

PERSONAL INFORMATION **Marco Terreni**

📍 Drug Sciences Department  
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## WORK EXPERIENCE

Replace with dates (from - to)

**Since 1997-** employed at the **University of Pavia, Italy**,  
**since 01-01-2011 Full Professor in Medicinal Chemistry** School of Pharmacy

**1990-1992. Politecnico di Milano** (Italy). Department of organic chemistry, (Prof. C. Fuganti): *chemical and enzymatic synthesis of  $\beta$ -lactamic antibiotics*.

**1992-1993. Research institute of pharmacology "Mario Negri"**, Milano (Italy), Laboratory directed by Dr. R. Fanelli: *Development of methods in GC-MS and HPLC-MS for the Analysis pesticides in environmental samples*

**1993-1996 University of Pavia.** Pharmaceutical chemistry department. pHD student (Prof. G. Pagani): *Enzymatic synthesis of  $\beta$ -lactamic antibiotics*

**Since 1997- University of Pavia, Italy.** Drug Sciences Department; school of Pharmacy.

**Other research activities**

**1994-1996: Frequency as invited scientist. C.S.I.C., Madrid (Spain).** Institute of "Biocatalisi y Petrolquímica", (Dr. J. M. Guisan): *Development of immobilized biocatalyst and bioprocesses*

**2017-2019 Frequency as Invited scientist at Sorbonne University**, "Institut Parisien de Chimie Moléculaire" (IPCMI); research group GOBS (Yongmin Zhang and Matthieu Sollogoub)

**Other activities**

**Council of Europe, Strasburg.**

- 2000-2017 Italian delegate at the European Pharmacopea for the "Certification of Suitability"
- 2001-2007 member of the Technical Advisor Board (TAB) for the "Certification of Suitability" at the European Pharmacopea.

**June 2011- December 2015** president of the consortium Italian Biocatalysis Center (public private research consortium)

**From 2016** invited professor responsible of the course in **Advanced Biology**" (since 2022 "**Biomolecules**" (3CTS); Faculty of Pharmacy University Paris Descart/Paris Cité (Paris; French), Joint International Master in NANOED (Erasmus Mundus).

**2023-2024** grant as invited professor by the Italian-French University organisation. Research and teaching activity on nano-biotechnology and Nanomedicine

## EDUCATION AND TRAINING

1990 Degree in "pharmaceutical chemistry and technology" University of Pavia, Italy.

1992 Diploma Two years Specialization school in "Chemical Synthesis", Politecnico of Milano, Italy.

- 1997 Ph.D. in "Pharmaceutical Chemistry and technology", University of Pavia, Italy.

## WORK ACTIVITIES

**Grants** Prof. Marco Terreni has been coordinator in **6 projects financed by public national organisations and 12 Project financed by pharmaceutical companies**

Relevant projects:

1) Principal investigator and coordinator of the research unit (university of Pavia): **VATUB- Biotechnological approach for the rational design of a new anti-TB vaccine**. Financed by *Regione Lombardia* (Regional government of Lombardia); *Duration* 24 months; *Start*: 1 December 2010  
*Partnership*: Università di Pavia, Università di Milano, *Università dell'Insubria* (Varese)  
*Co-partners*: *University Hospital Policlinico San Matteo* (Department of infectious diseases)  
 Financial support received for the project **446.700 Euro**

2) Responsible of the research unit for the CLUSTER "Italian Biocatalysts Centre" (University of Pavia and University of Milan) in the project: **"Da antiche colture materiali e prodotti per il futuro" (VeLiCa)**; and aiming the **regeneration of agricultural wastes for production of high value products**. Financed by *Regione Lombardia* (Regional government of Lombardia); *Duration*: 30 months; *Start*: February 2011.

in partnership with:

**Italian Biocatalysis Center (Consortium IBC):**  
**University of Pavia (Drug Science Department)**  
**University of Milan (Department of industrial organic chemistry)**  
**CNR of Milan:**

BBA (Istituto di Biologia e Biotecnologia Agraria)  
 ISMAC (Istituto per lo Studio delle Macromolecole)  
 ISTM (Istituto di Scienze e Tecnologie Molecolari)  
 ICRM (Istituto di Chimica del Riconoscimento Molecolare).

Financial support received for the consortium **IBC 400.000 Euro**

3) Since 2023 Principal Investigator and coordinator of the research unit (University of Pavia) for the project financed by the Italian Ministry of health (call for the POS -Piano Operativo Salute- objective 4 **"Biotechnology, bioinformatic and pharmaceutical development"**): **"ImmunoHUB- Immunoterapia: cura e prevenzione di malattie infettive e tumorali"** (Immunotherapies: Care and prevention of infective and cancer diseases)

Co-Partners:

University of Rome Tor Vergata (Roma)  
 University of Insubria (Varese)  
 Scuola Normale di Pisa (Pisa)  
 Hospital "Fatebenefratelli-Sacco" (Milan)  
 University Hospital of Pavia (Pavia)  
 National Institute of Cancer (Milan)

Total financial support received for the project **7.869.000 Euro**

Financial support received for the University of Pavia **2.900.000 Euro**

PERSONAL SKILLS

Mother tongue(s) Italian  
 Other language(s) English (good); French (Very good), Spanish (Very good)

ADDITIONAL INFORMATION

Statement of Research Interests

The research activity is mainly focused in biocatalysis (development of new bio-catalysts and green bio-processes) for the synthesis of biological relevant molecule and in medicinal chemistry for the design and development of biomolecules (oligosaccharides, glycolipids, glycoconjugate products and new protein based drugs and therapeutic products).

