

Cristina Zona - Curriculum Vitae

Cristina Zona è nata a Roma, Italia e si è laureata nel 1978 con 110/110 e lode in Matematica presso l'Università "La Sapienza" di Roma.

Posizione

Dal 2001 ad oggi è Professoressa Associata in Fisiologia presso l'Università di Roma "Tor Vergata", Dipartimento di Medicina dei Sistemi.

Dal 2012 è idonea a ricoprire le funzioni di Professore Ordinario in Fisiologia a seguito di giudizi nazionali di idoneità.

Formazione/Posizioni

1980-2000: Tecnico Laureato presso la Facoltà di Medicina dell'Università "La Sapienza" e di "Tor Vergata" di Roma.

1983: Incarico di collaborazione di ricerca presso il Laboratorio di Cibernetica e Biofisica, Consiglio Nazionale di Ricerca (CNR), Camogli, Genova.

1984: Incarico di collaborazione di ricerca presso il Dipartimento di Neurofisiologia, Max-Planck-Institute for Psychiatry di Monaco, Germania.

1985: Incarico di collaborazione di ricerca presso il Dipartimento di Neurologia, Harvard Medical School di Boston, Massachusetts, U.S.A.

1989: Visiting Scientist presso il Dipartimento di Neurologia e Neurochirurgia, Istituto Neurologico di Montreal, McGill University, Montreal, Canada.

1990: Visiting Scientist presso il Dipartimento di Fisiologia di Kioto, Giappone.

2002: Visiting Scientist presso il Dipartimento di Neurologia, Harvard Medical School di Boston, U.S.A.

Dal 1984: E' la responsabile del laboratorio di Elettrofisiologia Cellulare dell'Università di Roma "Tor Vergata".

Dal 1996: E' la responsabile del laboratorio di Neurobiofisica presso I.R.C.C.S. Fondazione Santa Lucia, Roma, Italia.

Attività Tutoriale e Didattica

Ha svolto attività didattica sin dall'inizio della sua carriera, organizzando attività di laboratorio per gli studenti e tenendo lezioni formali. Dal 2000 tiene lezioni in qualità di Professoressa Associata in Fisiologia nei vari corsi di Fisiologia della Facoltà di Medicina e Chirurgia e dal 2014 nel corso di studi in inglese di Pharmacy dell'Università di Roma "Tor Vergata".

Campi di Ricerca/Finanziamenti di Ricerca

L'attività di ricerca è svolta nell'ambito dello studio della eccitabilità neuronale, della modulazione dei canali ionici e dei meccanismi di azione di farmaci in modelli sperimentali del Sistema Nervoso Centrale di mammifero, tramite l'applicazione di tecniche di elettrofisiologia. Svolge una intensa attività di ricerca nell'ambito di malattie neurodegenerative, in particolare sulla Sclerosi Laterale Amiotrofica (SLA). In questo ambito gli studi si indirizzano sulla alterata funzionalità dei canali ionici voltaggio-dipendenti e sui recettori ionotropici in modelli genetici di SLA.

Principali progetti di ricerca finanziati negli ultimi anni:

- Contratti di ricerca dalla casa farmaceutica UCB Pharma, Braine-l'Alleud, Belgio per lo studio degli effetti di specifici farmaci sulle correnti ioniche di neuroni della corteccia cerebrale.
- Progetto di ricerca dall'Agenzia Spaziale Italiana (ASI).
- Progetto di ricerca finanziato dalla Fondazione Telethon (Italia): "Functional studies of spinal motor neurons in a genetic model of Amyotrophic Lateral Sclerosis (ALS)".
- Responsabile scientifica nazionale (5 unità di ricerca) del progetto FIRB per lo studio della Sclerosi Laterale Amiotrofica (SLA).
- Contratto di ricerca dalla Pfizer, Italia e Angelini Acraf S.P.A., Pomezia (Roma) per studiare gli effetti di specifici composti su modelli in vitro di SLA.
- Progetto di ricerca dalla Fondazione Latran, Francia, per effettuare studi elettrofisiologici su modelli di SLA.
- Progetto di ricerca dell'Università di "Tor Vergata", effettua studi sulla alterata espressione e funzione di canali ionici nel Sistema Nervoso Centrale in modelli di SLA.

Affiliazione a Società Scientifiche

Dal 1992: Membro della Società Italiana, Europea e Americana di Neuroscienze

Dal 1996: Membro della Società Italiana di Fisiologia.

Riconoscimenti Internazionali

Revisore scientifico per diverse qualificate riviste internazionali e invitata come speaker in diverse conferenze internazionali.

