

PERSONAL
INFORMATION

Massimiliano Renzi



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EBRAINS-Italy https://www.ebrains-italy.eu/research-groups/37?research_groups=UNIROMA1b

Sex M | D.O.B. 08/02/1971 | Nationality Italian

POSITION

Associate Professor in Physiology

SSD BIO/09 PHYSIOLOGY

Dept of Physiology and Pharmacology

Sapienza University of Rome

WORK EXPERIENCE

2021 – current

Associate Professor in Physiology

SSD BIO/09 PHYSIOLOGY

Dept of Physiology and Pharmacology

Sapienza University of Rome

2011 – 2021

Assistant Professor in Physiology

SSD BIO/09 PHYSIOLOGY

Dept of Physiology and Pharmacology

Sapienza University of Rome

2003 – 2011

Postdoctoral Research Fellow

Lab. Prof. Stuart G Cull-Candy & Prof. M Farrant

Department of Pharmacology

Department of Neuroscience, Physiology and Pharmacology

University College London (UK)

1999 – 2003

PhD student

Course: Neurophysiology

Lab. Prof. F Eusebi

Dept of Human Physiology

University of Rome 'La Sapienza'

1998 – 1999

Ad hoc Researcher

Convenzione: Patologia clinica e terapia AIDS & X Progetto AIDS

Lab. Prof G Levi / Dr S Visentin

Istituto Superiore di Sanità, Rome

1996 – 1998 **Undergrad training**
 Lab. Prof G Levi / Dr S Visentin
 Istituto Superiore di Sanità, Rome

EDUCATION AND TRAINING

		QEQ
2014	'Abilitazione Scientifica Nazionale' Associate Professor 05/D1 – PHYSIOLOGY	N/A
2013	Personal Licence for the use of ALS animal models (pre-symptomatic) in research ('Autorizzazione Protocollo Sperimentale') Italian Ministry of Health	N/A
2013	Personal Licence for the use of ALS animal models (symptomatic) in research ('Autorizzazione Protocollo Sperimentale') Italian Ministry of Health	N/A
2004	Personal Licence UK, Animals (Scientific Procedures) Act 1986 Module 1-3 training Institute of Biology - Biological Services – UCL	N/A
2004	PhD in Neurophysiology Lab. Prof. F Eusebi Dept of Human Physiology University of Rome 'La Sapienza'	8
2000	Chartered Biologist (150/150)	N/A
1998	B.S. in Biology (110/110 with Honours) University of Rome 'La Sapienza'	7

PERSONAL SKILLS

Mother tongue(s) **Italian**

Other language(s)

SELF-ASSESSMENT

UNDERSTANDING		SPEAKING		WRITING	
Listening	Reading	Spoken interaction	Spoken production		
English	C1/C2	C1/C2	B1/B2	B1/B2	C1/C2

Communication skills Good communication skills acquired during my experience as: academic tutor and Professor (both in Italy and in the UK)

Organisational / managerial skills Good organisational / managerial skills acquired during my experience as: Principal Investigator / component of Research Projects; Supervisor of undergrad students; Erasmus students

Job-related skills More than 20-yrs long experience in: Electrophysiology (patch-clamp); ex-vivo and heterologous cell systems; neuroscience
Basic experience in: Live-imaging; molecular biology techniques

Digital skills	SELF-ASSEMENT				
	Information processing	Communication	Content creation	Safety	Problem solving
	Independent user	Independent user	Independent user	Basic user	Basic user

Software

- pClamp; MetaMorph; Igor; Neuromatic

Driving licence B

ADDITIONAL INFORMATION

RESEARCH My research interest concerns the neuron-neuron and neuron-glia signalling and its regulation in physiological and pathological conditions.
My studies focus on the role of ion channels, from the single-channel level to synaptic plasticity and network activity, and how they shape the excitation-inhibition balance in neurons.

Currently, I am focussing on:

- The role of VTA neurons and Meso-Cortico-Limbic dopaminergic network in depression-like behaviours of early-life stress mouse models (funded by Progetto di Ricerca di Ateneo 2021; Neurobiol. of Stress 2021);
- The role of excitatory and inhibitory signalling in the hippocampus along ageing (funded by PNRR-IR) and Alzheimer’s Disease (Exp. Neurology 2022);
- The biocompatibility of engineered silicon- or carbon- derived nano-structures (Mater. Res. Express 2019).

