TIGEM’s mission is to understand the mechanisms of genetic diseases and to develop therapeutic and preventive strategies.

| CONTENTS |
|-------------------------|-------|
| Director’s Message       | 5     |
| Dean’s Message           | 7     |
| TIGEM: General Organization | 8     |
| TIGEM Graduate Programmes | 11    |
| General Overview         | 11    |
| Quick Facts              | 12    |
| PhD Programme in Human Genetics | 12    |
| PhD Programme in Molecular Medicine | 13    |
| PhD Programme in Computational Biology and Bioinformatics | 14 |
| PhD Programme in Medical Genetics | 15    |
| Study Plan at a Glance   | 16    |
| Admission Procedure      | 20    |
| Students Duties          | 26    |
| Requirements for TIGEM Graduate Students | 26    |
| The Credit System: How does it Work? | 27    |
| The First Year           | 28    |
| The Following Years      | 32    |
| Curriculum Activities    | 34    |
| Extracurriculum Activities | 38    |
| Fundraising              | 42    |
| Students Thoughts: What do Students think of TIGEM? | 45    |
| Living in Naples         | 50    |
| Glossary of Terms        | 52    |
| Contacts                 | 55    |
Since its foundation in 1994, the Telethon Institute of Genetics and Medicine (TIGEM) has had a forefront role for research and education on genetic diseases. The Institute’s strong collaboration with The Open University, as well as with a number of Italian universities within the Campania region (Università degli Studi di Napoli Federico II, Seconda Università degli Studi di Napoli, Università degli Studi di Salerno), has attracted many university students to TIGEM, from Italy and abroad, for graduate training. Four PhD programmes, at both national and international level, are presently organized at TIGEM, spanning from human and medical genetics to functional genomics and molecular medicine, and computational biology and bioinformatics.

The number and variety of graduate programmes organized and competitive research offered to graduate students make TIGEM an outstanding environment for science graduates wishing to excel in the medical sciences. During the past 15 years, researchers at TIGEM have achieved many important goals in the diagnosis, prevention and cure of human genetic diseases. As an example, TIGEM scientists have contributed to the discovery that the biogenesis and function of lysosomes, which are responsible of the breakdown of cellular waste in animal cells, is regulated by a gene network that responds to a “control room” for lysosomes – the transcription factor TFEB. This discovery lays the foundation for a new therapeutic approach to the illnesses caused by the accumulation of toxic substances in cells, such as Huntington disease, lysosomal storage disorders, Parkinson disease and Alzheimer disease. Another important recent achievement for the Institute has been its first involvement in a clinical trial. In collaboration with the University of Pennsylvania, the Children’s Hospital of Philadelphia and the Department of Ophthalmology of the Seconda Università degli Studi di Napoli, TIGEM has participated with success in a gene therapy trial, significantly improving visual function in 12 patients affected by Leber Congenital Amaurosis (LCA), the most frequent cause of hereditary childhood blindness. These results set the ground knowledge for the treatment of other retinal diseases and pave the way for TIGEM to participate in further gene therapy studies.

Moreover, TIGEM’s annual programme of training courses, seminars, and data clubs allows graduate students to interact with scientists coming from other countries, stimulating the exchange of ideas and improving students’ language and presentation skills and critical point of view, a necessary prerequisite for a future research or teaching career in the medical sciences.

Andrea Ballabio (TIGEM Scientific Director)
TIGEM and its researchers are devoted to the training of scientists in human genetics. The Institute provides a unique environment for students with a deep commitment to their graduate studies. Our graduate programmes are characterized by strong collaborative and interdisciplinary research, in which our scientists, post-docs and trainees work together to solve problems focused on understanding the basic mechanisms of human genetic diseases. Our research now spans the translational research ranging from the most basic to bench-to-bedside research and beyond.

TIGEM graduate programmes are dedicated to:

1. provide outstanding graduate training and education to prepare graduates to be future leaders in research, teaching, human genetics and other biomedical science-based careers;
2. encourage interaction and cooperation among our scientists and trainees;
3. integrate with the scientific community, through research, graduate courses, data clubs and seminars;
4. provide a research environment to foster creative thinking with an emphasis on interdisciplinary training integrating state-of-the-art approaches to basic and clinical sciences, and
5. maintain an informal setting to encourage free thinking.

Over the years our graduate students have pursued successful scientific careers, in Italy, Europe and elsewhere. Have published well, obtained prestigious fellowships and awards, an indicator of the success of our training programmes. We look forward to meeting you here at TIGEM, to experience first hand the adventure of making a scientific discovery.

Graciana Díaz Roux (TIGEM Chief Scientific Officer)
The Telethon Institute of Genetics and Medicine (TIGEM) is an international reference centre for research on genetic diseases. It was created in 1994 by the Telethon Foundation, one of Italy’s major non-profit organizations, to promote the advancement of research aimed at the diagnosis, prevention and cure of human genetic diseases.

TIGEM’s mission is to understand the mechanisms of genetic diseases and to develop therapeutic and preventive strategies. The Institute’s interest spans across three main disease entities: metabolic disorders, with particular focus on lysosomal storage disorders, defects of membrane-trafficking, ciliopathies and retinal degenerations. Research approaches include molecular genetics, cell biology, protein biochemistry, bioinformatics, functional genomics, systems biology and gene therapy (www.tigem.it).

A strategic location
TIGEM is presently located in the upper town quarters of Naples, halfway between the hospital complexes (where also the Medical School of the Università degli Studi di Napoli Federico II is located) and the city centre downtown. The Institute is hosted by the Italian National Research Council (CNR) and is part of a science and technology research complex that is also home to the CNR’s Institutes of Genetics and Biophysics (ICB) and of Protein Biochemistry (IBP).

For a more detailed description see section Living in Naples.

Since its establishment, the Institute has grown considerably. It now consists of a large fully refurbished 2200m² site and comprises 12 independent research groups with over 170 members including graduate students, post-doc fellows, technicians and administration.

A hop away from both the hospital complexes and the academia is also behind TIGEM’s success, by favouring fruitful collaborations and/or training programmes with the Università degli Studi di Napoli Federico II, the Seconda Università degli Studi di Napoli, and the Cardarelli Hospital, among others.

Research at TIGEM
Since its creation the Institute’s research goals have progressively moved from focusing mainly on the identification of genes responsible of genetic diseases to the study of gene function and disease mechanisms. Significant investments have been made in the field of therapeutic applications, in particular through the development of gene delivery/transfer approaches for inherited eye diseases and inborn errors of metabolism and in systems biology and functional genomics with the development of novel approaches to identify regulatory gene networks.

