.
  36. Pousinha PA, Mouska X, Bianchi D, Temido-Ferreira M, Rajão-Saraiva J, Gomes R, Fernandez SP, Salgueiro-Pereira AR, Gandin C, Raymond EF, Barik J, Goutagny R, Bethus I, Lopes LV, Migliore M, Marie H (2019) The Amyloid Precursor Protein C-Terminal Domain Alters CA1 Neuron Firing, Modifying Hippocampus Oscillations and Impairing Spatial Memory Encoding, *Cell Rep.* 29(2):317-331.e5. doi: 10.1016/j.celrep.2019.08.103
  37. Einevoll GT, Destexhe A, Diesmann M, Grün S, Jirsa V, de Kamps M, Migliore M, Ness TV, Plesser HE, Schürmann F. (2019) The Scientific Case for Brain Simulations, *Neuron.* 102(4):735-744. doi: 10.1016/j.neuron.2019.03.027.
  38. Solinas SMG, Edelmann E, Leßmann V, Migliore M (2019) A kinetic model for Brain-Derived Neurotrophic Factor mediated spike timing-dependent LTP. *PLoS Comput Biol* 15(4): e1006975.
  39. Katiushcia Martinello, Elisabetta Giacalone, Michele Migliore, David A. Brown and Mala M. Shah, (2019), The subthreshold-active KV7 current limits spike-induced Ca<sup>2+</sup> influx in hippocampal mossy fiber synaptic terminals to regulate neurotransmission., *Nature Communications Biology* 2: 145.
  40. Shepherd GM, Marenco L, Hines ML, Migliore M, McDougal RA, Carnevale NT, Newton AJH, Surles-Ziegler M and Ascoli GA (2019), Neuron Names: A Gene and Property-Based Name Format, With Special Reference to Cortical Neurons. *Front. Neuroanat.* 13:25. doi: 10.3389/fnana.2019.00025
  41. Migliore R, Lupascu CA, Bologna LL, Romani A, Courcol JD, Antonel S, Van Geit WAH, Thomson AM, Mercer A, Lange S, Falck J, Rössert CA, Shi Y, Hagens O, Pezzoli M, Freund TF, Káli S, Muller EB, Schürmann F, Markram H, Migliore M. (2018), The physiological variability of channel density in hippocampal CA1 pyramidal cells and interneurons explored using a unified data-driven modeling workflow, *PLoS Comp. Biol.*, 14(9):e1006423. doi: 10.1371/journal.pcbi.1006423
  42. Cavarretta F, Burton SD, Igarashi KM, Shepherd GM, Hines ML, Migliore M., (2018) Parallel odor processing by mitral and middle tufted cells in the olfactory bulb, *Nature Sci Rep.* 16;8:7625. doi: 10.1038/s41598-018-25740-x

43. Neymotin SA, Suter BA, Dura-Bernal S, Shepherd GM, Migliore M, Lytton WW, J (2017) Optimizing computer models of corticospinal neurons to replicate in vitro dynamics J. Neurophysiol. 117(1):148-162. doi: 10.1152/jn.00570.2016.
44. McDougal RA, Morse TM, Carnevale T, Marengo L, Wang R, Migliore M, Miller PL, Shepherd GM, Hines ML (2017) Twenty years of ModelDB and beyond: building essential modeling tools for the future of neuroscience J. Comput. Neurosci. 42(1):1-10. doi: 10.1007/s10827-016-0623-7. Epub 2016 Sep 15
45. V Breton-Provencher, K Bakhshetyan, D Hardy, R Bammann, F Cavarretta, M Snappyan, D Coté, M Migliore, and A Saghatelian (2016) Principal cell activity induces spine relocation of adult-born interneurons in the olfactory bulb, Nature Comm, 7:12659. doi: 10.1038/ncomms12659.
