

**Date of birth:** 28/09/1991

**Place of birth:** Napoli, Italy

**Nationality:** Italian

**Gender:** Female

## Contact

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Bologna, Italy (**Home**)

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## ABOUT MYSELF

PhD researcher and laboratory professional specialised in mechanistic toxicology and *in vitro* approaches for the study of environmental contaminants.

## WORK EXPERIENCE

### ARPAE Emilia-Romagna – Environment and Health Thematic Centre Bologna, Italy

**Department:** Toxicology and Molecular Epidemiology Unit | **Email:** [gpillo@arpae.it](mailto:gpillo@arpae.it)

### Research Technician – Molecular & Environmental Toxicology 01/03/2020 - Current

I work within the Molecular and Environmental Toxicology Unit, part of ARPAE's regional laboratory network and the Multisite Laboratory System. The Unit applies advanced molecular methods for environmental and microbiological monitoring, supporting prevention-oriented and sustainability-focused public health policies by linking environmental quality with human health protection.

Working in a multidisciplinary team integrating toxicology, molecular biology and environmental health, I contribute to institutional and inter-agency projects on molecular mechanisms of toxicity and carcinogenicity induced by environmental contaminants. My activities include the design and execution of *in vitro* experiments (Cell Transformation Assay, immunofluorescence, cytotoxicity testing), nucleic acid extraction from complex matrices and transcriptomic analyses.

I contribute to mechanistic evaluation of environmental contaminants (e.g. PFAS, phthalates, benzo[a]pyrene, particulate matter, ammonium salts, electromagnetic fields) and support molecular workflows for wastewater-based epidemiology, including development of NGS protocols (Illumina MiSeq) and ddPCR assays for microbiological characterisation and antimicrobial resistance analysis. I am also involved in workflow organisation, instrumentation management (monitoring, maintenance planning) and optimisation of laboratory procedures. I serve as archivist for the GLP-aligned testing facility (*CdS Vitrox*, formerly part of the NETVAL network and recently suspended), ensuring compliant documentation, traceability and archiving. Additional responsibilities include data analysis and the preparation of scientific and technical reports.

### Selected Projects

- Regional One Health Genomic Observatory / PrCAR (ongoing): development of NGS workflows for antimicrobial resistance characterisation.
- CCM 2023-ongoing: wastewater surveillance of respiratory viruses (ddPCR, sequencing).
- PhD project (2021-2024) on Non-Animal Testing approaches for next-generation NGTx carcinogenesis assessment.
- CEM Project (2022-2025): *in vitro* and transcriptomic studies on electromagnetic field exposure.
- Aria e Salute (2022-2025): microarray and immunofluorescence analyses on ammonium salts and air pollutants.
- SARI – National Wastewater Surveillance (from 2020): molecular detection of SARS-CoV-2 in wastewater.

- Pulvirus (2020–2022): interaction between air pollution and SARS-CoV-2.
- RIAS (2019–2021): support to environment–health initiatives.
- PAMPER (2018–2021): mechanistic evaluation of PFAS toxicological behaviour.
- AWAIR (2017–2020): toxicogenomics and cell transformation studies on air pollution health effects.

## ● **ARPAE Emilia-Romagna – Environment and Health Thematic Centre** Bologna, Italy

**Department:** Environmental Toxicology Unit – Vitrox In Vitro Testing Facility

### **Research Consultant (Short-term Contract)**

27/09/2019 - 27/11/2019

Contributed to ongoing in vitro toxicology and carcinogenesis research activities, performing cell culture experiments and supporting Cell Transformation Assays (CTA). Assisted in data collection, preliminary analysis and preparation of technical documentation.

## ● **European Commission – Joint Research Centre (JRC)** Ispra, Va, Italy

**Department:** EU Reference Laboratory for Alternatives to Animal Testing (EURL ECVAM), Unit F3

### **Scientific Trainee – Toxicity Data Integration**

16/03/2019 - 15/08/2019

Supported the F3 Unit (EURL ECVAM) within the project “Emerging methodologies for chemical sustainability”, performing structured review and mapping of OECD Test Guidelines and mechanistic data relevant to carcinogenicity assessment. This analytical work contributed to the publication Madia & Pillo et al., 2021 (Archives of Toxicology).

## ● **University of Bologna – ARPAE Emilia-Romagna** Bologna, Italy

**Department:** UNIBO Cancer Research Centre - ARPAE ER Environmental Toxicology Unit

### **Postgraduate Research Intern**

19/11/2018 - 15/03/2019

Postgraduate Internship promoted by the University of Bologna and hosted at ARPAE Emilia-Romagna. Contributed to laboratory research activities in in vitro toxicology and carcinogenesis, performing cell culture and molecular biology techniques under supervision. Participated in data collection, documentation and literature review activities, and collaborated with the Interdepartmental Cancer Research Centre “Giorgio Prodi” (CIRC) on projects involving non-animal methods and mechanistic approaches to carcinogenicity.