Research at TIGEM currently focuses on the following three strategic programmes:

- **Cell Biology of Genetic Diseases**
- **Systems Biology and Functional Genomics**
- **Molecular Therapy**

TIGEM is investing considerably in Cell Biology to ease and speed the transition from disease gene identification to the study of gene function and disease mechanisms with the aim of generating a reservoir of cell biology expertise-biology expertise, and technological platforms that will synergize with the various already existing projects that involve cell biology approaches.

The Institute plans to continue to diversify its scientific portfolio and to integrate its research with new scientific approaches.

Funding at TIGEM
TIGEM is an intramural research centre of the Telethon Foundation. Telethon’s funding covers structural and research costs and is renewed every five years through a rigorous revision process, comprising the individual evaluation of research projects and a site-visit to the Institute by an international group of scientists. Investigators at the Institute are also funded by prestigious international funding agencies such as the European Union, the National Institute of Health, the European Molecular Biology Foundation (EMBO) and the Wellcome Trust, among others. In the last years TIGEM has played a leading role in EU funded research and has been part of 12 EU funded consortia (EUCILIA, AAW/EYE, CardioGeNet, FLPELEX, EUMODIC, AnEUploidy, CLINIGENE, DiMi, INTERDEVO, EVI-GENORET, RETNET and EUCLYD), three of which have been coordinated and managed by TIGEM.
Students clearly represent a vital resource for science at TIGEM by stimulating the quality of research and by contributing to the formation of an inspiring scientific environment.

Graduate students may join TIGEM by way of four different programmes: two international programmes (The Open University-OU, the European School of Molecular Medicine-SEMM), and two national programmes (the Università degli Studi di Napoli Federico II-UNINA, the Seconda Università degli Studi di Napoli-SUN). The graduate programmes are designed for self-motivated science graduates and medical doctors wishing to become scholars in the medical sciences with the goal to prepare doctoral students for research careers in human genetics (OU), functional genomics and molecular medicine (SEMM), computational biology and bioinformatics (UNINA), or medical genetics (SUN).

The graduate programmes organized by the Institute are based on an official agreement between TIGEM and the universities of enrollment, namely: 1) The British Open University for the PhD programme in human genetics (OU PhD programme), 2) the Università degli Studi di Napoli Federico II for the graduate programmes in molecular medicine and computational biology and bioinformatics (SEMM and UNINA PhD programmes, respectively), and 3) the Seconda Università degli Studi di Napoli for the PhD programme in medical genetics (SUN PhD programme).

For all graduate programmes, TIGEM functions as sponsoring establishment, providing students enrolled in the programme with laboratory space, facilities, resources, and educational activities. The university of enrollment, instead, represents the Research School and awarding body, conferring the student with the final (UK or Italian) PhD title.

There are currently 40 PhD students enrolled at TIGEM, while 68 have successfully completed their graduate studies since the beginning of the programmes.

The establishment of international programmes at TIGEM is of great value because they enhance the dimension of the Institute abroad, with the recruitment of talented students also from outside Italy and by facilitating the opportunity for TIGEM researchers and students to interact and collaborate with foreign laboratories. Notwithstanding, TIGEM also collaborates with local universities (the Università degli Studi di Salerno-UNISA) to promote additional graduate training for Italian students.
Goal: The goal of the graduate programme is to prepare doctoral students for research careers in all aspects of human genetics.

Length: 3 (+1) years

Research School, Awarding body: The Open University (OU), Milton Keynes, UK

Affiliated Research Centre: The Telethon Institute of Genetics and Medicine (TIGEM), Naples, IT

Graduate programme Coordinator: Sandro Banfi

Training: The sponsoring establishment provides coursework, a high-tier programme of scientific seminars, and an annual data club programme throughout the graduate curriculum. Moreover, graduate students also participate in the two-day TIGEM retreat, which is organized every 18 months, and includes scientific presentations, poster sessions and intense dialogue about new discoveries and research strategies.

Supervision and Mentoring: Graduate students are constantly monitored throughout the graduate curriculum. Each student is assigned a supervisor (or tutor), a co-tutor (optional) and an external supervisor with whom the student meets periodically to discuss his/her research progress. A written report, as well as an oral presentation, summarizing the student’s progress in thesis work, is due at the end of each year, according to OU and TIGEM rules. Moreover, a meeting with an ad hoc on-site Thesis Committee of staff members and with a Third Party Monitoring member, who are both appointed to help students in their path towards the obtainment of their PhD, are also compulsory and scheduled on an annual basis.

Working language: English

Fellowship: Financial support is provided to all the students participating in the programme, either by TIGEM fellowships or external grants for the perspective three (or four)-year period.

Key dates:
- Application: May
- Examination: September
- Starting date: October

Goal: The aim of the graduate programme is to promote the training of young scientists in the field of post-genomics and molecular medicine, with a particular focus on genetic diseases.

Length: 4 years

Research School, Awarding body: Università degli Studi di Napoli Federico II, Naples, IT

Sponsoring establishment: The Telethon Institute of Genetics and Medicine (TIGEM), Naples, IT

Collaborating establishment/s: The Centre for Genetic Engineering (CEINGE), Naples, IT
The Stazione Zoologica Anton Dohrn of Naples (SZN), Naples, IT

Graduate programme Coordinator: Diego di Bernardo

Training: The sponsoring establishment provides coursework, a high-tier programme of scientific seminars, and an annual data club programme throughout the graduate curriculum. Moreover, graduate students also participate in the two-day TIGEM retreat, which is organized every 18 months, and includes scientific presentations, poster sessions and intense dialogue about new discoveries and research strategies.

Supervision and Mentoring: Graduate students are constantly monitored throughout the graduate curriculum. Each student is assigned a supervisor (or tutor), a co-tutor and an external supervisor with whom the student meets periodically to discuss his/her research progress. A written report, as well as an oral presentation, summarizing the student’s progress in thesis work, is due at the end of each year, according to SEMM and TIGEM rules. Moreover, a meeting with an ad hoc on-site Thesis Committee of staff members, who are appointed to help students in their path towards the obtainment of their PhD, is also compulsory and scheduled on an annual basis.

Working language: English

Fellowship: All the students participating in the programme are supported either by SEMM fellowships or external grants for the perspective four-year period.

Key dates:
- Application: July-September
- Examination: November
- Starting date: January (1st day of the month every year)
PhD Programme in Computational Biology and Bioinformatics

Goal:
The aim of the graduate programme is to train young researchers in the field of computational biology and bioinformatics by applying information technologies and chemical, physical and mathematical modelling to biology and medicine.

