

BIOGRAPHICAL SKETCH

NAME: Silvia Laura Toffolatti

POSITION TITLE: Associate Professor of Plant Pathology, Department of Agricultural and Environmental Sciences, Università degli Studi di Milano

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Università degli Studi di Milano	M.Sc.	07/2002	Biological Sciences
Università degli Studi di Milano	Ph.D.	01/2007	Agricultural Ecology

A. Personal Statement

I am an Associate Professor at the Department of Agricultural and Environmental Sciences, University of Milan, with extensive experience in plant pathology, focusing on sustainable management of fungal diseases in grapevine. My research integrates biological, epidemiological and biotechnological approaches, resistance monitoring, and digital technologies to develop sustainable disease control strategies. I have coordinated several nationally competitive projects and served as a work package leader in an international project working on grapevine disease management and fungicide resistance, contributing to both fundamental and applied plant pathology. My expertise supports the development of innovative methods for disease control and resistance monitoring, to reduce the impact of fungicide application and increase sustainability in viticulture.

Ongoing and recently completed projects (competitive calls) that I would like to highlight include:

Project title	Funder	Project start and end date	Financing	Role
Smart Biotechnology for Sustainable Berry Cultivation (SMARTBERRY)	Ministry of University and Research (PRIN call 2022)	12/10/2023 - 11/10/2025	250.235 €	Lead of the research unit at the University of Milan
Grape for vine: recycling grape wastes to protect grapevine from fungal pathogens (Grape4vine)	Cariplo Foundation	01/04/2023-31/03/2026	300.000 €	Project Coordinator
Vino-CONNECT: an initiative to monitor vine diseases in Lombardy APP-involving the world of viticulture	Lombardy Region (RL_DG-AGR - Bandi DG Agricoltura)	29/09/2022 - 28/09/2024	192.883,46 €	Scientific Coordinator
Novel Pesticides for a Sustainable Agriculture (NoPest)	European Union H2020-FETOPEN	1/1/2019-31/12/2024	3.200.000 €	Working Package Leader (WP6)

B. Positions, Scientific Appointments, and Honors

Positions:

- 2021–Present: Associate Professor, University of Milan, Italy
- 2018–2021: Researcher (RTDB), University of Milan
- 2016–2018: Researcher (RTDA), University of Milan
- 2011–2016: Research Fellow (Type B), University of Milan
- 2007–2011: Research Fellow (Type A), University of Milan

Honors and Professional Service:

- National Scientific Qualification (Full Professor, 2016–2034), Sector Plant Pathology
- Executive Editor (since 2025), Associate Editor (2022–2025), Pest Management Science
- Associate Editor, Frontiers in Plant Science (Plant Pathogen Interactions section, since 2022)
- Secretary (since 2023) and Board Member (since 2020), Italian Association for Plant Protection (AIPP)

C. Contributions to Science

My main research activity focuses on finding sustainable solutions for the protection of grapevine from downy mildew, caused by the oomycete *Plasmopara viticola*. Here are listed my main research activities.

1. Grapevine resistance to downy mildew

I contributed to the identification of genetic loci associated with resistance and susceptibility to downy mildew in *Vitis vinifera*. This work advances knowledge on host-pathogen interactions and supports breeding for durable resistance and the identification of antifungal compounds (VOCs).

Selected publications:

- a. Ricciardi V, Minio A, Massonnet M, Wittenberg AHJ, Figueroa-Balderas R, Maghradze D, **Toffolatti SL**, Failla O, Cantu D, De Lorenzis G (2025). The genome of *Vitis vinifera* cv. Mgaloblishvili reveals resistance and susceptibility factors to downy mildew in the Rpv29 and Rpv31 loci. *Hortic Res.* 20;12(6):uhaf055.
- b. Ricciardi V., Marcianò D., Sargolzaei M., Maddalena G., Maghradze D., Tirelli A., Casati P., Bianco P.A., Failla O., Fracassetti D., **Toffolatti S.L.***, De Lorenzis G.* (2021). From plant resistance response to the discovery of antimicrobial compounds: The role of volatile organic compounds (VOCs) in grapevine downy mildew infection. *Plant Physiology and Biochemistry*, 160: 294–305.
- c. **Toffolatti S.L.***, De Lorenzis G.*, Costa A., Maddalena G., Passera A., Bonza M.C., Pindo M., Stefani E., Cestaro A., Casati P., Failla O., Bianco P.A., Maghradze D., Quaglino F. (2018). Unique resistance traits against downy mildew from the center of origin of grapevine (*Vitis vinifera*). *Scientific Reports*, 8:12523.

2. Fungicide resistance

I have led studies monitoring resistance in *Plasmopara viticola* populations to key fungicide classes including QoIs, CAAs, OSBPIs, providing important data (mechanisms of resistance, evolution and effects of selection pressure) for resistance management in viticulture.

