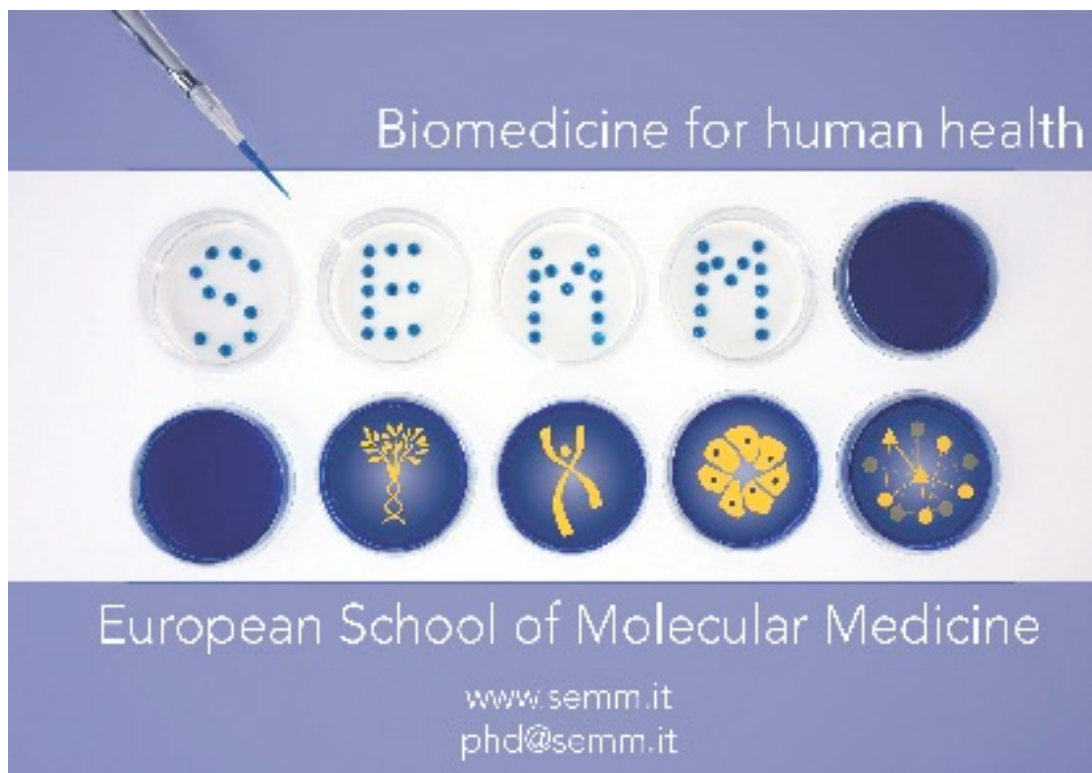


Ph.D. Program in  
Systems Medicine

# Students Handbook



Biomedicine for human health

European School of Molecular Medicine

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The banner features a central row of ten petri dishes. The first four contain blue dots arranged in the letters 'S', 'E', 'M', and 'M'. The fifth is empty. Below this row are five circular icons: a blue circle, a yellow caduceus, a yellow DNA double helix, a yellow flower-like structure, and a yellow network diagram. A pipette is shown in the top left corner.



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## PhD PROGRAM IN SYSTEM MEDICINE

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The PhD Program aims to train young and motivated researchers in the wide field of modern Biomedicine. The general idea is that complex systems, such as diseases and their pathogenesis, cannot be understood if taking into account a single point of view. The expertise of different scientists, biologists, medical doctors, computer scientists, physicists and mathematicians must give their contribution to provide new insights.

The PhD program in Systems Medicine includes the following curricula:

MOLECULAR ONCOLOGY  
COMPUTATIONAL BIOLOGY  
HUMAN GENETICS  
MEDICAL HUMANITIES

SEMM PhD program is a 3rd-cycle university degree, fully academic in nature and it is released by SEMM's collaborating universities that acts as awarding bodies: University of Milan and University of Naples Federico II.

