

Monica DiLuca

Academic career

- Laurea cum laude in Chemistry and Pharmacology Technology, Faculty of Pharmacy, University of Milan - 110 lode/110 (1986)
- PhD in "Pharmacology", Faculty of Pharmacy, University of Milan (1992)
- PhD in Medical Sciences, School of Medicine, University of Utrecht (1993)

Professional experience

- Director, Dept of Pharmacological and Biomolecular Sciences, University of Milan (2020 -2026)
- Vice - Rector for International Strategies, University of Milan (2014 – 2018)
- Head of Laboratory of Pharmacology of neurodegeneration – DiSFeB, University of Milan
- Full Professor of Pharmacology - University of Milan (2011 - present)
- Associated Professor of Pharmacology - University of Milan (2000 - 2011)
- Assistant professor, Institute of Pharmacological Sciences University of Milan (1995 - 2000)

Honours and awards

- Doctor Honoris Causa University of Bordeaux (Oct 2019)
- Laurea Honoris Causa Faculty of Medicine and Pharmacy, Univ. of Mons, Belgium (March 2017)
- EMBO membership (2017)
- SinDEM Società Italiana Neurologia delle Demenze Honorary member (2022)
- Visiting professor at Liaoning Normal University, Dalian (2017)
- "Otto Creutzfeldt Lecture", 12th Goettingen Meeting of the German Neuroscience Society (2017)
- ENCP Media Award (2013)
- EDAB, European Dana Alliance Invited Member (2008)
- Award for Neuroscience - Italian Society for Neuroscience (1997)
- Award of the Faculty of Pharmacy, University of Milan for "Studies on neuronal plasticity" (1994)

Learned Societies and Boards-selected

- EBC - European Brain Council (Member of Advisory Board: 2003-2006; Vice-president: 2010-2016; President: 2017- 2021)
- IBRO, International Brain Organization (Chair of Western Europe Regional Committee: 2006-2010; Executive Director Inter-Regional activities: 2010-2014)
- FENS - Federation of European Neuroscience Societies (Member of Scientific Programme Committee: 1996-2000; General Secretary: 2000-2006; Member of Board Programme of European Neuroscience Schools, PENS: 2006-2010; President: 2014 - 2016)
- SfN - Society for Neuroscience (Member of Women in Neuroscience Committee: 2007 - 2010; Member of Professional Development Committee: 2009 - 2012)
- SINS - Società Italiana di Neuroscienze (Board Member 2001-2005; President 2024- oggi)
- SIF - Società Italiana di Farmacologia (Coordinator for "Regione Lombardia": 2007-oggi; Coordinator Group of Neurodegenerative Diseases: 2012; Board Member: 2013-2017)
- Board of Full Professors of Pharmacology, Secretary and treasurer: 2018
- Italian Interdisciplinary Network on Alzheimer Disease, ITINAD (Scientific Secretary: 1998-2001; Vice President: 2001-2009)
- University of Milan - National Coordinator Working Group CRUI H2020: 2012
- University of Milan - delegate at "The League of European Research Universities" (LERU): 2015 – 2018

Revision Panels-selected

MDL has served as member of several panels for the European Commission framework programmes 7 and H2020. In addition:

2006	Advisor for BBSRC (Biotechnology and biology Research Council) panel, UK
2009 -2010	AERES, Agence de l'Evaluation de la Recherche et des Etablissements d'Enseignement Supérieur, French Research Agency
2011	Member of Visiting Committee KU Leuven
2014-2016	Eric Kandel Young Neuroscientists Prize
2012-2016	FENS EJM Awards Evaluation Committee
2014-2016	IBRO-Kemali Prize
2014-2018	DANA Awards
2019-2022	Member of Lundbeckfonden's Grants & Prizes panel
2019-2025	Member of DZNE Senate
2019-2021	SfN Julius Axelrod Prize Selection Committee for Neuropharmacology
2021-2023	Scientific Advisory Board LIN Magdeburg
2021	Scientific Advisory Board of CINC (Madrid)
2021	Scientific Advisory Board MultiPark (Univ of Lund)
2021	Member of the Italian Delegation, Horizon Europe (Health Cluster), European Commission

