
BIOGRAPHICAL SKETCH

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NAME MATTEO CALEO		POSITION TITLE Professor of Physiology, University of Padua – Research Associate, CNR Neuroscience Institute, Pisa	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of Pisa	Laurea	11/94	Biological Sciences
Scuola Normale Superiore, Pisa	Diploma	11/94	Biological Sciences
Scuola Normale Superiore, Pisa	PhD	01/98	Neurobiology

A. Personal Statement

I am a neurobiologist with ample expertise in activity-dependent brain plasticity. During my PhD at the Scuola Normale Superiore in Pisa, I worked with Lamberto Maffei on the role of neurotrophic factors (NGF, BDNF) in the development and plasticity of the visual cortex. After becoming group leader at the CNR Neuroscience Institute, I studied the role of inter-hemispheric, transcallosal connections in visual cortical plasticity. I also introduced a line of research devoted to the central effects of botulinum neurotoxins (BoNTs), in collaboration with Cesare Montecucco (Padua) and Gipi Schiavo (London). BoNTs are bacterial proteases that block transmitter release and are widely employed in clinical neurology for the treatment of muscle spasms. In a series of manuscripts, I demonstrated that BoNTs are retrogradely transported from the injected muscle along the axons of motoneurons and directly affect neurotransmission in central areas. Currently, my group is working mainly on neuronal plasticity in brain pathological conditions, including stroke, brain tumors, and epilepsy. I study maladaptive plasticity as well as strategies to enhance brain reorganization for the stimulation of functional recovery. In the field of stroke, I study rehabilitation approaches in which training of the affected arm in robotic devices is combined with “plasticizing” therapies that enhance the ability of spared circuits to undergo experience-dependent modifications. In the field of brain tumors, I study neuronal plasticity in peritumoral regions as well as the role of synaptic activity in tumor growth.

B. Positions and Honors

- Positions and Employment

2001- Research Scientist, CNR Neuroscience Institute, Pisa, Italy
2007- Senior Research Scientist, CNR Neuroscience Institute, Pisa, Italy
2010- Director of Research, CNR Neuroscience Institute, Pisa, Italy
2018- Professor of Physiology, Dept. Biomedical Sciences, University of Padua

- Other Experience and Professional Memberships

Contributor to the book “Treatment of dystonia”, Cambridge University Press (2018)

Contributor to the textbook “Neurosciences”, Springer (2014)

Co-Editor of the book: “Cerebral Plasticity”, published by MIT Press (2011)

Reviewer for various journals (Nature Medicine, Annals of Neurology, Brain, Progress in Neurobiology, Proceedings of the National Academy of Sciences USA, The Journal of Neuroscience, Stroke, Journal of Physiology, Journal of Neurochemistry, Cell Transplantation, Neurorehabilitation and Neural Repair, Epilepsia, etc.)

Reviewer for Agence Nationale de la Recherche (France), Epilepsy Research UK, Dutch Epilepsy Foundation, Austrian Science Fund (FWF), Katholieke Universiteit Leuven, University of Washington, etc.

Organizer and chairman of meetings and symposia in the international and national context (e.g. TOXINS meeting, FENS meeting, Conference on Epileptogenesis, Italian Neuroscience Society, etc.)

National Coordinator of "Olimpiadi delle Neuroscienze"

Member of SINS and SfN

C. Selected Peer-reviewed Publications (15 best peer-reviewed publications)

As of April 2019, Matteo Caleo has a total of 111 PubMed publications (51 in the period 2014-2019)

H index (Google Scholar) = 36, Citations = 4,080

(* , equal contribution as senior authors)

Caleo M, Spinelli M, Colosimo F, Matak I, Rossetto O, Lackovic Z, Restani L (2018) Transynaptic action of botulinum neurotoxin type A at central cholinergic boutons. *J Neurosci* 38(48): 10329-10337.

Terrigno M, Busti I, Alia C, Pietrasanta M, Arisi I, D'Onofrio M, **Caleo M***, Cremisi F* (2018) Neurons generated by mouse ES cell with hippocampal or cortical identity display distinct projection patterns when co-transplanted in the adult brain. *Stem Cell Rep* 10(3): 1016-1029.

Spalletti C, Alia C, Lai S, Panarese A, Conti S, Micera S*, **Caleo M*** (2017) Combining robotic training and inactivation of the healthy hemisphere restores pre-stroke motor patterns in mice. *eLife* 6: e28662.

Vannini E, Olimpico F, Middei S, Ammassari-Teule M, de Graaf EL, McDonnell L, Schmidt G, Fabbri A, Fiorentini C, Baroncelli L, Costa M, **Caleo M** (2016) Electrophysiology of glioma: a Rho GTPase-activating protein reduces tumor growth and spares neuron structure and function. *Neuro-Oncology* 18: 1634-1643.