Selected publications:

- a. Peracchi, M., Maddalena, G., Lecchi, B., Massi, F. and **Toffolatti, S.L.** (2025), The role of selection pressure in shaping zoxamide resistance in *Plasmopara viticola* populations. *Pest Manag Sci.* <https://doi.org/10.1002/ps.8890>
- b. **Toffolatti, S. L.**, Lecchi, B., Maddalena, G. G., Marcianò, D., Stuknytė, M., Arioli, S., Mora, D., Bianco, P.A., Borsa, P., Coatti, M., Waldner Zulauf, M., Borghi, L., & Torriani, S. F. F. (2024). The management of grapevine downy mildew: from anti resistance strategies to innovative approaches for fungicide resistance monitoring. *Journal of Plant Diseases and Protection*, 131: 1225-1232.
- c. Massi, F., Torriani, S. F. F., Waldner Zulauf M., Bianco, P. A., Coatti, M., Borsa, P., Borghi, L., & **Toffolatti, S. L.** (2023). Characterization of Italian *Plasmopara viticola* populations for resistance to oxathiapiprolin. *Pest Management Science*, 79(3), 1243-1250.

- d. **Toffolatti S.L.***, Russo G., Campia P., Bianco P.A., Borsa P., Coatti C., Torriani S.F.F., Sierotzki H. (2018). A time course investigation of resistance to the carboxylic acid amide mandipropamid in field populations of *Plasmopara viticola* treated with anti resistance strategies. *Pest Management Science*, 74: 2822-2834
- e. **Toffolatti S.L.***, Prandato M., Serrati L., Sierotzki H., Gisi U., Vercesi A. (2011). Evolution of Qol resistance in *Plasmopara viticola* oospores. *European Journal of Plant Pathology*, 129: 331-338.

3. **Biotechnological fungicides**

My research includes the screening for efficacy of innovative fungicides, such as peptide aptamers and RNAi-based approaches targeting susceptibility genes in grapevine, as novel, target-specific tools to control grapevine downy mildew, combining molecular biology and plant pathology.

Selected publications:

- a. Marciànò D., Ricciardi V., Marone Fassolo E., Passera A., Bianco P.A., Failla O., Casati P., Maddalena G., De Lorenzis G.*, **Toffolatti S.L.*** (2021). RNAi of a Putative Grapevine Susceptibility Gene as a Possible Downy Mildew Control Strategy. *Frontiers in Plant Science*, 12: 667319.
- b. Colombo, M., Masiero, S., Rosa, S., Caporali, E., Toffolatti, S. L., Mizzotti, C., Tadini, L., Rossi, F., Pellegrino, S., Musetti, R., Velasco, R., Perazzolli, M., Vezzulli, S., & Pesaresi, P. (2020). NoPv1: a synthetic antimicrobial peptide aptamer targeting the causal agents of grapevine downy mildew and potato late blight. *Scientific Reports*, 10, 17574.

Patent:

- a. ANTIMICROBIAL PEPTIDES FOR THE CONTAINMENT OF OOMYCETES IN AGRICULTURE / P. Pesaresi, S. Masiero, S. Rosa, C. Mizzotti, A. Tagliani, S. Pellegrino, L. Feni, **S.L. Toffolatti**, D. Marciànò, V. Bulone, V. Srivastava, S. Ongerì, L. Radal. (2025). Patent publication number: WO2025093718.
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2025093718>

4. **Biology and epidemiology of *Plasmopara viticola***

My research in this area focuses on the biology, population genetics, and infection dynamics of *Plasmopara viticola*, the causal agent of grapevine downy mildew. I have investigated key aspects such as oospore germination, the characteristics of the secondary inoculum, and the genetic structure and mating system of pathogen populations. Through this work, I aim to deepen the understanding of the pathogen's epidemiology and support the development of sustainable disease management strategies.

Selected publications:

- a. Massi, F., Marciànò, D., Russo, G., Stuknytė, M., Arioli, S., Mora, D., & **Toffolatti, S. L.** (2022). Evaluation of the characteristics and infectivity of the secondary inoculum produced by *Plasmopara viticola* on grapevine leaves by means of flow cytometry and cell sorting. *Applied and Environmental Microbiology*, 88, e0101022.
- b. Maddalena G., Russo G., **Toffolatti S.L.*** (2021). The Study of the Germination Dynamics of *Plasmopara viticola* Oospores Highlights the Presence of Phenotypic Synchrony With the Host *Frontiers in Microbiology*, 12: 698586.
- c. Dussert Y., Legrand L., Mazet I., Couture C., Piron M. C., Serre R. F., Bouchez O., Mestre P., **Toffolatti S. L.**, Giraud T., Delmotte F. (2020). Identification of the first oomycete mating type locus sequence in the grapevine downy mildew pathogen, *Plasmopara viticola*. *Current Biology*, 30, 3897-3907.
- d. Maddalena G., Delmotte F., Bianco P. A., De Lorenzis G., **Toffolatti S. L.*** (2020). Genetic structure of Italian population of the grapevine downy mildew agent, *Plasmopara viticola*. *Annals of Applied Biology*, 176: 257-267.

Complete cv with List of Published Work

<https://expertise.unimi.it/individual?uri=http://irises.unimi.it/resource/person/15995>