## EDUCATION & TRAINING

**10/11/2021 - 10/04/2025** Bologna, Italy

### ● **PhD in Oncology, Hematology and Pathology** Alma Mater Studiorum University of Bologna

PhD research focused on the development and application of alternative in vitro approaches for carcinogenicity assessment, with emphasis on non-genotoxic mechanisms. Using the BALB/c 3T3 A31-1-1 model, I applied the Cell Transformation Assay (CTA) integrated with mechanistic analyses to evaluate di-(2-ethylhexyl) phthalate (DEHP) and perfluorooctane sulfonic acid (PFOS). Transcriptomic analyses were conducted to characterise molecular pathways perturbed by DEHP exposure, while receptor-mediated mechanisms were explored for PFOS through PPAR $\alpha$  inhibition studies. The work contributed to the mechanistic characterisation of these compounds and supports integrated in vitro and omics-based approaches within next-generation risk assessment frameworks.

**Final grade:** Excellent | **Level in EQF:** EQF level 8 | **Thesis:** Use of in vitro alternative methods in the study of emerging contaminants for identifying mechanisms of action in non-genotoxic carcinogenesis

**Link:** <https://amsdottorato.unibo.it/id/eprint/12137/>

**11/06/2021 - 18/06/2021** Bologna, Italy

### ● **Summer School Environmental Health** Alma Mater Studiorum University of Bologna

Advanced training on environmental exposure to chemical, biological and physical agents, with focus on human health risk assessment methodologies and exposure evaluation techniques. The programme integrated toxicology, epidemiology and public health perspectives, including case studies and practical

exercises in environmental risk evaluation.

**Level in EQF:** EQF level 7

**21/05/2019 - 24/05/2019** Ispira, VA, Italy

● **JRC Summer School 2019: Non-Animal Approaches in Science Challenges & Future Directions**

European Commission's Joint Research Centre - Unit F.3, Chemical Safety and Alternative Methods

Training focused on non-animal methods in toxicology and regulatory science, covering advanced in vitro techniques, computational modelling and the Three Rs framework. Activities included expert-led sessions and presentation of individual research work, including Poster 086: *"Comparative evaluation of systemic endpoints: the case of carcinogenicity"* (G. Pillo, P. Prieto, F. Madia).

**Level in EQF:** EQF level 7

**18/06/2019 - 21/06/2019** Bologna, Italy

● **Professional Qualification as Biologist (Italian State Examination)** Italian Ministry of University and Research (MIUR) – University of Bologna

Qualification obtained after passing the Italian State Examination, enabling professional practice as a Biologist under Italian law. Registered Biologist (Section A), Order of Biologists of Marche and Emilia Romagna.

**10/10/2015 - 11/07/2018** Bologna, Italy

● **Master's Degree in Biodiversity and Evolution (LM-6, 2nd Level Degree)** University of Bologna, Italy

Advanced training in evolutionary and molecular biology with integration of biodiversity and environmental sciences. Thesis work focused on toxicogenomics investigation of benzo[a]pyrene (BaP), including in vitro assays, cytotoxicity testing and microarray-based gene expression analysis.

**Final grade:** 110/110 Cum Laude | **Level in EQF:** EQF level 7 | **Thesis:** Use of the "Transformics Assay" to identify molecular and cellular events associated with Benzo(a)pyrene exposure

Bologna, Italy

● **Degree in Natural Science L-32 – 1st level degree in Environmental sciences** Alma Mater Studiorum University of Bologna

Interdisciplinary scientific training covering biology, chemistry, physics, earth sciences, and statistics, providing solid foundations for subsequent specialization in molecular and environmental sciences.

**Final grade:** 110/110 Cum Laude | **Level in EQF:** EQF level 6

## LANGUAGE SKILLS

**MOTHER TONGUE(S):** Italian

**OTHER LANGUAGE(S):**

English

**Listening** B2

**Reading** B2

**Writing** B2

**Spoken production** B2

**Spoken interaction** B2

## LANGUAGE CERTIFICATIONS

● **English Language Certifications**

- **English Language Assessment Test – B2 (CEFR)**, University Language Centre, University of Bologna – 2022
- **IELTS Academic** – 2017
- **Cambridge First Certificate in English (FCE)** – University of Cambridge

## TECHNICAL AND LABORATORY EXPERTISE

### Laboratory techniques and training

- Mammalian cell culture and maintenance (e.g. Balb/c 3T3 A31-1-1, A549, T47D, U87 MG)
- Cell Transformation Assay (CTA)
- Immunofluorescence and fluorescence microscopy
- Cytotoxicity and cell viability assays
- Mycoplasma contamination testing in mammalian cell cultures
- Nuclear staining and imaging using Hoechst dye
- DNA/RNA extraction and purification from mammalian cells and environmental matrices
- Droplet Digital PCR (ddPCR) quantitative molecular analyses
- Microarray-based gene expression profiling
- Implementation of next-generation sequencing workflows (Illumina MiSeq), including targeted enrichment panels and gene assembly approaches for antimicrobial resistance characterisation