Organizational Activities

2017	6th European Synapse Meeting - Milano, 4/6 December
2017	Cajal Advanced Programme in Neuroscience: Synapse Course - Bordeaux, 02/21 July
2016	10th FENS Forum, Copenhagen
2014	9th FENS Forum – Milan
2013	SIF (Società Italiana di Farmacologia) - "Alzheimer Disease: which are the challenges we need to face?" From basic mechanisms to genetic and translational aspects – Milan
2011	"The Synapse: From physiology to pathology" - Stresa, 4/7 September, Satellite of International Society of Neurochemistry" (ISN)
2006	FENS Forum - Vienna, 11/15 July
2004	Vice chair EURESCO conference on Learning and Memory – Obernai
2004	FENS Forum - Paris, 13/17 July
2002	FENS Forum - Lisbona, 10/14 July
1999	FENS Summer School on "Neurodegeneration and Regeneration: from basic to disease" – Elba
1998	Official Satellite of European Neuroscience Forum "Synaptic plasticity learning and memory" – Berlin
1998	"Federation of European Neuroscience Societies (FENS) Forum " - Berlin
1997	Elba Summer School of Neuroscience (ENA): "Degeneration and regeneration in the Nervous System: mechanisms and disease"

Editorial Activities

1998 - 2004	<i>Editor:</i> Neuroscience Research Communication
2000 - 2006	<i>Member of Publication Committee:</i> European J. Neuroscience
2007 -	<i>Editorial Board:</i> Pharmacological research
2007 -	<i>Editorial Board:</i> European J Pharmacology
2009 -	<i>Review Editor:</i> Frontiers in Synaptic Neuroscience
2011 - 2016	<i>Editorial Board:</i> Synapse
2016 -	<i>Editorial Board:</i> Neuroscience

Funding

- Italian Ministry of University and Research (FIS 2021, PRIN 2022, PRIN 2017, PRIN2015, PRIN2010-11, FIRB2011, PRIN2008, FIRB2003)
- Italian Ministry of Health (Min.San. 2019, 2016, 2010, 2008, 2004, 2002, 2000)
- CNR (1999, 1998, 1995)
- European Commission (HE: Eternity; H2020: EBRA-2019; H2020-MSCA-ITN-2015; JPco-fuND, STAD project 2016)
- FP7 SymbAD ITN; FP7 REPLACES Collaborative project; FP7 cPADS, IAPP project, FP6 SynScaff Collaborative projects)
- Foundations (Cariplo, IPSEN, Telethon, AlzOrg)

Patents

- European patent application EP 13196710.1 - 1456 (ADAM10 inhibition to treat Fragile X syndrome), registered on 11/12/2013
- International patent application n. PCT/IB2018/060511

Research interests

Monica DiLuca is the author of over 220 articles published in peer reviewed journals. Over the last ten years she has given over 60 invited lectures at international meetings or at universities in Europe, North America and Asia.

Monica DiLuca's primary research interest has been always related to neuronal and synaptic plasticity both in physiological and pathological conditions, with the primary aim to apply her basic findings to the cure of neurodegenerative diseases as Alzheimer (AD) and Parkinson Disease (PD). In this frame she was coordinator and partner of several EU funded projects starting from VI FP.

