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Isabella Barbiero

Date of birth: 17/03/1986 | **Nationality:** Italian | **Phone:** (+39) 0331339407 (Mobile) | **Email address:** i.barbiero@uninsubria.it | **Indirizzo** Via Manara 7, 21052, Busto Arsizio (Va), Italia (Lavoro)

WORK EXPERIENCE

01/03/2023 - CURRENT - VARESE, ITALY

ASSISTANT PROFESSOR UNIVERSITY OF INSUBRIA

Activities

- **Professor** of the *RNA-Based Experimental Approaches* course within the Master's Degree Program in Biomedical Sciences.
- **Teaching assistant** in the *Molecular Biology Laboratory* within the Bachelor's Degree Program in Biological Sciences at the University of Insubria, under the coordination of Prof. Charlotte Kilstrup-Nielsen.
- **Member of the examination board** for the following courses at the University of Insubria (coordination: Prof. Charlotte Kilstrup-Nielsen):

-*Epigenetic Control of Gene Expression* (Master's Degree Program in Biomedical Sciences)

-*Molecular Biology* (Bachelor's Degree Program in Biological Sciences).

15/01/2019 - 15/02/2019 - DUBLIN, IRELAND

VISITING SCIENTIST TRINITY COLLEGE

Activities:

Acquisition and application of molecular approaches for the analysis of microtubule post-translational modifications.

01/2016 - 28/02/2023 - BUSTO ARSIZIO (VA), ITALY

POSTDOCTORAL RESEARCHER UNIVERSITY OF INSUBRIA. LABORATORY OF MOLECULAR NEUROBIOLOGY

Activities: application of molecular, cellular, animal and informatic skills for carrying out laboratory projects.

Contribution to grant applications.

Supervision of 1st level, 2nd level and PhD students.

10/2012 - 10/2015 - BUSTO ARSIZIO, ITALY

PHD STUDENT UNIVERSITY OF INSUBRIA. LABORATORY OF MOLECULAR NEUROBIOLOGY

Activities: application of molecular, cellular, animal and computer skills for the realization of the doctoral project.

Supervision of 1st level and 2nd level students.

EDUCATION & TRAINING

10/2012 - 10/2015 - VARESE, ITALY

PHD IN NEUROBIOLOGY - UNIVERSITY OF INSUBRIA, FACULTY OF MATHEMATICAL, PHYSICAL AND NATURAL SCIENCES.

Project: “A novel role of CDKL5 in the regulation of mitotic spindle assembly and microtubule organization”. Advisor: Prof. Daniela Parolaro

07/2012 - VARESE, ITALY

M.SC. IN BIOLOGY APPLIED TO BIOMEDICAL RESEARCH. - UNIVERSITY OF INSUBRIA, FACULTY OF MATHEMATICAL, PHYSICAL AND NATURAL SCIENCES.

Thesis: “Cdkl5 and Mecp2: two genes and a partially common neuronal pathology. Molecular mechanisms involved.Supervisor: Prof. Nicoletta Landsberger

Final grade: 110/110 summa cum laude

02/2009 - VARESE, ITALY

B.SC. IN MOLECULAR BIOLOGY - UNIVERSITY OF INSUBRIA, FACULTY OF MATHEMATICAL, PHYSICAL AND NATURAL SCIENCES.

Thesis: “Cdkl5: functional characteritation of Rett mutants”. Supervisor: Prof. Charlotte Kilstrup-Nielsen

Final grade: 102/110

07/2005 - GALLARATE (VA), ITALY

HIGH SCHOOL DEGREE - LICEO SCIENTIFICO LEONARDO DA VINCI

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B1	C2	B2	B2	B2

HONOURS AND AWARDS

Honours and awards 2019: “10th international meeting steroids and nervous system” fellowship Turin, Italy.

2018: Selected candidate for “Cdkl5 forum junior award”(on behalf of the Loulou foundation).

2013: Francesco de Luca international master thesis prize. Rotary club Sesto Calende Angera

PROJECT COORDINATION

Project coordination

1.PI: Progetto Cariplo–Telethon Alliance GJC25F077

Titolo: “CCK+ interneurons in CDKL5 deficiency disorder: characterization of the InSyn1-DGC complex in early brain maturation.”