### Official training

- Illumina RNA Prep with Enrichment – Illumina Inc. (2025)
- Technical training on Illumina MiSeq sequencing platform (2022)
- Training on Droplet Digital PCR (ddPCR) systems (2022)
- Training on Maxwell Promega automated nucleic acid extraction systems (2022)
- Biosafety Level 3 (BSL-3) laboratory training (2021)
- Good Laboratory Practice (GLP) annual refresher
- Training on Tecan Spark microplate reader systems (2021)

### Data Analysis & Software

- Statistical data analysis (GraphPad Prism, Microsoft Excel; basic R)
- Gene expression data analysis (Agilent GeneSpring GX; Agilent Feature Extraction)
- Pathway and network analysis (MetaCore)
- Submission and annotation of transcriptomic datasets (ArrayExpress, Annotare)
- NGS run monitoring and data handling (Illumina BaseSpace)
- ddPCR data processing and quality assessment (Bio-Rad QX Software)
- Toxicological and biomedical databases (PubMed, ToxNet, HSDB, ArrayExpress)
- Scientific illustration and presentation (BioRender)

### Laboratory Operations & Workflow Management

- Planning and coordination of multi-step in vitro experimental workflows (cell preparation, treatment scheduling, sample processing, downstream analyses)
- Optimisation and troubleshooting of laboratory procedures
- Reagent inventory management (tracking, stock control, procurement support)
- Scheduling and maintenance planning for laboratory instrumentation
- Updating and implementation of SOPs and data analysis protocols
- Preparation, revision and documentation of experimental and analytical procedures
- Support to GLP-aligned quality workflows (labelling, sample and reagent traceability, structured documentation and reporting)

## COMMUNICATION & SCIENTIFIC REPORTING

### Scientific Communication Activities

- Preparation of clear experimental documentation and structured reporting for internal project activities
- Contribution to written study summaries and data interpretation notes
- Presentation of experimental results during internal lab meetings and small-group scientific discussions
- Preparation of scientific figures and graphical materials for presentations (BioRender)
- Contribution to internal training activities as tutor, supporting colleagues

## DRIVING LICENCE

Driving licence: B

26/01/2021 - 28/09/2031

## PUBLICATIONS

### Peer-reviewed articles

1. **Pillo G.**, Aldrovandi F., Mescoli A., et al. (2024). *An insight into carcinogenic activity and molecular mechanisms of Bis(2-ethylhexyl) phthalate*. *Frontiers in Toxicology*, 6:1389160.
2. Vaccari M., Serra S., Ranzi A., et al. (2024). *In vitro evaluation of the carcinogenic potential of perfluorinated chemicals*. *ALTEX – Alternatives to Animal Experimentation*.
3. **Pillo G.**, Mascolo M.G., Zanzi C., et al. (2022). *Mechanistic Interrogation of Cell Transformation In Vitro: The Transformics Assay as an Exemplar of Oncotransformation*. *International Journal of Molecular Sciences*, 23, 7603.
4. Madia F., **Pillo G.**, Worth A., et al. (2021). *Integration of data across toxicity endpoints for improved safety assessment of chemicals*. *Archives of Toxicology*, 95, 1971–1993.
5. Colacci A., et al. (2020). *Environmental pollution and COVID-19: the molecular terms and predominant disease outcomes of their sweetheart agreement*. *Epidemiologia e Prevenzione*.
6. Mescoli A., et al. (2020). *The Secretive Liaison of Particulate Matter and SARS-CoV-2*. *Frontiers in Genetics*, 11:579964.

### Other Scientific Contributions

- **Pillo G.** (2024). Research project presentation, LEARN&SHARE 2024 – DIMEC Doctoral Meeting (18–20 September 2024).
- **Pillo G.** (2023). Poster presentation of PhD research project, LEARN&SHARE 2023 – DIMEC Doctoral Meeting (25–26 September 2023).
- **Pillo G.**, Mascolo M.G., Maffei G., et al. (2021). *Exploring the correlation between COVID-19 and pollution*. Abstract presented at ISEE Young 2021 Virtual Conference (18–19 February).
- Baldini M., Bartolacci S., Bortone G., et al. (including **Pillo G.**) (2020). *Valutazione del possibile rapporto tra l'inquinamento atmosferico e la diffusione del SARS-CoV-2*. *Epidemiologia e Prevenzione*, COVID-19 Repository, Preprint.
- **Pillo G.** (2019). *Comparative evaluation of systemic endpoints: the case of carcinogenicity*. Poster 086, JRC Summer School on Non-Animal Approaches in Science, European Commission – Joint Research Centre, Ispra, Italy.
- Maffei G., Mescoli A., **Pillo G.** (2019). *Molecular markers for the study of atmospheric pollutant effects*. In: SNPA (2020), *Focus XV Report on Urban Environmental Quality 2019*, p. 259.