46. Cellot G, Maggi L, Di Castro MA, Catalano M, Migliore R, Migliore M, Scattoni ML, Calamandrei G, Cherubini E. (2016) Premature changes in neuronal excitability account for hippocampal network impairment and autistic-like behavior in neonatal BTBR T+tf/J mice, Nature Sci Rep. 6:31696; doi: 10.1038/srep31696
47. [Cavarretta F](#), [Marasco A](#), [Hines ML](#), [Shepherd GM](#) and [Migliore M](#) (2016), [Glomerular and mitral-granule cell microcircuits coordinate temporal and spatial information processing in the olfactory bulb](#), Front Comput Neurosci. 10:67; doi: 10.3389/fncom.2016.00067
48. Lupascu CA, Morabito A, Merenda E, Marinelli S, Marchetti C, Migliore R, Cherubini E and Migliore M (2016) A General Procedure to Study Subcellular Models of Transsynaptic Signaling at Inhibitory Synapses. Front. Neuroinform. 10:23. doi: 10.3389/fninf.2016.00023
49. Migliore R, De Simone G, Leinekugel X, Migliore M, (2016) The possible consequences for cognitive functions of external electric fields at power line frequency on hippocampal CA1 pyramidal neurons, Eur. J. Neurosci, doi: 10.1111/ejn.13325.
50. A Marasco, A De Paris, M Migliore, (2016) Predicting the response of olfactory sensory neurons to odor mixtures from single odor response, Nature Sci Rep. 6:24091.
51. Spera E, Migliore M, Unsworth D, Tegolo D, (2016) On the cellular mechanisms underlying working memory capacity in humans, Neural Network World 4:335-350. DOI: 10.14311/NNW.2016.26.019
52. Zhou S, Migliore M, Yu Y (2016) Odor experience facilitates the sparse coding of new odors in a large-scale olfactory bulb model, Front. Neuroanat. 10:10. doi: 10.3389/fnana.2016.00010
53. Enrico P, Migliore M, Spiga S, Mulas G, Caboni F, Diana M. (2016) Morphofunctional alterations in ventral tegmental area dopamine neurons in acute and prolonged opiates withdrawal. A computational perspective, Neuroscience. 17;322:195-207
54. Migliore M, Cavarretta F, Marasco A, Tulumello E, Hines ML, Shepherd GM. (2015) Synaptic clusters function as odor operators in the olfactory bulb, Proc Natl Acad Sci U S A. 2015 Jul 7;112(27):8499-504.
55. Migliore M, De Simone G, Migliore R. (2015) Effect of the initial synaptic state on the probability to induce long-term potentiation and depression, Biophys J. 108(5):1038-46.
56. Miceli F, Soldovieri MV, Ambrosino P, De Maria M, Migliore M, Migliore R, Taglialatela M. (2015) Early-Onset Epileptic Encephalopathy Caused by Gain-of-Function Mutations in the Voltage Sensor of Kv7.2 and Kv7.3 Potassium Channel Subunits, J. Neurosci. 35(9):3782-93.
57. Migliore M., McTavish T. (2015) Olfactory Computation in Mitral-Granule Cell Circuits. In: Jaeger D., Jung R. (Ed.) Encyclopedia of Computational Neuroscience: SpringerReference ([www.springerreference.com](http://www.springerreference.com)). Springer New York, pp 2139-2142, DOI: 10.1007/978-1-4614-6675-8\_615, ISBN 978-1-4614-6674-1.
58. Shepherd, GordonM. and Morse, ThomasM. and Marengo, Luis and Cheung, Kei and Carnevale, Ted and Migliore, Michele and McDougal, RobertA. and Hines, Michael and Miller, Perry (2015) SenseLab: Integration of Multidisciplinary Neuroscience Data, in: Jaeger D., Jung R. (Ed.) Encyclopedia of Computational Neuroscience: SpringerReference ([www.springerreference.com](http://www.springerreference.com)). Springer New York, pp 2655-2657, DOI: 10.1007/978-1-4614-6675-8\_497, ISBN 978-1-4614-6674-1.
59. Marasco A, Migliore M, (2015) Reduced Morphology Models. In: Jaeger D., Jung R. (Ed.) Encyclopedia of Computational Neuroscience: SpringerReference ([www.springerreference.com](http://www.springerreference.com)). Springer New York, pp 2598-2610, DOI 10.1007/978-1-4614-6675-8\_245; ISBN 978-1-4614-6674-1

60. Gasparini S., Migliore M. (2015) Action Potential Back-Propagation. In: Jaeger D., Jung R. (Ed.) *Encyclopedia of Computational Neuroscience*: SpringerReference (www.springerreference.com), Springer New York, pp 133-137, DOI 10.1007/978-1-4614-6675-8\_123; ISBN 978-1-4614-6674-1.