Length: 3 years

Research School, Awarding body: Università degli Studi di Napoli Federico II, Naples, IT

Sponsoring establishment:
The Centre for Genetic Engineering (CEINGE), Naples, IT
The Stazione Zoologica Anton Dohrn of Naples (SZN), Naples, IT
The Institute of Genetics and Biophysics (IGB), Naples, IT
The Centre for Complexity Science, University of Warwick, Coventry, UK

Collaborating establishment/s:
The Telethon Institute of Genetics and Medicine (TIGEM), Naples, IT

Graduate programme Coordinator: Sergio Cocozza

Training:
The sponsoring establishment provides coursework, a high-tier programme of scientific seminars, and an annual data club programme throughout the graduate curriculum. Supplementary courses, ranging from basic biology to physical/mathematical modelling and data analysis, are provided by the Research School. Moreover, graduate students also participate in the two-day TIGEM retreat, which is organized every 18 months, and includes scientific presentations, poster sessions and intense dialogue about new discoveries and research strategies.

Supervision and Mentoring:
Graduate students are constantly monitored throughout the PhD programme. Each student is assigned a supervisor (or tutor) and a co-tutor, belonging to the PhD programme faculty, with whom the student meets periodically to discuss his/her research progress. A written report, as well as an oral presentation, summarizing the student’s progress in thesis work, is due at the end of each year, according to UNINA and TIGEM rules. Moreover, a meeting with an ad hoc on-site Thesis Committee of staff members, who are appointed to help students in their path towards the obtainment of their PhD, is also compulsory and scheduled on an annual basis.

Working language: English

Fellowship:
The number of available fellowships is approved from year to year. Fellowships are awarded by the Research School to the highest-ranking candidates, among those admitted, for the perspective three-year period. Additional financial support can be provided by TIGEM or external grants.

Key dates:
- Application: September-November
- Examination: December
- Starting date: January

1 Foreign students may also apply to a special selection, whose key dates differ from those described above (more details given in section Admission Procedure but consult also the UNINA web site: http://www1.unina.it/PhDbioinformatica/index-en.htm).

PhD Programme in Medical Genetics

Goal:
The goal of the graduate programme is to provide doctoral students with a solid foundation for a research and/or teaching career in molecular, cell and human genetics. The PhD in medical genetics attributes the additional certificate Doctor Europaeus¹.

Length: 3 years

Research School, Awarding body: Seconda Università degli Studi di Napoli, Caserta, IT

Sponsoring establishment:
The Telethon Institute of Genetics and Medicine (TIGEM), Naples, IT

Graduate programme Coordinator: Vincenzo Nigro

Training:
The sponsoring establishment provides coursework, a high-tier programme of scientific seminars, and an annual data club programme throughout the graduate curriculum. The Research School also organizes an annual programme of courses that students are expected to attend. Moreover, graduate students also participate in the two-day TIGEM retreat, which is organized every 18 months, and includes scientific presentations, poster sessions and intense dialogue about new discoveries and research strategies.

Supervision and Mentoring:
Graduate students are constantly monitored throughout the graduate curriculum by their supervisor (or tutor) who guides the student from matriculation to thesis defence. A written report, as well as an oral presentation, summarizing the student’s progress in thesis work, is due at the end of each year, according to SUN and TIGEM rules. Moreover, a meeting with an ad hoc on-site Thesis Committee of staff members, who are appointed to help students in their path towards the obtainment of their PhD, is also compulsory and scheduled every year.

Working language: English and Italian

Fellowship:
The most outstanding students participating in the programme are supported either by SUN fellowships or Telethon grants for the perspective three-year period. MIUR (Ministero dell’Università e della Ricerca) can grant additional fellowships.

Key dates:
- Application: September
- Examination: November-December
- Starting date: January

¹ This designation can be added to a national doctorate, which was obtained fulfilling four conditions regarding co-supervision, assessment by an international jury, multilingualism and mobility of the graduate (for more details refer to www.stat.unipd.it/uploads/File/dottorato/PhD_label_it.pdf).
### Quick Facts

**PhD Programme in Human Genetics - Study Plan**

<table>
<thead>
<tr>
<th></th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matriculation</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Courses</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Seminars</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Data clubs</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Thesis Research</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Probationary Period Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External supervisor Meeting &amp; Discussion</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
</tr>
<tr>
<td>Thesis Committee Oral Presentation, Meeting &amp; Discussion</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td></td>
</tr>
<tr>
<td>Third Party Meeting &amp; Discussion</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
</tr>
<tr>
<td>Thesis writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis submission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis defence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Timing of the various educational activities (courses, seminars, data clubs), reports due and meetings with Committee members, year by year (black bars: compulsory; grey bars: facultative). The academic year starts in September (S) and ends in August (A).

### PhD Programme in Molecular Medicine - Study Plan

<table>
<thead>
<tr>
<th></th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matriculation</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Courses</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Seminars</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Data clubs</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>Thesis Research</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
<tr>
<td>PhD Thesis Proposal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External supervisor Meeting &amp; Discussion</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
</tr>
<tr>
<td>Thesis Committee Oral Presentation, Meeting &amp; Discussion</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td>YEARLY BASIS</td>
<td></td>
</tr>
<tr>
<td>Annual Oral Presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis submission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis defence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Timing of the various educational activities (courses, seminars, data clubs), reports due and meetings with Committee members throughout the graduate programme (black bars: compulsory; grey bars: facultative). The academic year starts in January (J) and ends in December (D).
PhD Programme in Computational Biology and Bioinformatics - Study Plan

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matriculation*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Courses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seminars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data clubs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis Research</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhD Thesis Proposal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis Committee Oral Presentation, Meeting &amp; Discussion</td>
<td>YEARY BASIS</td>
<td>YEARY BASIS</td>
<td></td>
</tr>
<tr>
<td>Annual Oral Presentation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis writing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis submission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis defence</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Timing of the various educational activities (courses, seminars, data clubs), reports due and meetings with Committee members on an annual basis (black bars: compulsory; grey bars: facultative). The academic year starts in November (N) and ends in October (O).

* Although the month of matriculation is January, it is officially backdated to November, which defines the beginning of each academic year.
Admission Procedure

All graduate programmes are open to both national and foreign students with no restrictions of nationality, gender, culture, race or religion. Suitable applicants will be evaluated on the basis of their previous academic achievement, scientific potential and motivation to excel in their doctoral programme, and letters of recommendation. All the graduate students admitted to any of the four PhD programmes are supported by a fellowship for the perspective three- (or four) year period.