Main topics:

1) *Medicinal Chemistry and biotechnology*.

Chemo-enzymatic synthesis glycolipids of biological interest as anticancer drugs.

Chemo-enzymatic synthesis of antigeni-immunogenic oligosaccharides and glycoconjugates.

Study of semi-synthetic glycoproteins and new glycoconjugate products as potential vaccines. Design and development of vaccines against tuberculosis

2) *Application in Nano-biotechnology and Nanomedicine*.

Study of glycosylated nano-vaccines

Investigation of bio-material for immobilization of grow factor (for regenerative therapies)

3) *Biocatalysis in organic synthesis and development of new green bio-processes:*

Preparation of efficient biocatalyst by immobilization of enzymes

Enzymatic and chemo-enzymatic synthesis on nucleosides and nucleotides with antitumoral or antiviral activity

## Publications

total number of publications in peer-review journals: **129**total number of citations: **2792** (Scopus December 2022)H index (Scopus): **30** (Scopus December 2022)

1) Marco Filice, Jose M. Guisan, Marco Terreni and Jose M. Palomo; Regioselective monodeprotection of peracetylated carbohydrates **Nature protocols** 10; 1783-1796 (2012). <https://doi.org/10.1038/nprot.2012.098>

2) Temporini C., Bavaro T., Tengattini S., Serra I., Marrubini G., Calleri E., Fasanella F., Piubelli L., Marinelli F., Pollegioni L., Speranza G., Massolini G., Terreni M., "Liquid chromatography–mass spectrometry structural characterization of neo glycoproteins aiding the rational design and synthesis of a novel glyco-vaccine for protection against tuberculosis". **J. Chromatogr. A**, 1367:57-67 (2014). <http://dx.doi.org/10.1016/j.chroma.2014.09.041>

3) Teodora Bavaro, Marco Filice, Caterina Temporini, Sara Tengattini, Immacolata Serra, Carlo F. Morelli, Gabriella Massolini, Marco Terreni "Chemoenzymatic synthesis of Neoglycoproteins Driven by the Assessment of Protein Surface Reactivity" **RSC advances**, 4 (99), 56455–56465 (2014). <https://doi.org/10.1039/C4RA11131A>

4) Bavaro T., Tengattini S., Piubelli L., Mangione F., Bernardini R., Monzillo V., Calarota S., Marone P., Amicosante M., Pollegioni L., Temporini C., Terreni M. Glycosylation of Recombinant Antigenic Proteins from *Mycobacterium tuberculosis*: In Silico Prediction of Protein Epitopes and Ex Vivo Biological Evaluation of New Semi-Synthetic Glycoconjugates. **Molecules**. 22(7): 1081-1097, (2017). <https://doi.org/10.3390/molecules22071081>

5) Francesca Rinaldi, Sara Tengattini, Luciano Piubelli, Roberta Bernardini, Francesca Mangione, Teodora Bavaro, Gregorino Paone, Maurizio Mattei, Loredano Pollegioni, Gaetano Filice, Caterina Temporini, and Marco Terreni; "Rational design, preparation and characterization of recombinant Ag85B variants and their glycoconjugates with T-cell antigenic activity against *Mycobacterium tuberculosis*" **RSC advances** 8(41), 23171-23180 (2018). <https://doi.org/10.1039/C8RA03535K>

6) Changping Zheng, Huimin Guan, Zhihao Li, Teodora Bavaro, Marco Terreni, Matthieu Sollogoub and Yongmin Zhang. "Chemoenzymatically synthesized ganglioside GM3 analogues with inhibitory effects on tumor cell growth and migration" **European Journal of Medicinal Chemistry** 165, 107-114 (2019) <https://doi.org/10.1016/j.ejmech.2019.01.016>

7) C. Zheng, R. Huang, T. Bavaro, M. Terreni, M. Sollogoub, J. Xu, Y. Zhang "Design, synthesis and biological evaluation of new ganglioside GM3 analogues as potential agents for cancer therapy" **European Journal of Medicinal Chemistry** 189, 112065 (2020) <https://doi.org/10.1016/j.ejmech.2020.112065>

8) P. Hoos,; T. Bavaro,; A. Perona,; A. Rumbero,; S. Tengattini,; M. Terreni, M.J. Hernaiz, "Highly efficient and sustainable synthesis of neoglycoproteins using galactosidases" **ACS Sustainable Chem. Eng.** 8, 6282–6292 (2020) <https://doi.org/10.1021/acssuschemeng.9b07785>

9) Li Z., Bavaro T., Tengattini S., Bernardini R., Mattei M., Annunziata F., Cole R. B., Zheng C., Sollogoub M., Tamborini L., Terreni M., Zhang Y. Chemoenzymatic synthesis of arabinomannan (AM) glycoconjugates as potential vaccines for tuberculosis. **European Journal of Medicinal Chemistry**, vol. 204, 112578 (2020) <https://doi.org/10.1016/j.ejmech.2020.112578>

10) Hoyos, P., Perona, A., Bavaro, T., F. Marinelli, Terreni, M., Hernáiz, M.J., Biocatalyzed Synthesis of Glycostructures with Anti-infective Activity. **Accounts on Chem. Res.** 55(17), pp. 2409–2424 (2022) <https://doi.org/10.1021/acs.accounts.2c00136>