Indicatori bibliometrici

E' autrice di oltre 80 lavori scientifici, tutti pubblicati su qualificate riviste internazionali con alto impact factor.

Principali pubblicazioni scientifiche negli ultimi 10 anni

1: Saba L, Viscomi MT, Martini A, Caioli S, Mercuri NB, Guatteo E, **Zona C**. Modified age-dependent expression of NaV1.6 in an ALS model correlates with motor cortex excitability alterations. *Neurobiol Dis.* 2019 Oct;130:104532. doi: 10.1016/j.nbd.2019.104532.

2: Latina V, Caioli S, **Zona C**, Ciotti MT, Borreca A, Calissano P, Amadoro G. NGF-Dependent Changes in Ubiquitin Homeostasis Trigger Early Cholinergic Degeneration in Cellular and Animal AD-Model. *Front Cell Neurosci.* 2018 Dec 13;12:487. doi: 10.3389/fncel.2018.00487. eCollection 2018.

3: Spitalieri P, Talarico RV, Caioli S, Murdocca M, Serafino A, Girasole M, Dinarelli S, Longo G, Pucci S, Botta A, Novelli G, **Zona C**, Mango R, Sangiuolo F. Modelling the pathogenesis of Myotonic Dystrophy type 1 cardiac phenotype through human iPSC-derived cardiomyocytes. *J Mol Cell Cardiol.* 2018 May;118:95-109. doi: 10.1016/j.yjmcc.2018.03.012.

- 4:** Antonini A, Caioli S, Saba L, Vindigni G, Biocca S, Canu N, **Zona C**. Membrane cholesterol depletion in cortical neurons highlights altered NMDA receptor functionality in a mouse model of amyotrophic lateral sclerosis. *Biochim Biophys Acta Mol Basis Dis*. 2018 Feb;1864(2):509-519. doi: 10.1016/j.bbadis.2017.11.008.
- 5:** Mannironi C, Biundo A, Rajendran S, De Vito F, Saba L, Caioli S, **Zona C**, Ciotti T, Caristi S, Perlas E, Del Vecchio G, Bozzoni I, Rinaldi A, Mele A, Presutti C. miR-135a Regulates Synaptic Transmission and Anxiety Like Behavior in Amygdala. *Mol Neurobiol*. 2018 Apr;55(4):3301-3315. doi: 10.1007/s12035-017-0564-9.
- 6:** Latina V, Caioli S, **Zona C**, Ciotti MT, Amadoro G, Calissano P. Impaired NGF/TrkA Signaling Causes Early AD-Linked Presynaptic Dysfunction in Cholinergic Primary Neurons. *Front Cell Neurosci*. 2017 Mar 15;11:68. doi: 10.3389/fncel.2017.00068. eCollection 2017.
- 7:** Caioli S, Severini C, Ciotti T, Florenzano F, Pimpinella D, Petrocchi Passeri P, Balboni G, Polisca P, Lattanzi R, Nisticò R, Negri L, **Zona C**. Prokineticin system modulation as a new target to counteract the amyloid beta toxicity induced by glutamatergic alterations in an in vitro model of Alzheimer's disease. *Neuropharmacology*. 2017 Apr;116:82-97. doi: 10.1016/j.neuropharm.2016.12.012.
- 8:** Laricchiuta D, Saba L, De Bartolo P, Caioli S, **Zona C**, Petrosini L. Maintenance of aversive memories shown by fear extinction-impaired phenotypes is associated with increased activity in the amygdaloid prefrontal circuit. *Sci Rep*. 2016 Feb 15;6:21205. doi: 10.1038/srep21205.
- 9:** Caioli S, Candelotti E, Pedersen JZ, Saba L, Antonini A, Incerpi S, **Zona C**. Baicalein reverts L-valine-induced persistent sodium current up-modulation in primary cortical neurons. *Biochim Biophys Acta*. 2016 Apr;1862(4):566-575. doi: 10.1016/j.bbadis.2015.12.021.
- 10:** Severini C, Lattanzi R, Maftai D, Marconi V, Ciotti MT, Petrocchi Passeri P, Florenzano F, Del Duca E, Caioli S, **Zona C**, Balboni G, Salvadori S, Nisticò R, Negri L. Bv8/prokineticin 2 is involved in A β -induced neurotoxicity. *Sci Rep*. 2015 Oct 19;5:15301. doi: 10.1038/srep15301.
- 11:** Mollinari C, Racaniello M, Berry A, Pieri M, de Stefano MC, Cardinale A, **Zona C**, Cirulli F, Garaci E, Merlo D. miR-34a regulates cell proliferation, morphology and function of newborn neurons resulting in improved behavioural outcomes. *Cell Death Dis*. 2015 Jan 29;6:e1622. doi: 10.1038/cddis.2014.589.
- 12:** Saba L, Viscomi MT, Caioli S, Pignataro A, Bisicchia E, Pieri M, Molinari M, Ammassari-Teule M, **Zona C**. Altered Functionality, Morphology, and Vesicular Glutamate Transporter Expression of Cortical Motor Neurons from a Presymptomatic Mouse Model of Amyotrophic Lateral Sclerosis. *Cereb Cortex*. 2016 Apr;26(4):1512-28. doi: 10.1093/cercor/bhu317.