61. McDougal, Robert A, Wang, Rixin, Morse, Thomas M, Migliore, Michele, Marengo, Luis, Carnevale, Ted, Hines, Michael, and Shepherd, Gordon M. (2015) ModelDB, In: Jaeger D., Jung R. (Ed.) *Encyclopedia of Computational Neuroscience*: SpringerReference (www.springerreference.com), Springer New York, pp 1727-1730, 10.1007/978-1-4614-6675-8\_158; ISBN 978-1-4614-6674-1.
62. Cavarretta F, Carnevale NT, Tegolo D and Migliore M (2014) Effects of low frequency electric fields on synaptic integration in hippocampal CA1 pyramidal neurons: implications for power line emissions. *Front. Cell. Neurosci.* 8:310
63. Yu Y, Migliore M, Hines ML, Shepherd GM (2014) Sparse coding and lateral inhibition arising from balanced and unbalanced dendrodendritic excitation and inhibition, *J. Neurosci.* 34: 13701-13713.
64. Casaleggio A, Hines ML, Migliore M. (2014) Computational model of erratic arrhythmias in a cardiac cell network: the role of gap junctions *PLoS One.* 9:e100288.
65. Migliore M, Cavarretta F, Hines ML, Shepherd GM. (2014) Distributed organization of a brain microcircuit analyzed by three-dimensional modeling: the olfactory bulb, *Front Comput Neurosci.* 8:50.
66. Bianchi D, De Michele PD, Marchetti C, Tirozzi B, Cuomo S, Marie H, Migliore M (2014), Effects of increasing CREB-dependent transcription on the storage and recall processes in a hippocampal CA1 microcircuit, *Hippocampus.* 24:165-77.
67. Migliore M, Cavarretta F, Hines ML, Shepherd GM. (2013) Functional neurology of a brain system: a 3D olfactory bulb model to process natural odorants. *Funct. Neurol.* 28:241-3
68. Marasco A, Limongiello A, Migliore M (2013) Using Strahler's analysis to reduce up to 200-fold the run time of realistic neuron models, *Nature Sci Rep.* 3:2934
69. Yu Y, McTavish TS, Hines ML, Shepherd GM, Valenti C, Migliore M. (2013) Sparse Distributed Representation of Odors in a Large-scale Olfactory Bulb Circuit, *PLoS Comput Biol.* 9(3):e1003014.
70. F Miceli, MV Soldovieri, P Ambrosino, M Migliore, MR Cilio, and M Tagliatela, (2013) Genotype-phenotype correlations in neonatal epilepsies caused by mutations in the voltage sensor of Kv7.2 potassium channel subunits, *Proc. Nat. Acad. Sci. USA,* 110:4386-91.
71. Ferrante M, Migliore M, Ascoli GA (2013) Functional impact of dendritic branch point morphology, *J. Neurosci.,* 33:2156-2165.
72. Romani A, Marchetti C, Bianchi D, Leinekugel X, Poirazi P, Migliore M, Marie H (2013) Computational modeling of the effects of amyloid-beta on release probability at hippocampal synapses, *Front. Comput. Neurosci.,* 7:1.
73. Tigerholm J, Migliore M, Fransén E. (2013) Integration of synchronous synaptic input in CA1 pyramidal neuron depends on spatial and temporal distributions of the input. *Hippocampus,* 23:87-99
74. Suter BA, Migliore M, Shepherd GM. (2013), Intrinsic Electrophysiology of Mouse Corticospinal Neurons: a Class-Specific Triad of Spike-Related Properties, *Cereb Cortex.* 23:1965-77.
75. Marasco A, Limongiello A, Migliore M. (2012) Fast and accurate low-dimensional reduction of biophysically detailed neuron models, *Nature Sci Rep.* 2012;2:928.
