1st Training School of Sigma-1 Europe

Modern drug discovery approaches in the field of sigma-1 receptor modulators

Department of Drug Sciences and Department of Biology and Biotechnology University of Pavia, Pavia, Italy

30th March – 2nd April 2026

Scientific Committee
Carmen Abate, Simona Collina, Tangui Maurice, Marco Peviani, Daniela Rossi.

Local organizing Committee
Daniela Buonocore, Paolo Cabras, Valeria Cavalloro, Anna Fontana, Alice Fossati, Martina Garbagnoli, Andrea Gazzano, Roberta Listro, Pasquale Linciano, Emanuela Martino, Marco Peviani, Daniela Rossi, Giacomo Rossino, Mauro Giuseppe Spatafora, Caterina Valentino, Barbara Vigani.

Trainers
Carmen Abate, Emanuele Amata, Daniela Buonocore, Paolo Cabras, Valeria Cavalloro, Marialessandra Contino, Michael Decker, Anna Fontana, Alice Fossati, Martina Garbagnoli, Andrea Gazzano, Pasquale Linciano, Veronica Morea, Maria Grazia Perrone, Marco Peviani, Giacomo Rossino, Daniela Rossi, Mauro Giuseppe Spatafora.

Program

Day 1. March 30th, 2026
Polo Didattico, Department of Drug Sciences

12.00 - 14.00	*Registration*
14.00 - 14.30	Opening of the 1st training school “Modern drug discovery approaches in the field of sigma-1 receptor modulators” with greetings from local and international authorities. Prof. Simona Collina, Head of the Dep. of Drug Sciences, University of Pavia, Italy. Prof. Matteo Alvaro, Pro-Rector for International Affairs, University of Pavia, Italy. Prof. Tangui Maurice, Chair of the COST action SIGMA-1EUROPE, University of Montpellier, France.
14.30 - 15.15	The sigma-1 receptor and its modulators: valuable therapeutic and diagnostic opportunities. Prof. Carmen Abate, Prof. Tangui Maurice, Prof. Marco Peviani and Prof. Daniela Rossi.

15.15 - 16.00	Which story do I want to tell? How to plan my project to lead to its publication(s)? Prof. Michael Decker, University of Würzburg, Germany.
16.00 - 16.30	*Coffee break*
16.30 - 18.00	Bridging the gap in science: fostering international connections. Dr. Elisa Tamburnotti, University of Pavia, Italy.
18.00 - 19.00	*Refreshment*

Day 2. March 31st, 2026
Polo Didattico, Department of Drug Sciences

Modern drug discovery approaches - part 1: from drug design to targeting the CNS

9.00 - 9.15	Introduction to the session. Prof. Daniela Rossi, Dep. of Drug Sciences, University of Pavia, Italy.
9.15 - 10.00	In silico design of sigma-1 receptor ligands. Prof. Julio Caballero, University of Talca, Chile.
10.00 - 10.30	Green chemistry approaches for the preparation of sigma-1 receptor modulators. Prof. Giacomo Rossino, Dep. of Drug Sciences, University of Pavia, Italy.
10.30 - 11.00	*Coffee break*
11.00 - 11.30	Developability assessment at early-stage discovery: how to reach the CNS? Dr. Giulio Massimo Dondio, Aphad s.r.l, Buccinasco (MI), Italy.
11.30 - 12.00	In silico prediction of developability of sigma1-receptor modulators. Prof. Pasquale Linciano, Dep. of Drug Sciences, University of Pavia, Italy.
12.00 - 12.30	Drug delivery systems for targeting the CNS. Prof. Barbara Vigani, Dep. of Drug Sciences, University of Pavia, Italy.
12.30 - 13.30	*Refreshment*

Peptides as pharmacological tools or therapeutic agents: challenges and opportunities in the sigma-1 receptor field

13.30 - 13.45	Introduction to the session. Prof. Daniela Rossi,Dep. of Drug Sciences, University of Pavia, Italy.
13. 45 - 14.30	Structure-based design of peptides as Sigma1-Receptor-BIP PPI inhibitors. Dr. Veronica Morea, CNRCNR-IBPM, Roma, Italy.

