



**CRISTINA LANNI**  
Associate Professor

### ***Education/training***

- 1995: Classical Baccalaureate
- July 2000: Doctoral degree in Biological Science, University of Pavia.
- July 2005: Board Certification in Applied Pharmacology (medical area), University of Pavia.
- June 2006: Certificate of Higher Post Graduate Education for attendance at the "Scuola Avanzata di Formazione Integrata" (SAFI) of the Scuola Superiore IUSS from 2002 to 2005.
- October 2008: International Doctorate in Biomolecular Sciences and Biotechnology, University of Pavia.

### ***Positions and honors***

#### Professional Experience

- 2023, September: Qualification to the role of Full Professor in Pharmacology
- 2015, 1st August: Associate Professor in Pharmacology, University of Pavia
- 2008, 29th December: Assistant Professor in Pharmacology, University of Pavia
- 2005-2008: Biomolecular Sciences and Biotechnology Doctorate fellowship, University of Pavia, on the project "Alzheimer's disease, new diagnostic and therapeutic tools: focus on p53".
- 2004-2005: Recipient of fellowship, Department of Experimental and Applied Pharmacology, University of Pavia to the study of beta-amyloid peptide as therapeutic target in Alzheimer's disease.
- 2003-2004: Recipient of fellowship, "Istituto Neurologico Casimiro Mondino", Pavia, to the study of biological markers in Alzheimer's disease.
- 2001-2003: Recipient of fellowship, Department of Experimental and Applied Pharmacology, University of Pavia to the study of the role of beta-amyloid peptide.

#### Honors and Awards

- 2002 Neuropsychopharmacology Italian Society (SINPF) Poster Award for researches on the neuroprotection in Alzheimer's Disease
- 2003 Celltox (Associazione Italiana Tossicologia in vitro) Travel Award
- 2004 SAFI (Scuola Avanzata di Formazione Integrata) Study Award on CNS pathologies
- 2005 SAFI (Scuola Avanzata di Formazione Integrata) Study Award on CNS pathologies
- 2009 12<sup>th</sup> International Conference on Alzheimer's Disease (ICAD) Travel Fellowship
- 2019 PI\_Internal Quota ricerca FRG2019, Department of Drug Science, Pavia
- 2020 PI\_Internal Quota ricerca FRG2020, Department of Drug Science, Pavia
- 2020 Outstanding Reviewer Award - Certificate of Achievement Signal Transduction and Targeted Therapy (SpringerNature)
- 2023 Premio "Milano Cultura 2023" Ada Burrone alla solidarietà
- 2024 Premio "Alessandro Moretta" – Ambasciatori per la ricerca scientifica d'avanguardia

#### Memberships in Scientific Societies

Cristina Lanni is a member of Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), Italian Society for Pharmacology, Italian Society for Neuroscience and Italian Society of Neuropsychopharmacology. In addition, Cristina Lanni is included in the board of AMAE (Associazione Malati Acalasia Esofagea) Onlus ([www.amae.it](http://www.amae.it)) and to date she is the chairman of the scientific committee of this association, whose activities are focused on increasing awareness for the rare disease achalasia.

### Editorial Board

Associate Editor for Neurodegeneration - Frontiers in Neuroscience; Frontiers Topic Editor – Immune response modulation by nanoparticle formulations; Guest Associate Editor in Pharmacology of Anti-Cancer Drugs; Review Editor for Neurocognitive Aging and Behavior - Frontiers in Aging Neuroscience; Review Editor for Geriatric Medicine - Frontiers in Medicine

Reviewer for the following scientific journals: Signal Transduction and Targeted Therapy, Molecular Neurobiology, Scientific Reports, Frontiers in Pharmacology Experimental Pharmacology and Drug Discovery, Frontiers in Molecular Biosciences Molecular Diagnostics and Therapeutics, Journal of Neuroscience Methods, Brain Research Bulletin, Neurotoxicity Research, International Journal of Alzheimer's disease, Plos One, Pharmacological Research, Biology.

### **Teaching and organizing activities**

#### Teaching to undergraduate students at the University of Pavia

- Assigned courses in the 2013 - 2014 teaching programming: Pharmacognosy and Pharmacology (Medicinal Chemistry and Pharmaceutical Technology), Pharmacogenetics (Pharmacy and Medicinal Chemistry and Pharmaceutical Technology)
- Assigned course in the 2015 - 2016 teaching programming: Toxicology (Pharmacy)

#### Teaching to undergraduate students at the University School of Advanced Studies IUSS Pavia (IUSS-Pavia)

- 2009: Pharmacogenetics
- 2014-2019: Psychopharmacology

#### Teaching to graduate students at the University of Pavia

Assigned course in the 2020 - 2021 teaching programming: Pharmacology (Graduate School - medical area - Scuola di Specializzazione in Medicina dello Sport e dell'Esercizio Fisico)