In addition, she consistently received funds from local institutions (Italian Ministry of University and Research (PRIN2017, PRIN2015, PRIN2010-11, FIRB2011, PRIN2008, FIRB2003) - Italian Ministry of Health (Min.San. 2016, 2010, 2008, 2004, 2002, 2000) - CNR (1999, 1998, 1995) and major national and international Foundations (Cariplo, IPSEN, Telethon, AlzOrg). She made significant contributions in generating the blue print of the molecular organization of synapses, increasing our knowledge on the series of protein-protein interactions between ionotropic glutamate receptors, their scaffolds, and mediators of signaling (J Neurochem, 1998; J Neurosci, 2001, 2007, 2009, 2010; JBC, 2001, 2003; FASEB J 2003; Nat Commun, 2015; eLife, 2016; iScience, 2019). Furthermore, she identified a key role for components of glutamatergic synapses in neurodegenerative diseases, particularly focusing on NMDAR complexes, showing that in mouse models for AD and PD, NMDAR composition in the postsynaptic density is dramatically altered (J Neurosci, 2004, 2006, 2009, 2010; NBD 2012, 2017, 2019). Furthermore, Monica DiLuca identified pillars of amyloid cascade in the core of the glutamatergic synapse, disclosing the synaptic localization and the mechanisms guiding local trafficking of the ADAM10 (J Neurosci, 2007; J Clin Inv, 2013; Neuron, 2015). Her discoveries enriched our understanding of glutamatergic synapse in physiology and pathology, increasing our knowledge on plasticity and memory and leading to new tools for neuroprotection (Patent, international application n. PCT/IB2018/060511). Her long-lasting dedication to understand mechanisms tuning neuronal and synaptic plasticity both in health and diseases lasted over 30 years. These discoveries have radically changed the understanding of Alzheimer disease pathogenesis, with far reaching ramifications for neuronal plasticity and memory as well as neuroprotection. These findings open new avenues to identify novel molecules targeting early synaptic dysfunction for pharmacological interventions in the still unresolved need of neurodegenerative diseases' treatment.

Major publications selection

- Amyloid precursor protein in platelets: a peripheral marker for the diagnosis of sporadic AD. *Padovani A, Pastorino L, Borroni B, Colciaghi F, Rozzini L, Monastero R, Perez J, Pettenati C, Mussi M, Parrinello G, Cottini E, Lenzi GL, Trabucchi M, Cattabeni F, DiLuca M. Neurology. 2001 Dec 26; 57(12): 2243-8.*
- Abnormal Ca²⁺-calmodulin-dependent protein kinase II function mediates synaptic and motor deficits in experimental parkinsonism. *Picconi B, Gardoni F, Centonze D, Mauceri D, Cenci MA, Bernardi G, Calabresi P, DiLuca M. J Neurosci. 2004 Jun 9;24(23):5283-91.*
- Synapse-associated protein-97 mediates alpha-secretase ADAM10 trafficking and promotes its activity. *Marcello E, Gardoni F, Mauceri D, Romorini S, Jeromin A, Epis R, Borroni B, Cattabeni F, Sala C, Padovani A, DiLuca M. J Neurosci. 2007 27(7):1682-91.*
- Decreased NR2B subunit synaptic levels cause impaired long-term potentiation but not long-term depression. *Gardoni F, Mauceri D, Malinverno M, Polli F, Costa C, Tozzi A, Siliquini S, Picconi B, Cattabeni F, Calabresi P, DiLuca M. J Neurosci. 2009 Jan 21;29(3):669-77.*
- Blocking ADAM10 synaptic trafficking generates a model of sporadic Alzheimer's disease. *Epis R, Marcello E, Gardoni F, Vastagh C, Malinverno M, Balducci C, Colombo A, Borroni B, Vara H, Dell'agli M, Cattabeni F, Giustetto M, Borsello T, Forloni G, Padovani A, DiLuca M. Brain. 2010 Nov;133(11):3323-35.*
- N-methyl-D-aspartate (NMDA) receptor composition modulates dendritic spine morphology in striatal medium spiny neurons. *Vastagh C, Gardoni F, Bagetta V, Stanic J, Zianni E, Giampà C, Picconi B, Calabresi P, DiLuca M. J Biol Chem. 2012 May 25;287(22):18103-14.*
- The neuropeptide PACAP38 induces dendritic spine remodeling through ADAM10-N-cadherin signaling pathway. *Gardoni F, Saraceno C, Malinverno M, Marcello E, Verpelli C, Sala C, DiLuca M. J Cell Sci. 2012 Mar 15;125(Pt 6):1401-6.*
- Endocytosis of synaptic ADAM10 in neuronal plasticity and Alzheimer's disease. *Marcello E, Saraceno C, Musardo S, Vara H, de la Fuente AG, Pelucchi S, Di Marino D, Borroni B, Tramontano A, Pérez-Otaño I, Padovani A, Giustetto M, Gardoni F, DiLuca M. J Clin Invest. 2013 Jun;123(6):2523-38.*
- Targeting glutamatergic synapses in Parkinson's disease. *Gardoni F, DiLuca M. Curr Opin Pharmacol. 2015 Feb;20:24-8.*
- Rabphilin 3A retains NMDA receptors at synaptic sites through interaction with GluN2A/PSD-95 complex. *Stanic J, Carta M, Eberini I, Pelucchi S, Marcello E, Genazzani AA, Racca C, Mülle C, DiLuca M, Gardoni F. Nat Commun. 2015 Dec 18;6:10181.*
- Ring finger protein 10 is a novel synaptonuclear messenger encoding activation of NMDA receptors in hippocampus. *Dinamarca MC, Guzzetti F, Karpova A, Lim D, Mitro N, Musardo S, Mellone M, Marcello E, Stanic J, Samaddar T, Burguière A, Caldarelli A, Genazzani AA, Perroy J, Fagni L, Canonico PL, Kreutz MR, Gardoni F, DiLuca M. Elife. 2016 Mar 15;5:e12430.*
- Synapse-to-nucleus communication: from developmental disorders to Alzheimer's disease. *Marcello E, DiLuca M, Gardoni F. Curr Opin Neurobiol. 2018 Feb;48:160-166.*
- Amyloid- β Oligomers Regulate ADAM10 Synaptic Localization Through Aberrant Plasticity Phenomena. *Marcello E, Musardo S, Vandermeulen L, Pelucchi S, Gardoni F, Santo N, Antonucci F, DiLuca M. Mol Neurobiol. 2019 Oct;56(10):7136-7143.*
- Cyclase-associated protein 2 dimerization regulates cofilin in synaptic plasticity and Alzheimer's disease. *Pelucchi S, Vandermeulen L, Pizzamiglio L, Aksan B, Yan J, Konietzny A, Bonomi E, Borroni B, Padovani A, Rust MB, Di Marino D, Mikhaylova M, Mauceri D, Antonucci F, Edefonti V, Gardoni F, DiLuca M, Marcello E. Brain Commun. 2020 Jun 26;2(2):fcaa086.*
- Protein-protein interactions at the NMDA receptor complex: From synaptic retention to synaptonuclear protein messengers. *Gardoni F, DiLuca M. Neuropharmacology. 2021 Jun 1;190:108551.*
- GluA3 autoantibodies induce alterations in dendritic spine and behavior in mice. *Scheggia D, Stanic J, Italia M, La Greca F, Zianni E, Benussi A, Borroni B, DiLuca M, Gardoni F. Brain Behav Immun. 2021 Oct;97:89-101.*