14:30 - 15.00	Microwave-assisted solid phase peptide synthesis: towards an increasingly green approach. Dr. Giorgio Marini - European Life Science Technical Specialist, CEM, Bergamo, Italy.
15.00 - 18.00	**HANDS-ON training session.** **Microwave-assisted solid phase peptide synthesis and In silico approaches' application.** Pharmaceutical synthesis Lab- Polo Didattico Dep. of Drug Sciences, University of Pavia. Trainees will be divided into different groups and will attend parallel sessions: 1) Microwave-assisted solid phase peptide synthesis; 2) In silico studies.

Day 3. April 1st, 2026
Benzi Room, Department of Biology and Biotechnology

Modern drug discovery approaches - part 2: in vitro assays for sigma-1 receptor ligands profiling

9.00 - 9.30	Introduction to the session. Prof. Carmen Abate, Dep. of Pharmacy-Pharmaceutical Sciences, University of Bari, Italy *and* Prof. Marco Peviani, Dep. of Biology and Biotechnology, University of Pavia, Italy.
9.30 - 10.30	Designing in vitro assays to assess the pharmacodynamic profile of novel ligands with traditional and innovative methodologies (part 1: *focus on competition binding assays*). Prof. Emanuele Amata, Dep. of Drug and Health Sciences, University of Catania, Italy *and* Prof. Marialessandra Contino, Dep. of Pharmacy-Pharmaceutical Sciences, University of Bari, Italy.
10.30 - 11.00	*Coffee Break*
11.00 - 12.00	Designing in vitro assays to assess the pharmacodynamic profile of novel ligands with traditional and innovative methodologies (part 2: *focus on functional activity and target engagement).* Prof. Maria Grazia Perrone, Dep. of Pharmacy-Pharmaceutical Sciences, University of Bari, Italy *and* Prof. Marco Peviani, Dep. of Biology and Biotechnology, University of Pavia, Italy.
12.00 - 13.00	*Refreshment*
13.00 - 18.00	**HANDS-ON training session.** **Assessing fluorescent ligands internalization through spectrofluorimetry and flow cytometry.**

	Trainees will receive theoretical briefing to recall the properties of fluorescent dyes, strategies to achieve gene silencing and overexpression to generate the proper cell models to assess target engagement. Trainees will be divided into 5 groups and will attend different sessions on Day 3 and Day 4 to perform the following activities: 1) meet with tech specialists to be introduced to the instruments' functionalities; 2) cell culture handling (addition of ligands to cells and incubation); 3) read-out at the spectrofluorimeter and flow cytometer; 4) familiarize with FACS analysis software, analyze the results and elaborate a report.

Day 4. April 2nd, 2026
Benzi Room, Department of Biology and Biotechnology

Modern drug discovery approaches - part 2: in vitro assays for sigma-1 receptor ligands profiling

9.00 - 13.00	**HANDS-ON training session.** **Assessing fluorescent ligands internalization through spectrofluorimetry and flow cytometry.** The 5 groups of trainees will complete the activities started on Day 3.
13.00 - 14.00	*Refreshment*

Modern approaches to drug discovery - part 3: from bench to in vivo proof of concept

14.00 - 14.30	Toward the Identification of Neuroprotective Agents: the story of RC-33. Prof. Daniela Rossi and Prof. Marco Peviani, University of Pavia, Italy.
14.30 - 15.00	Discovery of SIT3060, a novel drug candidate acting as a selective s1 receptor agonist, with cytoprotective and therapeutic efficacy in Wolfram syndrome. Prof. David Virieux, ICGM, ENSCM, University of Montpellier, France.
15.00 - 15.45	Beyond the School: Growing Connections for Long-term collaborations. Dr. Elisa Tamburnotti. University of Pavia, Italy.
15.45 - 16.00	*Closing remarks*