Which graduate programme to choose

Although TIGEM’s graduate programmes are addressed to both national and foreign students, the OU PhD programme, which awards the student with a UK PhD title, is especially designed for foreign students wanting to spend part of their graduate studies in Italy. However, the OU PhD programme is also configured for Italian students with the goal of obtaining a PhD title that is recognized internationally and thus favours mobility to a foreign country. Supervision and mentoring throughout the student’s graduate studies as well as doctoral thesis writing and oral defence follow UK PhD standards.

In contrast, the UNINA and SUN PhD programmes are ideal for Italian students not only for the fact that the student is awarded an Italian PhD title but also considering that application and selection to the graduate programmes, as publicly advertised in the UNINA and SUN web sites or official gazettes, occur according to Italian university rules.

Finally, the SEMM PhD programme can include both Italian and foreign students since the selection process, and supervision and mentoring of the student throughout the graduate studies follow international standards, although students are conferred with an Italian PhD title.

Eligibility

All applicants must hold a second level academic degree, the Italian Laurea Specialistica, Master of Science, or equivalent, from an accredited university or college before matriculation. Applicants expecting to be awarded their university degree can also apply, provided they receive the award before the examination date on pain of exclusion from the selection.

The following list of scientific academic degrees are considered valid for application:
- Bioinformatics
- Biological sciences
- Biomedical engineering
- Biotechnology
- Chemistry
- Dentistry (except for SUN)

1 Considering the multi-disciplinary nature of the PhD programme in computational biology and bioinformatics, the Research School has fixed no specific limitations to the kind of scientific academic degrees valid for application.

How to apply

The admission procedure requires the student to submit for application, independently of the graduate programme you choose. A call for application is launched every year through the TIGEM web site (www.tigem.it) where interested students may find all the details relative to the application process (application forms, templates of letters of recommendation, important notes, etc.) as well as other information of interest.

Letters of recommendation are an essential part of the application for most graduate programmes. TIGEM prefers recommendations from instructors who are familiar with the applicant’s work and with the field the candidate is expected to study.

The specific details on how to apply are described in the following pages and are given separately for each graduate programme.

OU PhD programme

Candidates applying to the OU PhD programme should submit the application form and two reference letters, by post or by e-mail (see contact details below; for the application form and reference letter template please consult the TIGEM web site).

The deadline for application is the 31st May (of each year).

Applicants should inform their referees of their application to the OU PhD programme and provide them with the appropriate template, which can be downloaded directly from the TIGEM web site. Reference letters sent by post should always be placed in sealed envelopes and signed by the referee at the back of the envelope, and may be sent together with the application form (by the student), or separately (by the referee). Reference letters may also be sent by e-mail but only by the referees, as indicated below.

Ms Barbara Zimbardi
TIGEM
Via P. Castellino 111
80131, Naples
Italy
Fax: +39-081-6132351
e-mail: phd.programme@tigem.it

It is important to underline that:
1. Applications not accompanied by reference letters will not be taken into consideration;
2. It is the applicant’s responsibility to ensure that the referees fill in the appropriate template and send the letters within the deadline for application, and
3. Letters of recommendation may also be sent directly by the student, together with the application form, provided the student receives the reference letters from the referees in a sealed envelope and signed at the back of the envelope by each referee.
**SEMM PhD programme**

Applications are exclusively on-line, as indicated in the SEMM web site (www.semm.it). The application consists of the application form (that can only be submitted through the on-line system available at the time of the call), and two reference letters (that can be downloaded at http://www.semm.it/application_humangenetics.php).

The deadline for application is July-September (the exact date is only available at the time of the call, please consult the SEMM web site).

Applicants should inform their referees of their application to SEMM and provide them with the appropriate template (see above). Referees must then send their references directly to phd@semm.it.

It is important to stress that:
1. Applications not accompanied by letters of recommendation will be discarded;
2. The applicant should make sure the referees fill in the appropriate template and send the letters within the deadline for application, and
3. Letters sent directly by the applicants will not be considered.

**UNINA PhD programme**

Candidates applying to the UNINA PhD programme should submit the application form (Form A for non reserved positions, Form B for reserved positions), which can be downloaded from the UNINA web site (http://www1.na.infn.it/PhDBioinformatica/index-en.htm) and is only available at the time of the call, together with the following documentation:

1. The list of all the documents enclosed in the application (two copies).
2. An official certificate issued by the university for each degree obtained (e.g. Master of Science or equivalent) with the final score and academic curriculum, i.e. a list of all the courses and exams taken with a short description of their contents and corresponding grades obtained.
3. Any further scientific/academic titles and information that according to the candidate should be taken into consideration for application, such as: 1) a list of scientific publications (if any), 2) grants that the candidate might have been awarded by Italian, foreign or international bodies to attend a PhD programme or to carry out study and research activities indicating the starting date, length and amount received, 3) attested attendance of post-graduate courses and post-graduate degrees, 4) awards and other scientific/academic titles, and 5) score of any standard test (particularly valuable are the Graduate Record Examination (GRE)-general and GRE-Biology, Chemistry, Computer Science, Mathematics and Physics tests, consult the web site http://www.ets.org/gre for more details).
4. The CV.
5. One/two reference letters closed in sealed envelopes.
6. The original receipt of payment of € 20,00 (twenty euros), as examination organization fee, which must be paid on postal account n°113803 addressed to Università degli Studi di Napoli Federico II – Corso Umberto I – Napoli, as purpose “Competition for the admission to the Research Doctorate Program in Computational Biology and Bioinformatics in cycle n°...”. In no case will the examination organization fee be reimbursed. Candidates resident abroad are exempted from the payment of the examination organization fee.

The application form, together with the additional documentation, should be sent by certified mail at the following address:

Mammograf Rettore dell’Università degli Studi di Napoli Federico II
Ufficio Dottorato, Assegni e Borse di Studio
Palazzo degli Ufici
Via Giulio Cesare Cortese, 29
80133 Napoli
Italy

2 Students resident in Italy.
3 Students resident abroad.
4 Candidates applying for reserved positions and in possession of a MSc degree awarded by a foreign university that has already been declared equivalent to the Italian degree must indicate the number and date of the Decree by which the Rector of the Italian university has declared it as equivalent. Candidates not in possession of such declaration of equivalence must make express request to the Italian consul authorities to obtain the legal translation (with declaration of value) of the degree award obtained abroad. All other documents and titles, as listed in point 3., may be presented in English, French or Spanish (or alternatively translated into one of the said languages) and certified for conformity to the original.