76. Culmone V, Migliore M (2012) Progressive effect of beta amyloid peptides accumulation on CA1 pyramidal neurons: a model study suggesting possible treatments. *Front. Comput. Neurosci.* 6:52. doi: 10.3389/fncom.2012.00052
77. Migliore M, Migliore R. (2012) Know your current Ih: interaction with a shunting current explains the puzzling effects of its pharmacological or pathological modulations, *PLoS One.* 2012;7(5):e36867.
78. Marcelin B, Liu Z, Chen Y, Lewis AS, Becker A, McClelland S, Chetkovich DM, Migliore M, Baram TZ, Esclapez M, Bernard C. (2012) Dorsal-ventral differences in intrinsic properties in developing CA1 pyramidal cells, *J. Neurosci.,* 32:3736-3747.

79. Bianchi D, Marasco A, Limongiello A, Marchetti C, Marie H, Tirozzi B, Migliore M, (2012) On the mechanisms underlying the depolarization block in the spiking dynamics of CA1 pyramidal neurons, *J. Comp. Neurosci.* 33:207-225.
80. Mctavish TS, Migliore M, Shepherd GM and Hines ML (2012) Mitral cell spike synchrony modulated by dendrodendritic synapse location *Front. Comput. Neurosci.* 6:3
81. Mala M Shah, Michele Migliore, and David A. Brown, (2011) Differential effects of Kv7 (M-) channels on synaptic integration in distinct subcellular compartments of rat hippocampal pyramidal neurons, *J. Physiol.* 589:6029-38.
82. Halnes G, Augustinaite S, Heggelund P, Einevoll GT, Migliore M (2011) A Multi-Compartment Model for Interneurons in the Dorsal Lateral Geniculate Nucleus *PLoS Comp. Biol.* 7:e1002160.
83. Migliore M, De Blasi I, Tegolo D, Migliore R (2011) A modeling study suggesting how a reduction in the context-dependent input on CA1 pyramidal neurons could generate schizophrenic behavior, *Neural Networks*, 24:552-559.
84. Migliore M, Hines ML, McTavish TS, Shepherd GM. (2010) Functional roles of distributed synaptic clusters in the mitral-granule cell network of the olfactory bulb. *Front. Integr. Neurosci.* 4:122.
85. J.L. Baker, T. Perez-Rosello, M. Migliore, G. Barrionuevo, G.A. Ascoli. (2010) A computer model of unitary responses from associational/commissural and perforant path synapses in hippocampal CA3 pyramidal cells. *J. Comput. Neurosci.*, 31:137-58.
86. Morse TM, Carnevale NT, Mutalik PG, Migliore M and Shepherd GM (2010) Abnormal excitability of oblique dendrites implicated in early Alzheimer's: a computational study. *Front. Neural Circuits* 4:16.
87. Gordon M. Shepherd, Michele Migliore, and David C. Willhite, *The Olfactory Bulb*, in *Handbook of Brain Microcircuits*, ch.24, G. Shepherd and S. Grillner. Eds, Oxford University Press, (2010). ISBN 9780195389883
88. G. Ascoli, S. Gasparini, V. Medinilla, and M. Migliore. Local Control of Post-Inhibitory Rebound Spiking in CA1 Pyramidal Neuron Dendrites, *J. Neurosci.*, 30: 6422-6433 (2010).
89. S. Spiga, A. Lintas, M. Migliore and M. Diana. Altered architecture and functional consequences of the mesolimbic dopamine system in cannabis dependence: pre and post synaptic elements, *Addiction Biology*, 15:266-76 (2010).
90. Victoria F. Safiulina, Maddalena D. Caiati, Sudhir Sivakumaran, Giacomo Bisson, Michele Migliore, Enrico Cherubini. Control of GABA release at single mossy fiber-CA3 connections in the developing hippocampus, *Front. Syn. Neurosci.*, 2:1 doi:10.3389/neuro.19.001.2010 (2010).
91. M Migliore, DB Jaffe, GA Ascoli. CA3 Cells: detailed and simplified pyramidal cells models, in *Hippocampal Microcircuits*, ch.12, Springer Series in Computational Neuroscience, ISBN 978-1-4419-0995-4, (2010).
92. M. Ferrante, M. Migliore, G.A. Ascoli. Feed-forward inhibition as a buffer of the neuronal input-output relation. *Proc. Natl. Acad. Sci. USA*, 106:18004-18009 (2009).