Assigned course in the 2021 - 2022 teaching programming: Pharmacology (Graduate School - medical area - Scuola di Specializzazione in Farmacologia Clinica)

#### Organizing activities

- 2017-present: Vice Coordinator of the undergraduate courses in Pharmacy and in Medicinal Chemistry and Pharmaceutical Technology, University of Pavia.
- 2020: Teaching Board within the Master in Nanomedicine for Drug Delivery (Nanomed).
- 2021: Teaching Board within the Doctorate in Biomolecular Sciences and Biotechnology, University School of Advanced Studies IUSS Pavia (coordinator Prof. F. Forneris)

### **Research fields**

Cristina Lanni has a great expertise in the field of neurodegeneration and age-related disorders. At the beginning of her scientific career, she was initially oriented on the pathogenic mechanisms of Alzheimer's disease (AD), and in particular on the pharmacological regulation of amyloid precursor protein metabolism and on the neurotoxicity of beta-amyloid peptide (A $\beta$ ). Based on her background she took also part to different scientific collaborations, contributing in the scientific research with data on a dual role of A $\beta$  strictly correlated with its concentration (neuromodulatory/neuroprotective vs neurotoxic). In particular she focused on the molecular characterization of the hypothetical physiological effect of A $\beta$  on cellular network, by examining the physiological effects of A $\beta$  on acute synaptic activities and the functional interplay existing between A $\beta$  and different neurotransmitter systems. In understanding the etiopathogenesis of AD, Cristina Lanni has also participated to research new potential peripheral biomarkers for Alzheimer's disease, by characterizing and describing the modulation of the conformational state of p53 by physiological concentrations of A $\beta$ . At the moment, Cristina Lanni is researching on the bidirectional link between gastrointestinal inflammation and neurodegeneration, with particular attention to circadian clockwork modulation in the periphery and in the brain.

### **Research support**

- Funding "Young Investigator Award" at University of Pavia for the project "Lithium in Alzheimer's disease: protection against beta-amyloid-induced neurodegeneration" Goal: Characterization of lithium ability to rescue from beta-amyloid toxicity (12 months). Role: PI
- Grant PRIN 2007HJCCSF\_001 for the research "Beta amyloid, the culprit of Alzheimer's neurodegeneration or a new player in brain physiological and pathological neuromodulation?" Goal:

Evaluation of the in vitro effect of beta amyloid on dopamine release and on signal transduction machinery downstream presynaptic receptors controlling neurotransmitter release (24 months). Role: Participant.

- Funding "Progetto Regione Lombardia - Almamater" SAL45-17261, for the research "From materials sciences to development of new devices for the diagnosis and cure of aging related disorders" Goal: Dissection of the effect of A $\beta$  on p53 structure and functions (24 months). Role: Co-PI.

- Grant PRIN 2020SCBBN2\_005 for the research "Glymphatic system: a new player in the gut-brain axis. Natural resources to maintain homeostasis". Goal: To evaluate the relationship between gut dysbiosis and glymphatic system alteration and to characterize the healthy properties of a food supplement based on plant extracts for relieving gut disequilibrium and the associated disorders focusing on brain dysfunctions due to a deficient CSF diffusion and waste clearance (36 months). Role: Co-PI.

- National Grant: F13C22001110001\_ IMMUNO-HUB Ministero della Salute – Piano Operativo Salute, PSC. Traiettorie 4 – Interventi per la creazione di Hub delle Scienze della Vita nei settori della Farmaceutica, del Biomedicale e delle Biotecnologie (36 months). Role: Participant.

- Alzheimer Association Grant AARG-23-1140660 for the research «Misalignment in circadian glymphatic system as trigger of neurodegeneration» Goal: To establish the threshold (or time window) beyond which the glymphatic system impairment and pathological waste deposition, due to circadian misalignment, becomes irreversible and triggers neurodegenerative processes (36 months). Role: PI

#### **Total number of referred publications, H index, Number of citations**

Total number of referred publications: 89

H index: 37 (Scopus)

Number of citations: 3818 (Scopus)