N° progetto:GJC25F077

Importo: €227,350.00

Periodo: dal 12/2025

2. PI: FAR Project 2023 (Fund for Fixed-Term Researchers)

Title: *“Gut deficits in CDKL5 deficiency disorder: analysis of the CLIP170–IQGAP1–NINEIN complex in microtubule organization and cellular adhesion of the intestinal epithelial barrier”*

Funding amount: €25,000

Period: 05/02/2024 – present

3. PI: Bank of Italy Project 2023

Title: *"Generation and morpho-functional analysis of neuronal and cellular models carrying pathological mutations in the CDKL5 gene"*

Project number: 2203193/23

Funding amount: €30,000

Period: 21/12/2023 – present

4. PI: Cariplo–Telethon Alliance GJC2021 Project

Title: *"Functional characterization of the InSyn1–CDKL5 interaction for dystrophin/dystroglycan complex–dependent inhibitory synapse formation"*

Project number: GJC21015

Funding amount: €190,410

Period: 01/07/2022-30/06/2025

5. PI: Senior Research Fellowship 2020–2021 (awarded following a competitive selection process)

Title: *"CDKL5 and microtubule-based transport: focus on CLIP170-mediated Dynactin–Dynein complex formation"*

Funding body: University of Insubria

Funding amount: €19,367

Period: 01/12/2020 – 30/11/2021

6. PI: Senior Research Fellowship 2018–2019 (awarded following a competitive selection process)

Title: *"The IQGAP1–CLIP170–PSD95 connection: towards an understanding of the molecular basis of CDKL5-related spine defects"*

Funding body: University of Insubria

Funding amount: €19,367

Period: 01/05/2018 – 30/04/2019

JOB-RELATED SKILLS

Job-related skills

Technical skills:

Molecular Biology skills: design and validation of short hairpin RNA, use of small interfering RNA, design and use of RNA guides for experiments based on the use of the CRISPR-Cas9 system, plasmid preparation, ligation, transformation, genomic DNA extraction, total RNA extraction, agarose gel electrophoresis, site-directed mutagenesis, PCR, qRT-PC, next generation sequencing (Illumina).

Cell and protein biology skills: cell culture, primary neuronal culture, transfection, transformation, protein interaction and purification assays, Western Blot, fluorescence microscopy, live cell imaging, immunofluorescence, lentivirus production, centrosome purification, synaptosomal preparation.

Animal handling skills: Familiarity with mouse colony management and related procedures, including plug determination to assess pregnancy status, genotyping, dissection.

Statistical skills: collection, organization, analysis and interpretation of numerical data. Digital skills: Microsoft Office, Photoshop, Graphpad, ImageJ.

COURSES

Courses

2022: DM 5 AUGUST 2021 RODENTS AND LAGOMORPHS. IZSLER.

2022: NATIONAL LEGISLATION AND ETHICS LEVEL 1, MODULES 1 AND 2, DM 5 AUGUST 2021. IZSLER.

2014: Summer school. Neural Circuit Development and Plasticity. Organiser: Prof. Dr. Casper HoogenraadUtrecht, Netherlands.

ORGANISATIONAL SKILLS

Organisational skills

Good organizational skills. Good experience in creating and managing projects. Contribution to the development and maintenance of collaborations with other research groups.

PUBLICATIONS

1. Baldin S, Carmone C, Valetti G, De Rosa R, Barbiero I. (2025)
CDKL5 regulates the initiation of retrograde axonal transport through CLIP170-dynactin complex formation. FEBS J. 2025 Aug 23. doi: 10.1111/febs.70230. Epub ahead of print. PMID: 40847610.

2. De Rosa R, Valastro S, Cambria C, Barbiero I, et al., (2023)
Loss of CDKL5 causes synaptic GABAA-receptor defects that can be restored with the neuroactive steroid pregnenolone-methyl-ether. Int J Mol Sci. 2022 Dec 21;24(1):68. doi: 10.3390/ijms24010068.

3. Barbiero, I*., Zamberletti, E., Tramarin, M., Gabaglio, M., Peroni et al., (2022)
Pregnenolone-methyl-ether enhances CLIP170 and microtubule functions improving spine maturation and hippocampal deficits related to CDKL5 deficiency. Human molecular genetics. https://doi.org/10.1093/hmg/ddac067 (*co-correspondig author).