In the final title and the certificate, the corporate/scientific role of SEMM Foundation is formally mentioned. The title gives full access to post-doctoral research positions in Europe and worldwide.

The PhD Program lasts 4 years and English is the working language.

All admitted students will have a fellowship. Fellowships are mostly offered by the Universities. The number of available positions/fellowships will be communicated at the time of the call. More info on the University fellowships can be found at the University website.

Some additional fellowships may be available at host research centers. These fellowships will be independently managed by the individual granting institutions with specific awarding and delivery modalities; these will not be in any way ascribable either to SEMM or the University.

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## SUPERVISION

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Each PhD student is supervised by a team of three tutors with different profiles: the supervisor, the internal advisor and the external advisor.

### ◆ Supervisor

The Supervisor is the head of the scientific laboratory in which the student works. The supervisor offers guidance with respect to the:

- ✓ definition of important scientific issues;
- ✓ research and experimental plan;
- ✓ exploitation of technological and experimental resources;
- ✓ preparation of documentation and the communication of the project results;
- ✓ research development plan;
- ✓ writing of scientific articles.

The Supervisor is responsible for the student's activity in the laboratory and will constantly review it during the four years of the PhD course. At least one monthly meeting with the supervisor is recommended.

The supervisor can appoint a senior scientist of the group as **added supervisor**, who will follow the student's experimental work. The added supervisor must be present during any official discussion (e.g. mid-term seminar, thesis seminar etc.) of the student's activity.

### ◆ Internal Advisor

The Internal Advisor must be chosen, in agreement with the Supervisor, among the group leaders of the school sites. He/she should become a reference point for the student, contributing to his/her training and choices.

#### **Duties of the internal advisor**

- ✓ To serve as a mentor for the student
- ✓ To regularly meet the student to discuss the progress of the experimental work as well as any problem that may arise during the PhD.
- ✓ To evaluate student's performance

### ◆ External Advisor

The External Advisor should be a principal investigator in a foreign scientific institution (preferentially in Europe) and an expert in the student's field of study. He/she is chosen by the jointly by the student and the supervisor, based on the recognized scientific experience, scientific affinity with the project and availability. Italian and overseas external advisors can be accepted only if supported by a strong motivation.

#### **Duties of the external advisor**

- ✓ To meet the student at least once to discuss the progress of the experimental work
- ✓ To evaluate student's performance

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## STUDENT DUTIES AND EVALUATIONS

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### ◆ 1<sup>st</sup> Year

#### **Probationary period**

The 1<sup>st</sup> year is part of a probationary period, lasting one year and a half. At the end of this period, supervisor and advisors will be asked to evaluate students' attitude to research, motivation and determination to succeed in a demanding program.

### ◆ 2<sup>nd</sup> Year

#### **Meeting with the advisors**

Within the probationary period the students should meet the internal and the external advisors.

#### **Probationary Period Report**

During the last week of March, students are requested to deliver the probationary period report. The report will include scientific and personal sections. The scientific section should not exceed three pages and must include:

- ✓ An outline of the project
- ✓ A summary of preliminary results
- ✓ Perspectives

#### **Outcome of the probationary period**

After collecting feedbacks from the supervising team, each student will be ranked as follows:

- ✓ Approved. When all members of the supervising team agree that the student should continue the program.
- ✓ Approved with reserve. When there are divergent opinions and the student's situation is not clear. He/she will be asked to discuss the project and personal matters with an *ad hoc* committee that will take the final decision. The committee is chosen by the site coordinator.
- ✓ Not approved. When all members of the supervising team agree that the student should not continue the program. In this case, the student will be asked to leave the PhD program.

### ◆ 3<sup>rd</sup> Year

#### **Public seminar**

Between February and May of the 3<sup>rd</sup> year, each student must hold a public seminar to present the data obtained and the future experimental plan that will lead to completion of the project in time for thesis discussion. The supervisor, the internal advisor, and two other members of the SEMM Faculty will evaluate the quality of the seminar. In case of a negative judgement on the seminar and/or the proposed future plans, the student will have to hold a second seminar within three months and present a modified work program according to the recommended guidelines.