93. F. Miceli, M.V. Soldovieri, L. Lugli, G. Bellini, P. Ambrosino, M. Migliore, E. Miraglia Del Giudice, F. Ferrari, A. Pascotto, M. Taglialatela, Neutralization Of a Unique, Negatively-charged Residue in the Voltage Sensor of KV7.2 Subunits in a Sporadic Case of Benign Familial Neonatal Seizures, *Neurobiol. Dis.*, 34:501-510 (2009).
94. Peter Hemond, Michele Migliore, Giorgio A. Ascoli, and David B. Jaffe, The membrane response of hippocampal CA3b pyramidal neurons near rest: heterogeneity of passive properties and the contribution of hyperpolarization-activated currents, *Neuroscience*, 160:359-370 (2009).
95. Béatrice Marcelin, Laëtitia Chauvière, Albert Becker, Michele Migliore, Monique Esclapez, Christophe Bernard, h channel-dependent deficit of theta oscillation resonance and phase shift in temporal lobe epilepsy, *Neurobiol. Dis.*, 33:436-47 (2009).
96. Migliore M, Novara G, Tegolo D (2008) Single neuron binding properties and the magical number 7, *Hippocampus* 18:1122-1130.
97. Ferrante M, Blackwell KT, Migliore M, Ascoli GA (2008), Computational models of neuronal biophysics and the characterization of potential neuropharmacological targets, *Current Medicinal Chemistry* 15:2456-2471.



98. Mala M. Shah, Michele Migliore, Ignacio Valencia, Edward C. Cooper and David A. Brown, Functional Significance of Axonal Kv7 channels in Hippocampal Pyramidal Neurons, *Proc. Nat. Acad. Sci. USA*, 105:7869-7874 (2008).
99. Migliore M, Cannia, C, Canavier CC, A modeling study suggesting a possible pharmacological target to mitigate the effects of ethanol on reward-related dopaminergic signaling. *J Neurophysiol.*, 99:2703-2707 (2008).
100. Peter Hemond, Daniel Epstein, Angela Boley, Michele Migliore, Giorgio A. Ascoli, and David B. Jaffe, Distinct classes of pyramidal cells exhibit mutually exclusive firing patterns in hippocampal area CA3b, *Hippocampus*, 18:411-424 (2008).
101. Cassarà AM, Hagberg GE, Bianciardi M, Migliore M, and Maraviglia B. Realistic Simulations of Neuronal Activity: A Contribution to the Debate on Direct Detection of Neuronal-currents by MRI, *Neuroimage*, 39:87-106 (2008).
102. Migliore M, Shepherd, Gordon M, Dendritic action potentials connect distributed dendrodendritic microcircuits. *J. Comput. Neurosci.*, 24:207-221 (2008).
103. M. Migliore, Carlo Inzirillo and Gordon M. Shepherd, [Learning mechanism for column formation in the olfactory bulb](#), *Front. Int. Neurosci.* 1:12 (2007).
104. Chiquito J. Crasto, Luis N. Marengo, Nian Liu, Thomas M. Morse, Kei-Hoi Cheung, Peter C. Lai, Gautam Bahl, Peter Masiar, Hugo Y.K. Lam, Ernest Lim, Huajin Chen, Prakash Nadkarni, Michele Migliore, Perry L. Miller, Gordon M. Shepherd, SenseLab: new developments in disseminating neuroscience information, *Briefings in Bioinformatics*, 8:150-162 (2007).
105. F. Minneci, M. Janahmadi, M. Migliore, N. Dragicevic, E. Cherubini, Signaling properties of stratum oriens interneurons in the hippocampus of transgenic mice expressing EGFP in a subset of somatostatin-containing cells, *Hippocampus*, 17:538-553 (2007).
106. Shepherd GM, Chen WR, Willhite D, Migliore M, Greer CA, The olfactory granule cell: From classical enigma to central role in olfactory processing, *Brain Res. Rev.* 55:373-382 (2007).
107. R. Bartsaghi, M. Migliore, T. Gessi, Input-Output relations in the Entorhinal cortex-Hippocampal system: evidence for a non-linear transfer of signals, *Neuroscience*, 142:247-265 (2006).