Previously, during my post-doctoral work, I have investigated:

- The synaptic plasticity at the cerebellar synapse between climbing-fibres and oligodendrocyte progenitors (Nature Neuroscience 2011)

- The role of GABAergic inhibition in cerebellar synaptic plasticity and motor learning (Nature Neuroscience 2007 and 2009)
- The impact of properties of LGICs (GABA_ARs; AMPARs; NMDARs) and regulatory proteins on synaptic activity (Journal of Neuroscience 2011 and 2012; Nature Neuroscience 2009; Journal of Physiology 2007).

My research activity is based at the Physiology and Pharmacology Dept, Sapienza University of Rome (I).

Formerly, I have worked at the Patho-Physiology Dept, Istituto Superiore di Sanità (Rome, I; predoctoral); and at the Neuroscience, Physiology and Pharmacology Dept., University College London (UK; postdoctoral).

Collaborators:

For studies on Meso-Cortico-Limbic dopaminergic network:

Prof R Ventura (Sapienza Univ.)

Prof D Ragozzino and Prof D Caprioli (Sapienza Univ.)

For studies on ageing:

Prof M Migliore (Institute of Biophysics IBF - Italian National Research Council)

Dr S Marinelli (EBRI, Rome)

For studies on nano-structured materials and ion channels biophysics:

Prof F Palma (Sapienza Univ.)

Prof S Fucile (Sapienza Univ.)

Former collaborators:

Prof. SG Cull-Candy and Prof M Farrant (Neuroscience, Physiology and Pharmacology Dept., UCL)

Dr Arozena-Acevedo (MRC UK).

FUNDING

2022	PNRR-IR (PNRR 2022 CALL M4-C2-L3.1.1; Unit Principal Investigator – € 135K)
2021	Progetto di Ricerca di Ateneo 2021 (RP12117A58C6D266; Principal Investigator – € 3K)
2012	AriSLA Pilot Grant 2012 (Principal Investigator – € 58K)
2011	UCL Graduate School (Research Staff Bridging Fund)
2008 - 2010	Pasteur Inst. – Fond. Cenci-Bolognetti (postdoctoral fellowship – 2 yrs)
2004 - 2006	Pasteur Inst. – Fond. Cenci-Bolognetti (postdoctoral fellowship – 2 yrs)
2012 – current	Team Investigator in research projects funded by Sapienza University (since 2012)

PEER-REVIEWED PUBLICATIONS

Garofalo et al. (2023)

Natural killer cells and innate lymphoid cells tune anxiety-like behavior and memory in mice via interferon- γ and acetylcholine

NATURE COMMUNICATIONS

DOI: 10.1038/s41467-023-38899-3

Colombo et al. (2023)
Rare Missense Variants of the Human $\beta 4$ Subunit Alter Nicotinic $\alpha 3\beta 4$ Receptor
Plasma Membrane Localisation
MOLECULES
DOI: 10.3390/molecules28031247

Spoleti et al. (2022)
Early derailment of firing properties in CA1 pyramidal cells of the ventral
hippocampus in an Alzheimer's disease mouse model
EXPERIMENTAL NEUROLOGY
DOI: 10.1016/j.expneurol.2021.113969

Gaetani et al. (2022)
Biocompatibility and Connectivity of Semiconductor Nanostructures for Cardiac
Tissue Engineering Applications
BIOENGINEERING
DOI: 10.3390/bioengineering9110621

Pucci et al. (2021)
Evidence of a dual mechanism of action underlying the anti-proliferative and
cytotoxic effects of ammonium-alkyloxy-stilbene-based $\alpha 7$ - and $\alpha 9$ -nicotinic
ligands on glioblastoma cells
PHARMACOLOGICAL RESEARCH
DOI: 10.1016/j.phrs.2021.105959

Basilico et al. (2021)
Microglia control glutamatergic synapses in the adult mouse hippocampus
GLIA
DOI: 10.1002/glia.24101

D'Addario et al. (2021)
Resilience to anhedonia-passive coping induced by early life experience is linked
to a long-lasting reduction of Ih current in VTA dopaminergic neurons
NEUROBIOLOGY OF STRESS, 14:100324
DOI: 10.1016/j.ynstr.2021.100324