#### **Paper-like Report**

By the end of September, a paper-like report, structured as a scientific paper, must be delivered to the SEMM office. The discussion section should include a detailed description of the experiments that will be performed in order to complete the thesis.

The report must be approved by the whole supervising team, who must also indicate if the future plans proposed will allow the student to complete the thesis in due time.

### ◆ 4<sup>th</sup> year

During the last year of enrolment, the student will write the thesis and prepare for its discussion. Details on how to write the thesis, deadlines and examination procedures are reported in the appropriate sections.

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## REQUIREMENTS AND PROCEDURE FOR GRADUATION

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The procedure for Graduation includes two steps, the SEMM examination and the Graduation Day.

To go through the Graduation Day, students must first pass the SEMM examination.

### ◆ Examiners

For the SEMM examination, each student will be examined by a panel composed of an internal and an external examiner.

The internal examiner should:

- Be a SEMM faculty member different from the internal advisor
- Not necessarily be an expert in the field
- Not have any direct collaboration with the student

The external examiner should:

- Work in a foreign scientific institution (preferably a European institution hosting a PhD program). The choice of Overseas or Italian examiners is discouraged, unless exceptional motivations are presented.
- Be an expert in the field
- Not have any co-authorships with the student's group in the last 5 years

### ◆ Submission of the thesis to the SEMM office

The thesis must be submitted **no later than September 30<sup>th</sup>**, which is the official date for the end of the PhD program.

### ◆ Thesis evaluation

The external examiner and the external advisor will be asked to provide a written evaluation of the thesis. The comments of the external advisor will be considered by the examiners during the VIVA.

### ◆ Thesis Viva

The Viva consists of two parts:

#### Public seminar

Students must present their data in a 40-minute public seminar. Questions from the audience are allowed.

#### Oral examination

During the oral examination, the examiners must ascertain that the thesis is the student's own original work and that it meets the criteria for awarding the PhD degree.

### ◆ Graduation Day & Award of the degree

An Assessment Board appointed by the University of Milan will evaluate the thesis, taking into account the recommendations given by the examiners, and finally award the PhD degree during Graduation Day.

## TRAINING ACTIVITIES

The SEMM PhD course extends over four years. Students are requested to gain 18 credits, distributed as follows:

- 8 mandatory courses to be taken during the first two years = 12 credits
- Attendance to 20 seminars/year = 2 credits
- 4 Optional courses = 4 credits

The courses list is available at:

<http://www.semm.it/education/current-students/courses>

Courses

### **Mandatory courses**

#### *MOLECULAR ONCOLOGY AND HUMAN GENETICS CURRICULUM*

COURSE	YEAR of attendance	Month of attendance
Scientific Methodologies	1	January
Biochemistry and Molecular Biology Techniques	1	January
Statistics	1	January
Imaging	1	January
Bioinformatics	2	February
Genomics & Proteomics	2	February
Cancer Genetics	2	February
Scientific Writing	2	February



*COMPUTATIONAL BIOLOGY CURRICULUM*

COURSE	YEAR of attendance	Month of attendance
Scientific Methodologies	1	January
Statistics	1	January
Programming	1	January
Bioinformatics	1	February
Network Biology	2	February
Genomics & Proteomics	2	February
Statistics II	2	February
Scientific Writing	2	February

*MEDICAL HUMANITIES CURRICULUM*

COURSE	YEAR of attendance	Month of attendance
Scientific Methodologies	1	January
Principles and practice of structural equation modeling	1 or 2	May vary
Practical course in systematic reviews and meta-analysis	1 or 2	May vary
Qualitative research methodology	1 or 2	May vary
Quantitative research methods and methodology	1 or 2	May vary
Critical thinking	1 or 2	May vary
Communication in medicine	1 or 2	May vary
Scientific Writing	2	February

**Optional courses**

It will be up to the students to define their training path and choose their optional courses.

SEMM offers 2 optional courses per year, other optional courses can be chosen among courses offered by other organizations or graduate schools.