- The development of ADAM10 endocytosis inhibitors for the treatment of Alzheimer's disease. *Musardo S, Therin S, Pelucchi S, D'Andrea L, Stringhi R, Ribeiro A, Manca A, Balducci C, Pagano J, Sala C, Verpelli C, Grieco V, Edefonti V, Forloni G, Gardoni F, Meli G, Di Marino D, DiLuca M, Marcello E. Mol Ther. 2022 Jul 6;30(7):2474-2490.*
- Is amyloid involved in acute neuroinflammation? A CSF analysis in encephalitis. *Padovani A, Canale A, Schiavon L, Masciocchi S, Imarisio A, Risi B, Bonzi G, De Giuli V, DiLuca M, Ashton NJ, Blennow K, Zetterberg H, Pilotto A. Alzheimers Dement. 2022 Nov;18(11):2167-2175. doi: 10.1002/alz.12554.*
- Reciprocal cortico-amygdala connections regulate prosocial and selfish choices in mice. *Scheggia D, La Greca F, Maltese F, Chiacchierini G, Italia M, Molent C, Bernardi F, Coccia G, Carrano N, Zianni E, Gardoni F, DiLuca M, Papaleo F. Nat Neurosci. 2022 Nov;25(11):1505-1518.*
- Novel therapeutic approaches to target neurodegeneration. *De la Fuente AG, Pelucchi S, Mertens J, DiLuca M, Mauceri D, Marcello E. Br J Pharmacol. 2023 Jul;180(13):1651-1673.*