108. M. Migliore, C. Cannia, W.W Lytton, Henry Markram, and M. L. Hines, Parallel Network simulations with NEURON, *J. Comp. Neurosci.* 21:119-129 (2006).
109. R. Shimazaki, A. Boccaccio, A. Mazzatenta, G. Pinato, M. Migliore, A. Menini, Electrophysiological properties and modeling of murine vomeronasal sensory neurons in acute slice preparations, *Chem. Senses*, 31:425-435 (2006).
110. Migliore M, Ferrante M, Ascoli GA, Signal propagation in oblique dendrites of CA1 pyramidal cells, *J. Neurophysiol.*, 94:4145-55 (2005).
111. Migliore M., and Shepherd, Gordon M. An integrated approach to classifying neuronal phenotypes, *Nature Rev. Neuroscience* 6:810-18 (2005).
112. Saghatelian A, Roux P, Migliore M, Rochefort C, Desmaisons D, Charneau P, Shepherd GM, and Lledo P-M, Activity-Dependent Adjustments of the Inhibitory Network in the Adult Olfactory Bulb Following Early Postnatal Deprivation, *Neuron* 46:103-116 (2005).
113. M Migliore, ML Hines, and Gordon M Shepherd, The role of distal dendritic gap junctions in synchronization of mitral cell axonal output, *J. Comput. Neurosci.* 18:151-161 (2005).
114. Gasparini S, Migliore M, Magee JC (2004) On the initiation and propagation of dendritic spikes in CA1 pyramidal neurons, *J. Neurosci.* 24:11046-11056.
115. ML Hines, TM Morse, M. Migliore, NT Carnevale, and GM Shepherd, ModelDB: a database to support computational neuroscience, *J. Comput. Neurosci.* 17, 7-11 (2004).
116. M. Migliore, L. Messineo, M. Ferrante, Dendritic I<sub>h</sub> selectively blocks temporal summation of unsynchronized distal inputs in CA1 pyramidal neurons, *J. Comput. Neurosci.* 16, 5-13 (2004).
117. AP Davison, TM Morse, M Migliore, GM Shepherd, ML Hines, (2004) Semi-automated population of an online database of neuronal models (ModelDB) with citation information, using PubMed for validation, *Neuroinformatics* 2, 327-332
118. Chiquito J. Crasto, Luis Marengo, Michele Migliore, Buqing Mao, Prakash M. Nadkarni, Perry Miller and Gordon M. Shepherd. Text Mining Neuroscience Journal Articles to Populate Neuroscience Databases, *Neuroinformatics*, 3, 215-238 (2003).

119. Frick, J. Magee, H.J. Koester, M. Migliore, and D. Johnston, Normalization of Ca<sup>2+</sup> signals by small oblique dendrites of CA1 pyramidal neurons, *J. Neurosci.*, 23, 3243-3250 (2003).
120. M. Migliore, On the integration of subthreshold inputs from Perforant Path and Schaffer collaterals in hippocampal CA1 neurons, *J. Comput. Neurosci.* 14, 185-192 (2003).
121. M. Migliore, TM Morse, AP Davison, L Marenco, GM Shepherd and ML Hines, ModelDB: making models publicly accessible to support computational neuroscience, *Neuroinformatics* 1, 135-140 (2003).
122. N.P. Poolos, M. Migliore, and D. Johnston, Pharmacological upregulation of h-channels selectively reduces the excitability of pyramidal neuron dendrites, *Nature Neurosci.* 5, 767-774 (2002).
123. S. Watanabe, DA Hoffman, M. Migliore, and D. Johnston, Dendritic K<sup>+</sup> channels contribute to spike-timing dependent long-term potentiation in hippocampal pyramidal neurons, *Proc. Natl. Acad. Sci. USA* 99, 8366-8371 (2002).
124. M.T. Lazarewicz, M. Migliore, G.A. Ascoli, A new bursting model of CA3 pyramidal cell physiology suggests multiple locations for spike initiation, *Biosystems* 67, 129-137 (2002).
125. M. Migliore and Gordon M. Shepherd, Emerging rules for distributions of active dendritic conductances, *Nature Rev. Neurosci.* 3, 362-370 (2002).