Cerri C, Genovesi S, Allegra M, Pistillo F, Puentener U, Guglielmotti A, Perry VH, Bozzi Y*, **Caleo M*** (2016) The chemokine CCL2 mediates the seizure enhancing effects of systemic inflammation. *J Neurosci* 36: 3777-3788.

Deidda G, Allegra M, Cerri C, Naskar S, Bony G, Zunino G, Bozzi Y, **Caleo M***, Cancedda L* (2015) Early depolarizing GABA controls critical period plasticity in the rat visual cortex. *Nat Neurosci* 18(1): 87-96.

Mazzocchio R, **Caleo M** (2015) More than at the neuromuscular synapse: actions of botulinum neurotoxin A (BoNT/A) in the central nervous system. *Neuroscientist* 21(1):44-61.

Lai S, Panarese A, Spalletti C, Alia C, Ghionzoli A, **Caleo M***, Micera S* (2015) Quantitative kinematic characterization of reaching impairments in mice after a stroke. *Neurorehabil Neural Repair* 29(4): 382-92.

- Spalletti C, Lai S, Mainardi M, Panarese A, Ghionzoli A, Alia C, Gianfranceschi L, Chisari C, Micera S*, **Caleo M*** (2014) A robotic system for quantitative assessment and post-stroke training of forelimb retraction in mice. *Neurorehabil Neural Repair* 28(2): 188-196.
- Restani L, Giribaldi F, Manich M, Bercsenyi K, Menendez G, Rossetto O, **Caleo M**, Schiavo G (2012) Botulinum Neurotoxins A and E Undergo Retrograde Axonal Transport in Primary Motor Neurons. *PLoS Pathog* 8(12): e1003087.
- Cappello S, Böhringer CR, Bergami M, Conzelmann K-K, Ghanem A, Tomassy GS, Arlotta P, Mainardi M, Allegra M, **Caleo M**, van Hengel J, Brakebusch C, Götz M (2012) A Radial Glia-Specific Role of RhoA in Double Cortex Formation. *Neuron* 73(5): 911-24.
- Restani L, Antonucci F, Gianfranceschi L, Rossi C, Rossetto O, **Caleo M** (2011) Evidence for anterograde transport and transcytosis of botulinum neurotoxin A (BoNT/A). *J Neurosci* 31(44): 15650-15659.
- Cerri C, Fabbri A, Vannini E, Spolidoro M, Costa M, Maffei L, Fiorentini C, **Caleo M** (2011) Activation of Rho GTPases triggers structural remodeling and functional plasticity in the adult rat visual cortex. *J Neurosci* 31(42): 15163-72.
- Pinto L, Drechsel D, Schmid M-T, Ninkovic J, Irmeler M, Brill MS, Restani L, Gianfranceschi L, Cerri C, Weber SN, Tarabykin V, Baer K, Guillemot F, Beckers J, Zecevic N, Dehay C, **Caleo M**, Schorle H, Gotz M (2009) AP2 γ regulates basal progenitor fate in a region- and layer-specific manner in the developing cortex. *Nat Neurosci* 12(10): 1229-1237.
- Restani L, Cerri C, Pietrasanta M, Gianfranceschi L, Maffei L, **Caleo M** (2009) Functional masking of deprived eye responses by callosal input during ocular dominance plasticity. *Neuron* 64(5): 707-718.

D. Research Support

▪ Ongoing Research Support

Brain-glioma interactions: effects of glioma cells on neuron activity and its impact on tumor growth, AIRC (PI)

Proteomica/genomica/metabolomica per l'individuazione di biomarcatori in fluidi corporei periferici: applicazione al glioblastoma multiforme (GLIOMICS), Regione Toscana (Partner)

All-optical brain-to-brain behaviour and information transfer (Brainbit), H2020 (Partner of ERC Advanced grant, Prof. Pavone)

Inter-neuronal transfer of clostridial neurotoxins and Tau: cell specificity and relevance for brain disorders, CNR Joint Laboratories (PI)

Physiological neuronal activity in the control of glioma progression and tumor microenvironment, PRIN 2017 (Partner)

▪ Completed Research Support

Neuroplasticity and functional recovery after stroke, Fondazione Pisa (PI)

Activation of Rho GTPases to prevent glioma growth and spare neuronal functions, AIRC (PI)

In vitro and in vivo studies of molecular signals that steer the fate of embryonic stem cells toward specific cortical cell types, PRIN 2012 (Partner)

Robotica indossabile personalizzata per la riabilitazione motoria dell'arto superiore nei pazienti neurologici (RONDA), Regione Toscana (Partner)

Omics approaches for the characterization of novel glioma therapies, CNR (PI)