The application form should be sent by certified mail at the address indicated hereunder:

Dirigente della Ripartizione degli Affari Generali
Seconda Università degli Studi di Napoli
Piazza Luigi Miraglia, Palazzo Bideri
80138 Napoli
Italy

together with the following documentation:
1. The list of all the documents enclosed in the application (two copies).
2. An official certificate issued by the university for each degree obtained (e.g. Master of Science or equivalent: see UNINA PhD programme for equivalence of degree) with the final score, or, alternatively, a substitutive declaration of conformity to the original (pre-formatted form available at the SUN web site).
3. Any further scientific/academic titles and information that according to the candidate should be taken into consideration for application, such as: 1) the degree thesis (original or copy of the original), 2) language skills and other certified abilities, 3) study and research experiences in Italy and abroad, 4) grants and awards, and 5) attested attendance to post-graduate courses and post-graduate degrees.
4. The original receipt of payment of € 50,00 (fifty euros), as examination organization fee, which must be paid to any Unicredit Banca di Roma agency by compiling the pre-formatted SUN web site for more details on the procedure. In case the examination organization fee be reimbursed. Candidates resident abroad are exempted from the payment of the examination organization fee.

The sentence “Domanda di ammissione ai corsi di Dottorato di Ricerca...” must be written on the envelope.

The deadline for application is September-October (the exact date is only available at the time of the call, please consult the SUN web site).

Candidates will not be admitted to the final selection if the application form:
1. Lacks any of the documents listed above;
2. Does not reach the Research School within the deadline for application;
3. Is not duly signed by the candidate;
4. Has not been recorded following the on-line registration procedure (non reserved positions only), and
5. Has missing personal data (name, place and date of birth, contacts) (reserved positions only).

**SUN PhD programme**

Applying to the SUN PhD programme requires the submission of the application form, which can be downloaded from the SUN web site (www.unina2.it - Concorsi gare e bandi – Concorsi per gli studenti – Ammissione ai corsi di dottorato di ricerca) and is only available at the time of the call. Moreover, candidates resident in Italy should also sign to the graduate programme following the on-line registration procedure (for more details refer to www.unina2.it - servizi On-line – Studenti – concorsi on-line).

The application form should be sent by certified mail at the address indicated hereunder:

Magnifico Rettore dell’Università degli Studi di Napoli Federico II
Ufficio Dottorato, Assegni e Borse di Studio
Palazzo degli Ufici
Via Giulio Cesare Cortese, 29
80133 Napoli
Italy

The sentence “Concorso di Dottorato di Ricerca ... Ciclo – Inoltro urgente Ufficio Dottorato, Assegni e Borse di Studio” must be written on the envelope containing the application. Candidates not in possession of such declaration of equivalence must make express request to the Italian consul authorities to obtain the legal translation (with declaration of value) of the degree award obtained abroad. All other documents and titles, as listed in point 3, may be presented in English, French or Spanish (or alternatively translated into one of the said languages) and certified for conformity to the original.
Selection
Admission to the programme is granted on a competitive basis and on the student’s distinguished ability to excel in the doctoral programme. A preselection generally takes place soon after the deadline. An ad hoc Examination Board screens the applications received and short lists candidates on the basis of the information provided in the application form and in the reference letters (OU, SEMM, UNINA), or additional documentation (UNINA, SUN). The Examination Board attributes a score to each candidate; a minimum score is required to be admitted to the graduate programme.

Only pre-selected candidates are invited to TIGEM or to the Research School and admitted to the examination process. Candidates must be in possession of a legally valid ID card or equivalent to take the exams. The examination differs slightly among graduate programmes.

Details are given separately for each graduate programme (see below).

OU PhD programme
The exam is held in English and consists of:
- an oral seminar on the experimental work carried out by the candidate during his/her undergraduate studies, or the results of the student’s past experience in a research laboratory, and
- individual interviews with TIGEM group leaders as an assessment of the applicant’s scientific potential and motivation.

Knowledge of English is assessed during the interviews and seminar presentation.

SEMM PhD programme
The exam is held in English and consists of:
- a written exam (multiple choice test) on general aspects of biochemistry, molecular and cell biology, and genetics, and
- an oral exam aimed to evaluate the scientific background of the candidate, as well as his/her motivation to succeed in a demanding programme.

Knowledge of English is assessed during the written and oral exams. Individual interviews with TIGEM group leaders or faculty members are foreseen after the oral examination as an additional assessment of the applicant’s scientific potential and motivation.

UNINA PhD programme
The examination is held in Italian, except for foreign students who will hold the exam in English, and consists of:
- a written essay on a subject regarding computational biology and bioinformatics (1 h), and
- an oral exam designed to assess the preparation attainment and general aptitude of the candidate for scientific research.

Candidates for reserved positions many also apply to a special selection, which is solely based on the assessment of the scientific/academic titles, qualifications and references as submitted during application. Knowledge of English is assessed during the oral exam and consists of reading a scientific text in English out loud and translating it into Italian (Italian students), or making a critical revision of a scientific text in English to test the comprehension of the text (foreign students).

Individual interviews with TIGEM group leaders or faculty members may be required after the oral examination as an additional assessment of the applicant’s scientific potential and motivation.

SUN PhD programme
The exam is held in Italian, with the exception of foreign students who will hold the exam in English, and consists of:
- an oral exam on a subject concerning genetics (1 h), and
- an oral exam aimed at evaluating the scientific background of the candidate, as well as his/her motivation to succeed in a challenging programme.

Candidates for reserved positions may also apply to a special selection, which is solely based on the assessment of the scientific/academic titles, qualifications and references as submitted during application.

Knowledge of English is assessed during the oral exam and consists of reading a scientific text in English out loud and translating it into Italian (Italian students), or making a critical revision of a scientific text in English to test the comprehension of the text (foreign students).

Individual interviews with TIGEM group leaders or faculty members may be required after the oral examination as an additional assessment of the applicant’s scientific potential and motivation.

Fellowship
All the graduate students admitted to any of the four PhD programmes are supported by a fellowship provided by the Institute or the Research Schools for the perspective three- (or four) year period. The current annual, gross salary for doctoral students studying at TIGEM is, on average, between euro 16,000,00-18,000,000 per year.
All graduate students enrolled at TIGEM, irrespective of the PhD programme they join, are expected to participate to the following throughout their graduate studies:

### Training
- Attendance to thematic courses during the first years of their study
- Participation to a high-tier programme of scientific seminars on an annual basis
- Participation to an annual programme of data clubs

### Research
- Perform full-time research activity in a TIGEM research group

### Review
- Submit the PhD Thesis Proposal at the end of the first year of study
- Present their data and research progress in a lab data club once a year
- Meet with the on-site Thesis Committee on a yearly basis

Additional requirements that are specific to each graduate programme are described elsewhere (see TIGEM Graduate Programmes: Quick Facts; more details also given in sections: The First Year, The Following Years).