4. Barbiero, I., Bianchi, M., & Kilstrup-Nielsen, C. (2022)
Therapeutic potential of pregnenolone and pregnenolone methyl ether on depressive and CDKL5 deficiency disorders: Focus on microtubule targeting. Journal of neuroendocrinology, 34(2), e13033. https://doi.org/10.1111/jne.13033.

5. Trovò, L., Fuchs, C., De Rosa, R., Barbiero, I., Tramarin et al., (2020).
The green tea polyphenol epigallocatechin-3-gallate (EGCG) restores CDKL5-dependent synaptic defects in vitro and in vivo. Neurobiology of disease, 138, 104791. https://doi.org/10.1016/j.nbd.2020.104791.

6. Barbiero, I., Peroni, D., Siniscalchi, P., Rusconi, L., Tramarin, M., P., et al., (2020).
Pregnenolone and pregnenolone-methyl-ether rescue neuronal defects caused by dysfunctional CLIP170 in a neuronal model of CDKL5 Deficiency Disorder. Neuropharmacology, 164, 107897. https://doi.org/10.1016/j.neuropharm.2019.107897.

7. Barbiero, I., De Rosa, R., & Kilstrup-Nielsen, C. (2019).
Microtubules: A Key to Understand and Correct Neuronal Defects in CDKL5 Deficiency Disorder?. International journal of molecular sciences, 20(17), 4075. https://doi.org/10.3390/ijms20174075.

8. Zamberletti, E., Gabaglio, M., Piscitelli, F., Brodie, J. S...Barbiero et al., (2019).
Cannabidivarin completely rescues cognitive deficits and delays neurological and motor defects in male Mecp2 mutant mice. Journal of psychopharmacology (Oxford, England), 33(7), 894–907. https://doi.org/10.1177/0269881119844184.

9. Tramarin, M., Rusconi, L., Pizzamiglio, L., Barbiero, I., Peroni, D., et al., (2018).
The antidepressant tianeptine reverts synaptic AMPA receptor defects caused by deficiency of CDKL5. Human molecular genetics, 27(12), 2052–2063. https://doi.org/10.1093/hmg/ddy108.

10. Barbiero, I., Peroni, D., Tramarin, M., Chandola, C., Rusconi, L., et al., (2017).
The neurosteroid pregnenolone reverts microtubule derangement induced by the loss of a functional

CDKL5-IQGAP1 complex. Human molecular genetics, 26(18), 3520–3530. https://doi.org/10.1093/hmg/ddx237.

11. Barbiero, I., Valente, D., Chandola, C., Magi, F., Bergo, A., et al., (2017).
CDKL5 localizes at the centrosome and midbody and is required for faithful cell division. Scientific reports, 7(1), 6228. https://doi.org/10.1038/s41598-017-05875-z.

12. Stefanelli, G., Gandaglia, A., Costa, M., Cheema, M. S...Barbiero, I. et al., (2016).
Brain phosphorylation of MeCP2 at serine 164 is developmentally regulated and globally alters its chromatin association. Scientific reports, 6, 28295. https://doi.org/10.1038/srep28295.

13. La Montanara, P., Rusconi, L., Locarno, A., Forti, L., Barbiero, I., et al. (2015).
Synaptic synthesis, dephosphorylation, and degradation: a novel paradigm for an activity-dependent neuronal control of CDKL5. The Journal of biological chemistry, 290(7), 4512–4527. https://doi.org/10.1074/jbc.M114.589762.

14. Bergo, A., Strollo, M., Gai, M., Barbiero, I., Stefanelli, G., Sertic, S., et al. (2015).
Methyl-CpG binding protein 2 (MeCP2) localizes at the centrosome and is required for proper mitotic spindle organization. The Journal of biological chemistry, 290(6), 3223–3237. https://doi.org/10.1074/jbc.M114.608125.

15. Bellini, E., Pavesi, G., Barbiero, I., Bergo, A., Chandola, C., Nawaz, M. S., et al. (2014).
MeCP2 post-translational modifications: a mechanism to control its involvement in synaptic plasticity and homeostasis?. Frontiers in cellular neuroscience, 8, 236. https://doi.org/10.3389/fncel.2014.00236.

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Busto Arsizio, 10/12/2025