126. Davison AP, Morse TM, Migliore M, Marenco L, Shepherd GM, and Hines ML. ModelDB: A Resource for Neuronal and Network Modeling. In: *Neuroscience Database: A Practical Guide*. Ed. Rolf Kotter. Kluwer Academic Publishers, Dusseldorf, pp: 99-109 (2002).
127. M. Migliore, L. Messineo, M. Cardaci, GF Ayala, Quantitative modeling of perception and production of time intervals, *J. Neurophysiol.* 86, 2754-2760 (2001).
128. S. Chillemi, R. Balocchi, M. Barbi, A. Di Garbo, R. Ferri, M. Migliore Early trends in Seizure onset: a Nonlinear Approach. In *Mathematics and Computers in Science and Engineering C.E.* D'Attellis, V.V. Kluev, N.E. Mastorakis eds., 156-160, WSES (2001).
129. D. Johnston, D.A. Hoffman, J.C. Magee, N.P. Poolos, S. Watanabe, C.M. Colbert, and M. Migliore, Dendritic Potassium Channels in Hippocampal Pyramidal Neurons. *J. Physiol. (Lond.)*, 525, 75 (2000).
130. M. Migliore, D. Hoffman, J.C. Magee, and D. Johnston, Role of an A-type K<sup>+</sup> conductance in the back-propagation of action potentials in the dendrites of hippocampal neurons. *J. Comput. Neurosci.*, 7, 5, (1999).
131. M. Migliore and P. Lansky, Computational model of the effects of stochastic conditioning on the induction of Long-Term Potentiation and Depression, *Biol. Cybern.*, 81, 291-8 (1999).
132. M. Migliore and P. Lansky, Long-Term Potentiation and Depression induced by a stochastic conditioning of a model synapse, *Biophys. J.*, 77, 1234-43 (1999).
133. M. Migliore and M. Culotta, Energy efficient modulation of dendritic processing functions, *Biosystems*, 48, 157-163 (1998).
134. T. Gessi, R. Bartesaghi, M. Migliore, Neuronal networks in the hippocampal region. II. Impulse transmission patterns, in *Macromolecular Interplay in Brain Associative Mechanisms*, A. Neugebauer Ed., World Scientific (New York), pp. 88 (1997).
135. M. Migliore, F. Alicata, G.F. Ayala, Possible roles of retrograde messengers on LTP, LTD, and associative memory, *Biosystems* 40, 127-32 (1997).
136. M. Migliore, Modeling the attenuation and failure of action potentials in the dendrites of hippocampal neurons, *Biophys. J.* 71, 2394-403 (1996).
137. M. Migliore, E. Cook, D.B. Jaffe, D.A. Turner and D. Johnston, Computer simulations of morphologically reconstructed CA3 hippocampal neurons, *J. Neurophysiol.* 73, 1157-68 (1995).
138. R. Bartesaghi, T. Gessi, M. Migliore, Input-Output relations in the entorhinal-hippocampal-entorhinal loop: entorhinal cortex and dentate gyrus, *Hippocampus* 5, 440-451 (1995).
139. M. Migliore, F. Alicata, G.F. Ayala, A model for Long-Term Potentiation and Depression, *J. Comput. Neurosci.* 2, 335 (1995).
140. F. Alicata, M. Migliore and S.L. Fornili, Monte Carlo evaluation of the hydration free energy for Hydronium, Hydroxyl and Ammonium ions, *J. Mol. Liq.* 58, 117 (1993).
141. M. Migliore, G.F. Ayala, A kinetic model of Short- and Long-Term Potentiation, *Neural Comput.* 5, 636 (1993).



142. Bartesaghi R., Gessi T., Migliore M., Activation of dentate gyrus granule cells by differently elicited perforant path volleys. *Eur. J. Neurosci., Suppl.* 5 p.69 (1992).
143. Bartesaghi R., Gessi T., Migliore M., Entorhinal cortex-hippocampal formation loop: input-output relations in hippocampus. *Neurosci. Lett. Suppl.* 43, S9 (1992).
144. Bartesaghi R., Gessi T., Migliore M. Transfer of impulse volleys along the entorhinal cortex - hippocampal formation - entorhinal cortex loop. *Pflügers Arch.* 421, 36 (1992).