Bavo et al. (2020)
Modifications at C(5) of 2-(2-Pyrrolidinyl)-Substituted 1,4- Benzodioxane Elicit
Potent $\alpha 4\beta 2$ Nicotinic Acetylcholine Receptor Partial Agonism with High Selectivity
over the $\alpha 3\beta 4$ Subtype
J. MED. CHEM., 63, 15668–15692
DOI: 10.1021/acs.jmedchem.0c01150

Piedimonte et al. (2020)

Silicon Nanowires as Contact Between the Cell Membrane and CMOS Circuits
Lecture Notes in Electrical Engineering ISBN:978-3-030-37276-7.... - ISSN:1876-1100

DOI: 10.1007/978-3-030-37277-4_28

Piedimonte et al. (2019)
Biocompatibility of Silicon NanoWires: a Step Towards IC Detectors
AIP Congress Proceeding 2145(1):020011
DOI: 10.1063/1.5123572

Piedimonte et al. (2019)
Silicon nanowires as biocompatible electronics-biology interface
IEEE
DOI: 10.1109/TRANSDUCERS.2019.8808824

Piedimonte et al. (2019)
Silicon nanowires to detect electric signals from living cells
MATER. RES. EXPRESS 6 084005
DOI: <https://doi.org/10.1088/2053-1591/ab20f8>

Onorato et al. (2016)
Noise Enhances Action Potential Generation in Mouse Sensory Neurons via Stochastic Resonance
PLOS ONE 11(8)e0160950
DOI: 10.1371/journal.pone.0160950

Coombs et al. (2012)
Comichons modify channel properties of recombinant and glial AMPA receptors.
J NEUROSCIENCE, 32 (29):9796–9804
DOI: 10.1523/JNEUROSCI.0345-12.2012

Eyre et al. (2012)
Setting the time course of inhibitory synaptic currents by mixing multiple GABA(A) receptor α subunit isoforms
J NEUROSCIENCE, 32 (17):5853–5867
DOI: <https://doi.org/10.1523/JNEUROSCI.6495-11.2012>

Zonouzi et al. (2011)
Bidirectional regulation of calcium-permeable AMPA receptors in oligodendrocytes lineage cells
NATURE NEUROSCIENCE, 14 (11):1430–1438
DOI: 10.1038/nn.2942

Bright et al. (2011)
Profound desensitization by ambient GABA limits activation of α -containing

GABAA receptors during spillover
J NEUROSCIENCE, 31 (2):753–763
DOI: <https://doi.org/10.1523/JNEUROSCI.2996-10.2011>

Wulff et al. (2009)
Synaptic inhibition of Purkinje cells mediates consolidation of vestibulo-cerebellar motor learning
NATURE NEUROSCIENCE, 12 (8):1042–1049
DOI: <https://doi.org/10.1038/nn.2348>

Soto et al. (2009)
Selective regulation of long-form calcium-permeable AMPA receptors by an atypical TARP, gamma-5
NATURE NEUROSCIENCE, 12 (3):277–285
DOI: <https://doi.org/10.1038/nn.2266>

Renzi et al. (2007)
Climbing-fibre activation of NMDA receptors in Purkinje cells of adult mice
J PHYSIOL, 585 (1):91–101
DOI: [10.1113/jphysiol.2007.141531](https://doi.org/10.1113/jphysiol.2007.141531)

Wulff et al. (2007)
From synapse to behavior: rapid modulation of defined neuronal types with engineered GABAA receptors
NATURE NEUROSCIENCE 10 (7):923–929
DOI: <https://doi.org/10.1038/nn1927>

Fucile et al. (2004)
Nicotinic cholinergic stimulation promotes survival and reduces motility of cultured rat cerebellar granule cells
NEUROSCIENCE, 127 (1):53–61
DOI: [10.1016/j.neuroscience.2004.04.017](https://doi.org/10.1016/j.neuroscience.2004.04.017)

Tonini et al. (2004)
Unliganded human mutant $\alpha 7$ nicotinic receptors are modulated by Ca^{2+} and trace levels of Zn^{2+}
NEUROPHARMACOLOGY 6 (5):727–733
DOI: [10.1016/j.neuropharm.2003.11.001](https://doi.org/10.1016/j.neuropharm.2003.11.001)

Fucile et al. (2003)
Fractional Ca^{2+} current through human neuronal $\alpha 7$ nicotinic acetylcholine receptors
CELL CALCIUM 34 (2):205–209
DOI: [10.1016/s0143-4160\(03\)00071-x](https://doi.org/10.1016/s0143-4160(03)00071-x)