- 13:** Campolongo P, Ratano P, Ciotti MT, Florenzano F, Nori SL, Marolda R, Palmery M, Rinaldi AM, **Zona C**, Possenti R, Calissano P, Severini C. Systemic administration of substance P recovers beta amyloid-induced cognitive deficits in rat: involvement of Kv potassium channels. *PLoS One*. 2013 Nov 12;8(11):e78036. doi: 10.1371/journal.pone.0078036. eCollection 2013.
- 14:** Severini C, Passeri PP, Ciotti M, Florenzano F, Possenti R, **Zona C**, Di Matteo A, Guglielmotti A, Calissano P, Pachter J, Mercanti D. Bindarit, inhibitor of CCL2 synthesis, protects neurons against amyloid- β -induced toxicity. *J Alzheimers Dis*. 2014;38(2):281-93. doi: 10.3233/JAD-131070.
- 15:** Caioli S, Pieri M, Antonini A, Guglielmotti A, Severini C, **Zona C**. Monocyte Chemoattractant Protein-1 upregulates GABA-induced current: evidence of modified GABAA subunit composition in cortical neurons from the G93A mouse model of Amyotrophic Lateral Sclerosis. *Neuropharmacology*. 2013 Oct;73:247-60. doi: 10.1016/j.neuropharm.2013.05.045. Epub 2013 Jun 8.
- 16:** Pieri M, Caioli S, Canu N, Mercuri NB, Guatteo E, **Zona C**. Over-expression of N-type calcium channels in cortical neurons from a mouse model of Amyotrophic Lateral Sclerosis. *Exp Neurol*. 2013 Sep;247:349-58. doi: 10.1016/j.expneurol.2012.11.002. Epub 2012 Nov 8.
- 17:** Caioli S, Curcio L, Pieri M, Antonini A, Marolda R, Severini C, **Zona C**. Substance P receptor activation induces downregulation of the AMPA receptor functionality in cortical neurons from a genetic model of Amyotrophic Lateral Sclerosis. *Neurobiol Dis*. 2011 Oct;44(1):92-101. doi: 10.1016/j.nbd.2011.06.008. Epub 2011 Jun 25.
- 18:** Venerosi A, Martire A, Rungi A, Pieri M, Ferrante A, **Zona C**, Popoli P, Calamandrei G. Complex behavioral and synaptic effects of dietary branched chain amino acids in a mouse model of amyotrophic lateral sclerosis. *Mol Nutr Food Res*. 2011 Apr;55(4):541-52. doi: 10.1002/mnfr.201000296. Epub 2011 Jan 5.
- 19:** Carunchio I, Curcio L, Pieri M, Pica F, Caioli S, Viscomi MT, Molinari M, Canu N, Bernardi G, **Zona C**. Increased levels of p70S6 phosphorylation in the G93A mouse model of Amyotrophic Lateral Sclerosis and in valine-exposed cortical neurons in culture. *Exp Neurol*. 2010 Nov;226(1):218-30. doi: 10.1016/j.expneurol.2010.08.033. Epub 2010 Sep 9.
- 20:** Barbato C, Ruberti F, Pieri M, Vilardo E, Costanzo M, Ciotti MT, **Zona C**, Cogoni C. MicroRNA-92 modulates K(+) Cl(-) co-transporter KCC2 expression in cerebellar granule neurons. *J Neurochem*. 2010 May;113(3):591-600. doi: 10.1111/j.1471-4159.2009.06560.x. Epub 2009 Dec 26.