---

**The Credit System: How does it Work?**

According to the European Credit Transfer and Accumulation System (ECTS), any kind of programme classified as higher education (including graduate programmes) is evaluated by a fixed number of credits that students must score each year by carrying out a series of activities during their graduate studies. This credit workload is necessary for students to obtain the final award of the PhD degree.

Generally, one academic year corresponds to 60 ECTS-credits (or CFU which stands for crediti formativi universitari) irrespective of standard or qualification type and is used to facilitate transfer and progression throughout the European Union.

TIGEM has decided to comply with the above credit system. All PhD students at TIGEM, irrespective of the graduate programme they join (OU, SEMM, UNINA, SUN) or university of enrollment, are asked to follow the training activities (see below) organized by TIGEM or the Institute’s collaborating establishments to gain their credit workload year by year.

All graduate students enrolled at TIGEM must therefore achieve at least 280 credits (60 CFU per year) for the duration of their graduate studies (both for 3yrs and 4yrs PhD programmes). Credits are calculated on the basis of the number of hours of attendance to courses and other training activities. The composition and distribution of credits by year is generally discussed in agreement with the student’s supervisor who may give the student his/her advice in choosing the courses and other training activities that may fill relevant knowledge gaps and balance the whole study career, from a disciplinary point of view.

Graduate students can gain credits by following:

1. **Compulsory courses** organized by the graduate programme;
2. **Compulsory seminars and data clubs** organized by TIGEM on an annual basis, and
3. **Additional seminars, short courses, workshops and tutorials** organized by other institutes.

As a record of their training participation and attainment as a PhD student, all graduate students are provided with a Personal Progress Log (or logbook) soon after matriculation, which summarizes the main training and reviewing activities (courses, seminars, data clubs, annual meetings) students must undergo for each year of their graduate studies. The purpose of the logbook is thus to help students in planning their own training and in recording the outcomes. Also, the format of the logbook, which is largely constituted by pre-filled forms, is easy and straightforward so that students can find what they are looking for fast and fill in the empty gaps as their research and training activities proceed.

According to TIGEM rules, the logbook belongs to the graduate student and it is the student’s responsibility to keep it up to date and to ensure that the supervisor be aware of the training activities s/he has in plan to undertake.

---

1 ECTS is defined as “a standard for comparing the study attainment and performance of students of higher education across the European Union and other collaborating European countries. Note that the credit points towards a PhD are not formally awarded in the UK system.”
The first year of the curriculum is crucial for students to rapidly adjust to the intensive educational experience that lies behind the attainment of a PhD degree. Soon after matriculation (autumn-winter term), students are matched with a supervisor and a TIGEM research group, where they will conduct their research project throughout their graduate studies. Doctoral research and educational activities are carried out in parallel from the very beginning. In fact, during the autumn-winter term students are expected to participate in the seminars and data clubs organized on a weekly basis as well as conduct doctoral research. During the subsequent spring term students are also faced with a 12-week course term that extends from the beginning of March to the end of May. Seminars and data clubs are also provisioned throughout the spring and summer terms.

By the end of the first year, students present the PhD Thesis Proposal (details given below) in which they introduce the topic under study and outline the experiments to be accomplished during the subsequent three years (two years for UNINA and SUN students). Students are expected to present their proposal for research also as an oral presentation and both are evaluated by an ad hoc Thesis Committee, composed of the student’s supervisor and two other readers (TIGEM group leaders or mature PostDocs). The student may also be asked to rewrite the proposal or even to resign, should s/he not satisfy the minimal requirements as evaluated by the commission. After the requirements of the thesis proposal and oral presentation are satisfied, students focus on the research project proposed.

Other than for the evaluation of the PhD Thesis Proposal, the Thesis Committee, appointed for each student at the beginning of his/her graduate curriculum, meets periodically with the student to discuss research progress.

For more details concerning the study plan of each TIGEM PhD programme, please consult Study Plan at a Glance in section TIGEM Graduate Programmes: Quick Facts.

Getting settled in
The month of matriculation, which defines the starting date of your PhD, depends on the graduate programme you join and is generally October for the OU (PhD programme in human genetics), November for UNINA (PhD programme in computational biology and bioinformatics) and SUN (PhD programme in medical genetics), or January for SEMM (PhD programme in molecular medicine).

By the end of the first year, students present the PhD Thesis Proposal (details given below) in which they introduce the topic under study and outline the experiments to be accomplished during the subsequent three years (two years for UNINA and SUN students). Students are expected to present their proposal for research also as an oral presentation and both are evaluated by an ad hoc Thesis Committee, composed of the student’s supervisor and two other readers (TIGEM group leaders or mature PostDocs). The student may also be asked to rewrite the proposal or even to resign, should s/he not satisfy the minimal requirements as evaluated by the commission. After the requirements of the thesis proposal and oral presentation are satisfied, students focus on the research project proposed.

Other than for the evaluation of the PhD Thesis Proposal, the Thesis Committee, appointed for each student at the beginning of his/her graduate curriculum, meets periodically with the student to discuss research progress.

For more details concerning the study plan of each TIGEM PhD programme, please consult Study Plan at a Glance in section TIGEM Graduate Programmes: Quick Facts.
The First Year

Skills audit/ePortfolio
The skills audit is compulsory for OU students only and should be completed soon after commencing the PhD project. It consists of a series of questions, each relating to particular skills or sets of skills (A, B, C, D, etc.) that the student may already have acquired by past experiences (answer “yes”), for which the student may need additional training before becoming confident about that skill (answer “no”), or that may even be irrelevant to the student’s particular research project (answer “not applicable”).

The Research School provides the student with a date by which the audit should be completed, agreed with the supervisor and submitted to the student’s ePortfolio. In consultation with the supervisor, the student should complete a benchmark assessment of his/her research skills in the categories specified. The student and the supervisor can then decide what training is needed, which the student may need additional training before becoming confident about that skill (answer “no”), or that may even be irrelevant to the student’s particular research project (answer “not applicable”).