**ORCID ID:** [orcid.org/0000-0002-3061-4738](https://orcid.org/0000-0002-3061-4738)

#### **Selected peer-reviewed publications**

1. Fagiani F, Fulop T, Govoni S, **Lanni C**. The Fuzzy Border between the Functional and Dysfunctional Effects of Beta-Amyloid: A Synaptocentric View of Neuron-Glia Entanglement. *Biomedicines*. 2023 Feb 8;11(2):484. doi: 10.3390/biomedicines11020484.
2. Basagni F, Naldi M, Ginex T, Luque FJ, Fagiani F, **Lanni C**, Iurlo M, Marcaccio M, Minarini A, Bartolini M, Rosini M. Inhibition of  $\beta$ -Amyloid Aggregation in Alzheimer's Disease: The Key Role of (Pro)electrophilic Warheads. *ACS Med Chem Lett*. 2022 Oct 10;13(11):1812-1818. doi: 10.1021/acsmchemlett.2c00410.
3. Fagiani F, Baronchelli E, Pittaluga A, Pedrini E, Scacchi C, Govoni S, **Lanni C**. The Circadian Molecular Machinery in CNS Cells: A Fine Tuner of Neuronal and Glial Activity With Space/Time Resolution. *Front Mol Neurosci*. 2022 Jul 1;15:937174. doi: 10.3389/fnmol.2022.937174.
4. Govoni S, Fagiani F, **Lanni C**, Allegri N. The Frailty Puzzle: Searching for Immortality or for Knowledge Survival? *Front Cell Neurosci*. 2022 Feb 17;16:838447. doi: 10.3389/fncel.2022.838447.
5. Fagiani F, Di Marino D, Romagnoli A, Travelli C, Voltan D, Mannelli LDC, Racchi M, Govoni S, **Lanni C**. Molecular regulations of circadian rhythm and implications for physiology and diseases. *Signal Transduct Target Ther*. 2022 Feb 8;7(1):41. doi: 10.1038/s41392-022-00899-y.
6. Fagiani F, Vlachou M, Di Marino D, Canobbio I, Romagnoli A, Racchi M, Govoni S, **Lanni C**. Pin1 as Molecular Switch in Vascular Endothelium: Notes on Its Putative Role in Age-Associated Vascular Diseases. *Cells*. 2021 Nov 24;10(12):3287. doi: 10.3390/cells10123287.
7. Fagiani F\*, **Lanni C\***, Racchi M, Govoni S. (Dys)regulation of Synaptic Activity and Neurotransmitter Release by  $\beta$ -Amyloid: A Look Beyond Alzheimer's Disease Pathogenesis.

- Front Mol Neurosci. 2021 Feb 24;14:635880. doi: 10.3389/fnmol.2021.635880. \*both authors equally contributed
8. Fagiani F, Catanzaro M, Buoso E, Basagni F, Di Marino D, Raniolo S, Amadio M, Frost EH, Corsini E, Racchi M, Fulop T, Govoni S, Rosini M, **Lanni C**. Targeting Cytokine Release Through the Differential Modulation of Nrf2 and NF- $\kappa$ B Pathways by Electrophilic/Non-Electrophilic Compounds. *Front Pharmacol*. 2020 Aug 14;11:1256. doi: 10.3389/fphar.2020.01256.
  9. Fagiani F\*, **Lanni C\***, Racchi M, Govoni S. Targeting dementias through cancer kinases inhibition. *Alzheimers Dement (N Y)*. 6(1):e12044; 2020 doi: 10.1002/trc2.12044. \*both authors equally contributed
  10. Catanzaro M, Fagiani F, Racchi M, Corsini E, Govoni S, **Lanni C**. Immune response in COVID-19: addressing a pharmacological challenge by targeting pathways triggered by SARS-CoV-2. *Signal Transduct Target Ther*. 5(1):84; 2020. doi: 10.1038/s41392-020-0191-1.
  11. **Lanni C**, Masi M, Racchi M, Govoni S. Cancer and Alzheimer's disease inverse relationship: an age-associated diverging derailment of shared pathways. *Mol Psychiatry*. 2020 doi: 10.1038/s41380-020-0760-2.
  12. Serafini MM, Catanzaro M, Fagiani F, Simoni E, Caporaso R, Dacrema M, Romanoni I, Govoni S, Racchi M, Daglia M, Rosini M, **Lanni C**. Modulation of Keap1/Nrf2/ARE Signaling Pathway by Curcuma- and Garlic-Derived Hybrids. *Front Pharmacol*. 10:1597; 2020. doi: 10.3389/fphar.2019.01597.
  13. Fagiani F\*, **Lanni C\***, Racchi M, Pascale A, Govoni S. Amyloid- $\beta$  and Synaptic Vesicle Dynamics: A Cacophonous Orchestra. *J Alzheimers Dis*. 72(1):1-14; 2019. doi: 10.3233/JAD-190771. \*both authors equally contributed
  14. Basagni F, **Lanni C**, Minarini A, Rosini M. Lights and shadows of electrophile signaling: focus on the Nrf2-Keap1 pathway. *Future Med Chem*. 11(7):707-721; 2019. doi: 10.4155/fmc-2018-0423.
  15. **Lanni C**, Fagiani F, Racchi M, Preda S, Pascale A, Grilli M, Allegri N, Govoni S. Beta-amyloid short- and long-term synaptic entanglement. *Pharmacol Res*. 139:243-260; 2019. doi: 10.1016/j.phrs.2018.11.018.
  16. Catanzaro M, Corsini E, Rosini M, Racchi M, **Lanni C**. Immunomodulators Inspired by Nature: A Review on Curcumin and Echinacea. *Molecules*. 23(11):2778; 2018. doi: 10.3390/molecules23112778.
  17. Bisceglia F, Natalello A, Serafini MM, Colombo R, Verga L, **Lanni C**, De Lorenzi E. An integrated strategy to correlate aggregation state, structure and toxicity of A $\beta$  1-42 oligomers. *Talanta*. 188:17-26; 2018. doi: 10.1016/j.talanta.2018.05.062.
  18. Serafini MM, Catanzaro M, Rosini M, Racchi M, **Lanni C**. Curcumin in Alzheimer's disease: Can we think to new strategies and perspectives for this molecule? *Pharmacol Res*. 124:146-155; 2017. doi: 10.1016/j.phrs.2017.08.004.
  19. Simoni E, Serafini MM, Caporaso R, Marchetti C, Racchi M, Minarini A, Bartolini M, **Lanni C**, Rosini M. Targeting the Nrf2/Amyloid-Beta Liaison in Alzheimer's Disease: A Rational Approach. *ACS Chem Neurosci*. 8(7):1618-1627; 2017. doi: 10.1021/acscchemneuro.7b00100.
  20. Govoni S, Mura E, Preda S, Racchi M, **Lanni C**, Grilli M, Zappettini S, Salamone A, Olivero G, Pittaluga A, Marchi M. Dangerous Liaisons between Beta-Amyloid and Cholinergic Neurotransmission. *Curr Pharm Des*. 20(15):2525-38; 2014.
  21. **Lanni C**, Necchi D, Pinto A, Buoso E, Buizza L, Memo M, Uberti D, Govoni S, Racchi M. Zyxin is a novel target for  $\beta$ -amyloid peptide: characterization of its role in Alzheimer's pathogenesis. *J Neurochem*. 125(5):790-9; 2013.
  22. **Lanni C**, Racchi M, Memo M, Govoni S, Uberti D. p53 at the crossroads between cancer and neurodegeneration. *Free Radic Biol Med*. 52(9):1727-33; 2012.
  23. Mura E, Zappettini S, Preda S, Biundo F, **Lanni C**, Grilli M, Cavallero A, Olivero G, Salamone A, Govoni S, Marchi M. Dual effect of beta-amyloid on  $\alpha$ 7 and  $\alpha$ 4 $\beta$ 2 nicotinic receptors controlling the release of glutamate, aspartate and GABA in rat hippocampus. *PLoS One*. 7(1):e29661; 2012.