- 21: Zona C**, Pieri M, Carunchio I, Curcio L, Klitgaard H, Margineanu DG. Brivaracetam (ucb 34714) inhibits Na(+) current in rat cortical neurons in culture. *Epilepsy Res.* 2010 Jan;88(1):46-54. doi: 10.1016/j.eplesyres.2009.09.024. Epub 2009 Nov 13.
- 22:** Loizzo S, Pieri M, Ferri A, Carrì MT, **Zona C**, Fortuna A, Vella S. Dynamic NAD(P)H post-synaptic autofluorescence signals for the assessment of mitochondrial function in a neurodegenerative disease: monitoring the primary motor cortex of G93A mice, an amyotrophic lateral sclerosis model. *Mitochondrion.* 2010 Mar;10(2):108-14. doi: 10.1016/j.mito.2009.11.001.
- 23:** Mollinari C, Ricci-Vitiani L, Pieri M, Lucantoni C, Rinaldi AM, Racaniello M, De Maria R, **Zona C**, Pallini R, Merlo D, Garaci E. Downregulation of thymosin beta4 in neural progenitor grafts promotes spinal cord regeneration. *J Cell Sci.* 2009 Nov 15;122(Pt 22):4195-207. doi: 10.1242/jcs.056895.
- 24:** Armogida M, Giustizieri M, **Zona C**, Piccirilli S, Nisticò R, Mercuri NB. N-ethyl lidocaine (QX-314) protects striatal neurons against ischemia: an in vitro electrophysiological study. *Synapse.* 2010 Feb;64(2):161-8. doi: 10.1002/syn.20735.
- 25:** Pieri M, Amadoro G, Carunchio I, Ciotti MT, Quaresima S, Florenzano F, Calissano P, Possenti R, **Zona C**, Severini C. SP protects cerebellar granule cells against beta-amyloid-induced apoptosis by down-regulation and reduced activity of Kv4 potassium channels. *Neuropharmacology.* 2010 Jan;58(1):268-76. doi: 10.1016/j.neuropharm.2009.06.029.
- 26:** Spadoni O, Crestini A, Piscopo P, Malvezzi-Campeggi L, Carunchio I, Pieri M, **Zona C**, Confaloni A. Gene expression profiles of APP and BACE1 in Tg SOD1G93A cortical cells. *Cell Mol Neurobiol.* 2009 Jul;29(5):635-41. doi: 10.1007/s10571-009-9356-8.
- 27:** Pieri M, Carunchio I, Curcio L, Mercuri NB, **Zona C**. Increased persistent sodium current determines cortical hyperexcitability in a genetic model of amyotrophic lateral sclerosis. *Exp Neurol.* 2009 Feb;215(2):368-79. doi: 10.1016/j.expneurol.2008.11.002.
- 28:** Carunchio I, Mollinari C, Pieri M, Merlo D, **Zona C**. GAB(A) receptors present higher affinity and modified subunit composition in spinal motor neurons from a genetic model of amyotrophic lateral sclerosis. *Eur J Neurosci.* 2008 Oct;28(7):1275-85. doi: 10.1111/j.1460-9568.2008.06436.x.
- 29:** Sgobio C, Trabalza A, Spalloni A, **Zona C**, Carunchio I, Longone P, Ammassari-Teule M. Abnormal medial prefrontal cortex connectivity and defective fear extinction in the presymptomatic G93A SOD1 mouse model of ALS. *Genes Brain Behav.* 2008 Jun;7(4):427-34.

INGLESE

Cristina Zona - Curriculum Vitae

Cristina Zona was born in Rome, Italy and graduated in 1978 with 110/110 cum laude in Mathematics from the "La Sapienza" University of Rome.

Position

Since 2001 she is Associate Professor in Physiology at the University of Rome "Tor Vergata", Department of Systems Medicine.

Since 2012 she is eligible as Full Professor in Physiology following National suitability judgments.

Education / Positions

1980-2000: Technician graduated from the Faculty of Medicine of the University "La Sapienza" and of "Tor Vergata" of Rome.

1983: Research collaboration assignment at the Laboratory of Cybernetics and Biophysics, National Research Council (CNR), Camogli, Genoa.

1984: Research collaboration assignment at the Department of Neurophysiology, Max-Planck-Institute for Psychiatry in Munich, Germany.

1985: Research collaboration assignment at the Department of Neurology, Harvard Medical School, Boston, Massachusetts, U.S.A.

1989: Visiting Scientist at the Department of Neurology and Neurosurgery, Montreal Neurological Institute, McGill University, Montreal, Canada.

1990: Visiting Scientist at the Department of Physiology of Kyoto, Japan.

2002: Visiting Scientist at the Department of Neurology, Harvard Medical School in Boston, U.S.A.

Since 1984: she is the head of the Cell Electrophysiology laboratory at the University of Rome "Tor Vergata".