The research proposal is evaluated by an ad hoc Thesis Committee, composed of the student’s supervisor and two other readers (TIGEM group leaders or mature PostDocs). The student is expected to make an oral presentation of the proposal for research to the thesis commission and should therefore hand a copy of the proposal to the commission one week before the oral defence. The oral defence consists of a short presentation followed by a discussion during which the student is asked to respond to questions raised by the commission to establish the student’s depth of knowledge and analytical ability on the thesis topic. Usually, this presentation coincides with a TIGEM data club and therefore will consist of a first session open to all TIGEM researchers and of a second session whose participation will be restricted to the student and the thesis commission. If the thesis commission considers that the proposed experiments do not address the question under study suitably or the student is not able to defend the proposal appropriately, the student will be asked to rewrite the proposal or, in extreme cases, of presenting the research progress year by year.

Finally, OU students only are expected to submit a Probationary Period Report at the end of the first year (11 months after matriculation) that substitutes and is equivalent to the ePortfolio. Students and supervisors will be informed by the Research School in due time of the deadline as well as being provided with the appropriate forms for probationary period report submission. Moreover, before the submission of the Probationary Period Report, OU students must also sustain an oral discussion (mini-viva) in which they defend their research project and progress, as outlined in the report, to the members of the Thesis Committee (excluding the student’s Director of studies) or to two other TIGEM investigators. The mini-viva can be considered as an “exercise” to the proper viva of the doctoral thesis that the student will have to defend at the end of his/her graduate studies.

Supervision and Mentoring
During the first year, the student chooses two staff members (TIGEM group leaders, or mature PostDocs) who will form his/her on-site Thesis Committee, with the duty of supervising and following students’ thesis work and research progress year by year. The student is expected to discuss the data and developments of his/her doctoral research project in a public session (generally a TIGEM data club) once a year and in the presence of the committee members. The presentation will thus consist of a first session open to all TIGEM researchers and of a second session whose participation will be restricted to the student and the thesis committee. In addition, complying with Italian university rules, SEMM, UNINA and SUN students are asked to make an Annual Oral Presentation of their doctoral research progress, which must be presented to an ad hoc commission appointed by the Research Schools.

Students joining the international PhD programmes (OU, SEMM) are also assigned an external supervisor, having previous experience in student supervision in the British academy, with whom the student meets at the end of the first year of study to monitor the progress in thesis work, and to discuss future strategies and individual problems with the on-site Thesis Committee.

Finally, a system of support, which has been introduced by The Open University and is therefore restricted to OU students, is the Third Party Monitoring, i.e. a research staff member of the sponsoring establishment (appointed in agreement with the Research School) with whom the student meets once a year with the aim of 1) providing pastoral support for the student outside the supervisory environment, 2) identifying and resolving potential problems, 3) including resource management problems (staff time, equipment, technical issues, etc), and, more importantly, 4) providing a dispassionate and impartial view if difficulties arise.
The Following Years

After fulfilling the requirements of the PhD Thesis Proposal, presented at the end of the first year, students concentrate their efforts on their research project. Nonetheless, course work continues also during the following years of their graduate studies. In fact, students follow a 4-week course term, which normally spans the month of May, during the second year and a further 1-week course term, which generally takes place in mid-September, during the third year. Seminars and data clubs attendance is also expected during the subsequent years of the graduate curriculum. Students’ research progress continues to be reviewed year by year by the Thesis Committee and by the students’ external supervisors. During the last year, students submit a written doctoral thesis, describing their original research, and are awarded the PhD degree after successful thesis defence.

Please refer to Study Plan at a Glance for more details concerning the study plan of each TIGEM PhD programme.

Course term, Seminars, Data clubs

Although course instruction is particularly intense during the first year, it continues also for the following years of the student’s graduate studies. During the second year, students follow a series of advanced courses spanning the month of May, while during the third year students attend the science management courses, that are generally limited to one week (mid-September). As for the first year, UNINA and SUN students, in particular, are also expected to follow an additional annual programme of courses provided by the university of enrollment.

Graduate students continue to attend the seminar series and data club programme organized by TIGEM every year on a weekly basis and spanning from October to June, during the following years of their PhD.

Written Reports

By the end of each year, students present an annual written report, in which they describe the results accomplished during the year regarding their working research hypothesis, the problems encountered and changes envisioned in the research project (if any), the future research strategies and possible outcome of the doctoral research project.

For OU students, in particular, the annual written report is submitted always in March. Students and supervisors will be informed by the Research School in due time of the deadline as well as being provided with the appropriate forms for annual report submission.

Supervision and Mentoring

The Thesis Committee, appointed for each student at the beginning of the first year, remains a reference to the student also for the subsequent years of his/her graduate studies. Likewise the first year, the student is expected to discuss about the data and developments of his/her doctoral research project in a public session (generally a TIGEM data club) once a year and in the presence of the committee members, followed by the feedback session restricted to the student and the thesis committee. During the third year, if the student fulfills the requirements as evaluated by the commission, s/he will receive the official authorization by the Thesis Committee to write the doctoral thesis.

In addition, UNINA, SEMM and SUN students must present their doctoral research progress as an Annual Oral Presentation to an ad hoc commission appointed by the Research Schools.

Meetings with the student’s external supervisor (OU and SEMM students) and with the Third Party Monitoring staff member (OU students only), who are appointed to help students in their path towards the attainment of their PhD, are also envisioned and scheduled on an annual basis.

Thesis writing and Oral Defence

During the last year of the graduate programme, students submit a written doctoral thesis, which is evaluated by expert readers and then presented and discussed in a public lecture attended by the supervisors and by an External Examination Committee. A high quality publication of the experimental work carried out during the research period, or at least submission of a manuscript concerning such work, is required prior to the discussion of the doctoral thesis.

For OU students only, the oral defence of the doctoral thesis is behind closed doors and the participation is restricted to the student, the student’s supervisor (optional, s/he may only act as observer), and the Examination Panel. The latter is nominated by the student’s supervisor following the appointment criteria regulated by the Research School, and must be approved by the OU Research Degrees Committee before the student submits his/her doctoral thesis.

A satisfactory thesis defence and fulfillment of the necessary credit workload for educational activities results in the award of the PhD degree.

TIGEM graduate programmes are designed in order for students to complete their doctoral studies within three to four years.
TIGEM offers graduate students a variety of training activities (courses, seminars, data clubs) with the aim of providing students with a solid foundation for a research and/or teaching career in medical or human genetics, computational biology and bioinformatics, or molecular medicine.

Over the last years, the Institute has decided to unify its courses and other curriculum activities to all graduate students, independently of the PhD programme they join, in order to have a uniform and coherent study plan and also to ease the Institute’s organization and management effort. Graduate students are asked to follow the training activities provisioned year by year to gain their annual credit workload that is necessary to obtain their final PhD award (for more details see section The Credit System: How does it Work?).