**◆ Additional training activities****Seminars**

SEMM offers a high-tier program of scientific seminars, both from internal and external speakers. Students are requested to attend at least 20 seminars per year (80 in total). Signatures are taken to verify the attendance.

### Students' Data club series

During the second year of enrolment, data clubs are organized on a monthly basis. Two students will present their data to their peers at each meeting. These meetings are intended to be very informal and aim to stimulate scientific discussion. Data club schedule and organization are self-managed by the students.

### Courses from UNIMI

The University of Milan offers a series of 5 mandatory short courses (half day each) on soft skills (Open access, research evaluation, Placement and job market, Grant writing, research integrity).

### Networking activities

SEMM offers to their students the following networking opportunities:

- ENABLE  
The European Academy for Biomedical Science (ENABLE) is a European project managed by a consortium of five partners. ENABLE organizes an annual scientific symposium, coupled with i) a career day; ii) outreach activities for adults, and for primary and secondary school students to foster the interaction between young scientists and the general public. These ENABLE symposia are organized entirely by a committee of PhD students and postdocs of the four involved institutions.
- International PhD students Cancer Conference  
SEMM is part of a network of 8 top cancer research institutes across Europe. An annual cancer conference is organized to provide the opportunity for students to present their work, get in contact with other PhD students working in the same field and interact with international renewed scientists invited as keynote speakers.
- PhD Networking days  
PhD Networking days are internal events organized annually by SEMM PhD students. These events aim to foster an open scientific discussion to renew and enforce motivation to carry on in the scientific world after the PhD. Prominent speakers from and outside the academia will be invited, and all students will have the opportunity to present a poster or give a talk about their PhD project.

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## SEMM GOVERNANCE AND PEOPLE

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### ◆ SEMM at glance

SEMM is a private foundation

SEMM operates within centers of excellence and promotes the integration of basic research and clinical practice

- European Institute of Oncology (IEO), Milan
- FIRC Institute of Molecular Oncology (IFOM), Milan
- Italian Institute of Technology (IIT), Milan
- National Institute of Molecular Genetics (INGM), Milan. **NEW**
- Human Technopole (HT), Milan **NEW**
- Telethon Institute of Genetics and Medicine (TIGEM), Naples
- Genetic Engineering Center (Ceinge-Advanced Biotechnology), Naples



SEMM collaborates with the University of Milan and Naples (awarding bodies) to create and manage its training programs

- University of Milan
- University of Naples Federico II



#### ◆ Governance

The governance of the SEMM PhD program includes:

##### **The President of the SEMM foundation:**

- is the legal representative of SEMM and supervises all SEMM activities.  
*Pier Giuseppe Pelicci*

##### **The Scientific director of SEMM:**

- maintains contacts with all the institutions involved in the School's activities;
- takes care of the executive aspects of the projects;
- delegates to the Educational Committee, the school sites and curricula's Coordinators specific tasks related to the organizational and functional requirements of the training activities.

*Bruno Amati*

##### **The School site coordinator:**

- takes care of defining the general guidelines of the activities of the PhD course, the training programs and objectives of that specific school site (Milan or Naples). The Milan site coordinator is also chairing the Educational committee.

##### **The curricula's scientific coordinators:**

- supervise the students' progress review and are responsible for the specific training activities for the curriculum he/she is coordinating.

##### **The Faculty:**

- is composed of the students' supervisors who are also the PIs of the school sites.

##### **The Educational Activities Committee:**

- includes the curricula coordinators and representatives of the faculty members of all the school sites. The committee is in charge of implementing and managing all the educational activities.

##### **SEMM Graduate Office:**

- manages the selection process from the publication of the call to the enrollment of the admitted candidates;
- manages the entire bureaucratic path from the enrollment to the thesis defense;
- keeps in touch with the Universities where PhD students are officially enrolled;
- coordinates the organization of the training courses and all the other educational activities;
- takes care of students' records;
- assists foreigners for visas.

*People in charge: Francesca Fiore, coordinator, Veronica Viscardi, students' administrator*