Since 1996: she is the head of the Neurobiophysics laboratory at I.R.C.C.S. Saint Lucia Foundation, Rome, Italy.

Tutorial and Teaching Activities

She has been teaching since the beginning of her career, organizing laboratory activities for students and giving formal lessons. Since 2000 she is lecture as Associate Professor in Physiology in the various Physiology courses of the Faculty of Medicine and Surgery and since 2014 in the degree English course of Pharmacy at the University of Rome "Tor Vergata".

Fields of Research / Research Funding

The research activity is carried out in the study of neuronal excitability, ion channel modulation and drug action mechanisms in experimental models of the mammalian Central Nervous System, through the application of electrophysiology techniques. She carries out an intense research activity in the field of neurodegenerative diseases, in particular on Amyotrophic Lateral Sclerosis (ALS). In this context, the studies focus on the altered functionality of voltage-dependent ion channels and on ionotropic receptors in genetic models of ALS.

Major research projects funded in recent years:

- Research contracts from the pharmaceutical company UCB Pharma, Braine-l'Alleud, Belgium for the study of the effects of specific drugs on ionic currents of neurons in the cerebral cortex.
- Research project by the Italian Space Agency (ASI).
- Research project funded by the Telethon Foundation (Italy): "Functional studies of spinal motor neurons in a genetic model of Amyotrophic Lateral Sclerosis (ALS)".
- National scientific manager (5 research units) of a FIRB project for the study of ALS.
- Research contract from Pfizer, Italy and Angelini Acraf S.P.A., Pomezia (Rome) to study the effects of specific compounds on in vitro models of ALS.
- Research project by the Latran Foundation, France, to carry out electrophysiological studies on ALS models.
- Research project of the University of "Tor Vergata", carries out studies on the altered expression and function of ion channels in the CNS in ALS models.

Affiliation with Scientific Societies

Since 1992: Member of the Italian, European and American Society of Neuroscience

Since 1996: Member of the Italian Society of Physiology.

International Awards

Scientific reviewer for several qualified international journals and invited as a speaker at various international conferences.

Bibliometric indicators

She is the author over 80 scientific papers, all published in qualified international journals with high impact factor.

Main scientific publications in the last 10 years

1: Saba L, Viscomi MT, Martini A, Caioli S, Mercuri NB, Guatteo E, **Zona C**. Modified age-dependent expression of NaV1.6 in an ALS model correlates with motor cortex excitability alterations. *Neurobiol Dis*. 2019 Oct;130:104532. doi: 10.1016/j.nbd.2019.104532.

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- 18:** Venerosi A, Martire A, Rungi A, Pieri M, Ferrante A, **Zona C**, Popoli P, Calamandrei G. Complex behavioral and synaptic effects of dietary branched chain amino acids in a mouse model of amyotrophic lateral sclerosis. *Mol Nutr Food Res*. 2011 Apr;55(4):541-52. doi: 10.1002/mnfr.201000296. Epub 2011 Jan 5.
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- 21:** **Zona C**, Pieri M, Carunchio I, Curcio L, Klitgaard H, Margineanu DG. Brivaracetam (ucb 34714) inhibits Na(+) current in rat cortical neurons in culture. *Epilepsy Res*. 2010 Jan;88(1):46-54. doi: 10.1016/j.eplepsyres.2009.09.024. Epub 2009 Nov 13.
- 22:** Loizzo S, Pieri M, Ferri A, Carrì MT, **Zona C**, Fortuna A, Vella S. Dynamic NAD(P)H post-synaptic autofluorescence signals for the assessment of mitochondrial function in a neurodegenerative disease: monitoring the primary motor cortex of G93A mice, an amyotrophic lateral sclerosis model. *Mitochondrion*. 2010 Mar;10(2):108-14. doi: 10.1016/j.mito.2009.11.001.
- 23:** Mollinari C, Ricci-Vitiani L, Pieri M, Lucantoni C, Rinaldi AM, Racaniello M, De Maria R, **Zona C**, Pallini R, Merlo D, Garaci E. Downregulation of thymosin beta4 in neural progenitor grafts promotes spinal cord regeneration. *J Cell Sci*. 2009 Nov 15;122(Pt 22):4195-207. doi: 10.1242/jcs.056895.
- 24:** Armogida M, Giustizieri M, **Zona C**, Piccirilli S, Nisticò R, Mercuri NB. N-ethyl lidocaine (QX-314) protects striatal neurons against ischemia: an in vitro electrophysiological study. *Synapse*. 2010 Feb;64(2):161-8. doi: 10.1002/syn.20735.
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