145. M. Migliore, G.F. Ayala, S.L. Fornili, Concurrent simulations of neurons on multi-Transputer systems, *Computers in Physics*, Nov/Dec, 605 (1991).
146. M. Migliore, V. Martorana, F. Sciortino, An algorithm to find all paths between two nodes in a graph *J. Comput. Phys.* 87, 231 (1990).
147. M. Migliore, G.F. Ayala and S.L. Fornili: "Modeling of neuronal systems on Transputer networks", in *Parallel Processing in Neural Systems and Computers*, p.291, R. Eckmiller, G. Hartmann, G. Hauske Eds., Elsevier, 1990.
148. R. Noto, V. Martorana, M. Migliore and S.L. Fornili, Hydration of the Ammonium ion: Monte Carlo simulation, *Z. Naturforsch.* 46a, 107 (1990).
149. G. Corongiu, M. Migliore and E. Clementi, Hydration free energy for  $\text{Li}^+$  at infinite dilution with a 3-body abinitio potential, *J. Chem. Phys.* 90, 4629 (1989).
150. R. Noto, M. Migliore, F. Sciortino and S.L. Fornili, Solute-induced water structure: computer simulation on a model system, *Molec. Simul.* 1, 225 (1988).
151. M. Migliore, G. Corongiu, E. Clementi and G.C. Lie, Monte Carlo study of Free energy for hydration of  $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{F}^-$  and  $\text{Cl}^-$  with ab-initio Potentials, *J. Chem. Phys.* 88, 7766 (1988).
152. G. Andoloro, M.A. Palazzo, M. Migliore, and S.L. Fornili, Hydration of Hydroxide ion: ab-initio calculations and Monte Carlo simulation, *Chem. Phys. Lett.* 149, 201 (1988).
153. M. Migliore, G. Corongiu, E. Clementi and G.C. Lie, Free energy for hydration of  $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{F}^-$  and  $\text{Cl}^-$  with ab-initio Potentials, IBM Technical report KGN-165, Kingston NY, 1987.
154. S.L. Fornili, V. Martorana and M. Migliore. The Transputer in statistical simulation: results of a test, *Inf. Quarterly of CCP5*, June 1987.
155. M. Migliore, S.L. Fornili, E. Spohr and K. Heinzinger, Molecular dynamics study of a KCl aqueous solution: dynamical results, *Z. Naturforsch.* 42a, 227 (1987).
156. M. Leone, F. Sciortino, M. Migliore, S.L. Fornili and M.B. Palma-Vittorelli, Order parameters of gels and gelation kinetics of aqueous Agarose systems: relation to the spinodal decomposition of the sol, *Biopolymers* 26, 743 (1987).
157. S.L. Fornili, M. Migliore and M.A. Palazzo, Hydration of hydronium ion: ab initio calculations and Monte Carlo simulation, *Chem. Phys. Lett.* 125, 419 (1986).
158. M. Migliore, S.L. Fornili, E. Spohr, G. Palinkas and K. Heinzinger, A molecular dynamics study of the structure of an aqueous KCl solution, *Z. Naturforsch.* 41a, 826 (1986).
159. S.L. Fornili, M. Migliore and M.A. Palazzo, Water-hydronium interaction: a computer simulation. in *Biomolecular Stereodynamics vol. III*, 253 (1986), Albany, N.Y.
160. S.L. Fornili, M. Migliore, D.P. Vercauteren and E. Clementi, Monte Carlo simulation of water interaction with Gramicidin A transmembrane channel: hydrogen bond analysis, *Journal de Physique* 45, C7-219 (1984).
161. S.L. Fornili, M. Leone, F. Madonia, M. Migliore, M.B. Palma-Vittorelli, M.U. Palma and P.L. San Biagio, Biomolecular-solvent stereodynamic coupling probed by deuteration, *J. Biomol. Str. Dyn.* 1, 473 (1983).
162. S.L. Fornili and M. Migliore, Microcomputer-based system for automation of spectrophotometric data acquisition for long-lasting kinetics, *J. Phys. E: Sci. Instrum.* 14, 426 (1981).