Palma et al. (2003)

Microtransplantation of membranes from cultured cells to *Xenopus* oocytes: a method to study neurotransmitter receptors embedded in native lipids

P.N.A.S., 100 (5):2896–2900

DOI: <https://doi.org/10.1073/pnas.0438006100>

Lax et al. (2002)

Chemokine receptor CXCR2 regulates the functional properties of AMPA-type glutamate receptor GluR1 in HEK cells

J NEUROIMMUNOL, 129 (1-2):66–73

DOI: 10.1016/s0165-5728(02)00178-9

Ragozzino et al. (2002)

Stimulation of chemokine CXC receptor 4 induces synaptic depression of evoked parallel fibers inputs onto Purkinje neurons in mouse cerebellum

J NEUROIMMUNOL, 127 (1-2):30–36

DOI: 10.1016/s0165-5728(02)00093-0

Visentin et al. (2001)

Altered outward-rectifying K⁺ current reveals microglial activation induced by HIV-1 Tat protein

GLIA 33, (3):181-190

DOI: 10.1002/1098-1136(200103)33:3<181::aid-glia1017>3.0.co;2-q

Visentin et al. (1999)

Two different ionotropic receptors are activated by ATP in rat microglia

J PHYSIOL, 519 (3):723–736

DOI: 10.1111/j.1469-7793.1999.0723n.x

PEER-REVIEWING

Review Editor

Frontiers in Cellular Neuroscience - Cellular Neurophysiology

Frontiers in Molecular Neuroscience - Molecular Signalling and Pathways

Journal of Integrative Neuroscience

Journal of Molecular and Clinical Medicine

Funding bodies

Research Foundation Flanders (FWO)

'Ad hoc' (alone or with others)

Nature Neuroscience; Human Molecular Genetics; Cerebellum; Nature; Journal of Physiology; Journal of Neuroscience; European Journal of Neuroscience; Neuroscience; Life

TEACHINGItaly*Academic courses*

- 2012 – current Physiology and Anatomy
Biotechnologie Farmaceutiche (Sapienza University - Italian)
Head of the Course - Lecturer of General and Human Physiology
- 2015 – current Laboratory of pharmaco-biological activity
Biotechnologie Farmaceutiche (Sapienza University - Italian)
Head of the Course – Lecturer and Trainer
- 2017 – current Fundamentals of organs morphology and function – Physiology and food science
Module
Nursing (Sapienza University - English)
Lecturer of General and Human Physiology
- 2021 – current Anatomo-Physiological Bases of the Human Body
Terapia Occupazionale (Sapienza University - Italian)
Head of the Course - Lecturer of General and Human Physiology

PhD Courses

- 2012 - current Teaching for the PhD Course in Neuroscienze Clinico-Sperimentali e Psichiatria
Curriculum Neurophysiology (Sapienza University – Italian)

United Kingdom*Tutor for Academic courses*

- 2008 - 2011 **Neuropharmacology** – University College London
- 2008 - 2010 **Synaptic pharmacology** – University College London
- 2005 **Master in Neuroscience** – University College London

International training
courses (Tutor)

- 2006 - 2010 **Microelectrode Techniques for Cell Physiology Workshop**
Annual International Course – Marine Biological Association (Plymouth, UK)

SUPERVISION of students

PhD students

- 2022 - present G Chilà (PNRR-IR funded PhD in Clinical-Experimental Neuroscience and
Psychiatry)

Erasmus-CIVIS students

- May-Jul 2022 Audrey Aubert (Internship NeuroSchool)

Experimental thesis training
for undergraduate students

- 2021 - 2022 G Chilà (LM Biotechn. Farmac. Thesis project *manuscript in preparation*)
- 2018 - 2019 E Spoletti (LM Biotechn. Farmac. Thesis project published in Exp.Neurol.2022)
- 2014 - 2016 F Logiacco(LM Biotechn. Farmac. Thesis project presented at UCL Neuroscience
Symposium 2014)

2013 - 2015 A Iannella (LM Neurobiologia)

Co-Supervision of undergrad students

2019 - 2020 G Mele (LM Biotechn. Farmac.)

Internationalization

2024 - present Promoter for:

Erasmus Learning Agreement between Sapienza – Pharmaceutical Biotechnology LM and Karolinska Institutet – Master’s Programme in Translational Physiology and Pharmacology