24. Stanga S, **Lanni C**, Govoni S, Uberti D, D'Orazi G, Racchi M. Unfolded p53 in the pathogenesis of Alzheimer's disease: is HIPK2 the link? *Aging (Albany NY)* 2(9):545-54; 2010.
25. Buoso E, **Lanni C**, Schettini G, Govoni S, Racchi M. beta-Amyloid precursor protein metabolism: focus on the functions and degradation of its intracellular domain. *Pharmacol Res.* 62(4):308-17; 2010.
26. **Lanni C**, Nardinocchi L, Puca R, Stanga S, Uberti D, Memo M, Govoni S, D'Orazi G, Racchi M. Homeodomain interacting protein kinase 2: a target for Alzheimer's beta amyloid leading to misfolded p53 and inappropriate cell survival. *PLoS One.* 2010 A;5(4):e10171.
27. Mura E, **Lanni C**, Preda S, Pistoia F, Sarà M, Racchi M, Schettini G, Marchi M, Govoni S. Beta-Amyloid: A Disease Target or a Synaptic Regulator Affecting Age-Related Neurotransmitter Changes? *Curr Pharm Des.* 16(6):672-83; 2010.
28. Mura E, Preda S, Govoni S, **Lanni C.**, Trabace L, Grilli M, Lagomarsino F, Pittaluga A, Marchi M. Specific Neuromodulatory Actions of Amyloid-beta on Dopamine Release in Rat Nucleus Accumbens and Caudate Putamen. *J Alzheimers Dis.* 19(3):1041-53; 2010.
29. Colombo R, Carotti A, Catto M, Racchi M, **Lanni C**, Verga L, Caccialanza G, De Lorenzi E. CE can identify small molecules that selectively target soluble oligomers of amyloid beta protein and display antifibrillogenic activity. *Electrophoresis,* 30(8):1418-29, 2009.
30. **Lanni C**, Racchi M, Mazzini G, Ranzenigo A, Polotti R, Sinforiani E, Olivari L, Barcikowska M, Styczynska M, Kuznicki J, Szybinska A, Govoni S, Memo M, Uberti D. Conformationally altered p53: a novel Alzheimer's disease marker? *Mol Psychiatry,* 13(6): 641-647; 2008.

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*Antonio Reun*