Courses
Courses are provided during the first three years and include basic (1st year), advanced (2nd year), and science management (3rd year) courses. Course work is particularly intense during the first year as it consists in a 12-week course term, spanning from March to May, and gradually diminishes during the following years (4-week course term, 2nd year; 1-week course term, 3rd year) as students become more and more involved with their doctoral research project.

Each course, generally lasting a week, consists of both theory and practical activities (journal Clubs, Lab sessions) and is taught by a small group of faculty members, among TIGEM’s research staff or belonging to other collaborating establishments, who work closely in team to develop and present a cohesive and organic course. As already previously described, UNINA and SUN students are also expected to follow an additional annual programme of courses provided by the universities of enrollment (refer to the universities web sites: www1.na.infn.it/PhDBioinformatica/index-en.htm for UNINA and www.unina2.it for SUN).

Seminar series
In the context of training activities, TIGEM promotes a high-tier programme of scientific seminars that are held at the Institute on a weekly basis, spanning from September to June. Each year, graduate students attend the annual seminar series, which includes internal seminars, given by the graduate students themselves or by the research staff within the CNR Research Complex, and seminars given by invited speakers, that are internationally renowned in the field of human genetics, developmental biology, functional genomics, inherited eye diseases, metabolism and systems biology, among others.

Data clubs
The data club programme is also organized every year and like the seminar series is scheduled once a week, from September to June. The intent of the data clubs is to improve the student’s language and presentation skills and make the student actively participate in collective debates on scientific data, favouring internal communication within his/her research group as well as stimulating exchange among research groups.

Students are expected to participate to the data clubs and present their data at a data club once a year, which is also attended by the Thesis Committee members from whom the student should obtain feedback following the public oral presentation (for more details see Supervision and Mentoring in sections: The First Year, The Following Years).

Web resources
A general description of the graduate programmes offered at TIGEM, including the admission procedure, is available on the TIGEM web site (www.tigem.it). A call for application is launched every year through the web site where those interested may download the application form, available at the time of the call. Several web resources have been made available to the students in these years, including the annual programme of scheduled dates of seminars and data clubs (with attached articles for invited speakers), and courses. PPT presentations of the courses attended are also accessible to the students through the web.

Work is in progress to give further emphasis and awareness of TIGEM’s educational programmes through the Institute’s web site, by providing the general public with a new, clearer and more focused, format of each graduate programme as well as by implementing the web site with a “Students Area”, which is password protected and restricted to students use.

Retreat
Graduate students also participate in the TIGEM retreat, which is organized every 18 months in an informal setting to encourage scientific exchange, and communication and bonding among members of the research staff. The retreat lasts two-three days and includes scientific presentations, poster sessions and special activities. As an example, the last TIGEM retreat, which was held at Città di Castello, a medieval and sweet little town in central Italy, was highlighted, other than for the excellent presentations and poster sessions, by the creation of the “TIGEM anthem” and, as special activity, by the “TIGEM Olimpic Games” where staff members and students competed against each other trying their strength and skills in various disciplines (e.g. Potato race, Tug-of-War, Piggy-back race, etc.).
See following pages for the full list of courses offered to TIGEM graduate students. Below is the full list of courses offered to date to TIGEM graduate students.

COURSES

1st YEAR

1) Scientific Methodology
   • Introduction to scientific methodology
   • How to write a scientific paper: basics, scientific English
   • Statistical analysis of data
   • Experimental design
   • Bioethical aspects of medical research
   • Journal Club
   Coordinators: A. Auricchio, D. di Bernardo
   Instructors: A. Auricchio, D. di Bernardo, M.P. Cosma, J. Gilder, E. Surace

2) Bioinformatics
   • Bioinformatic tools for the discovery and analysis of transcriptional regulatory networks
   • DNA sequence analysis
   • Protein sequence analysis
   • Comparative genomics
   • Lab
   Coordinator: D. di Bernardo
   Instructors: D. di Bernardo, G. Paolella

3) Functional Genomics
   • Introduction to functional genomics
   • Statistical analysis of microarray data
   • Next generation sequencing
   • Introduction to systems biology
   • Journal Club
   Coordinator: S. Banfi
   Instructors: S. Banfi, D. di Bernardo, L. Cutillo, M. Mutarelli

4) Proteomics and Structural Biology
   • Biomolecular mass spectrometry
   • Structural and functional proteomics
   • The contribution of structural biology to molecular medicine
   • Analysis of 2-D protein maps
   • Lab
   Coordinator: T. Russo
   Instructors: P. Pucci, M. Monti, A. Zagari, N. Zambrano

2nd YEAR

1) Molecular Basis of Genetics, Diseases and Diagnostics
   • Genomic imprinting and human disease
   • Genetic approaches to the study of complex diseases
   • Molecular diagnosis of heterogeneous genetic diseases: the example of muscular dystrophies
   • Strategies for disease gene identification
   • Journal Club
   Coordinator: B. Franco
   Instructors: M. Ciullo, B. Franco, V. Nigro, A. Riccio

2) Gene and Cell Therapy
   • Viral vectors for gene transfer
   • Cell therapies for human inherited diseases
   • Gene therapy of inherited retinal diseases
   • Gene therapy of metabolic diseases
   • Journal Club
   Coordinator: A. Auricchio
   Instructors: A. Auricchio, N. Brunetti-Pierri, I. Pastore, E. Surace

3) Cell Biology
   • Cell organization and membrane trafficking
   • Endomembranes and bioactive lipids
   • Signal transduction
   • Cell cycle
   • Journal Club
   Coordinators: A. De Matteis, I. Lurani
   Instructors: A. De Matteis, A. Luini, S. Mariggiò, R. Polishchuk

4) Animal Models of Genetic Diseases
   • General overview of the different animal models used for studying genetic diseases with a special emphasis on the murine model
   • Dissection of the Otx gene functions via multiple transgenic approaches
   • The Medaka fish as animal model for studying genetic diseases
   • ES cells as model system to study mammalian lineage specification and differentiation: convergent pathways in stem cell differentiation and tissue repair
   • Journal Club
   Coordinator: E. Surace
   Instructors: I. Conte, E. Illingworth, G. Münchhoft, E. Surace

The course of Cell Biology, in particular, has been introduced starting from this year in substitution of the course in Genomics and Proteomics for the Study of Genetic Diseases.

3rd YEAR

1) Science Management
   • Team management
   • Grants
   • Science and the Media
   • Ethical issues
   Coordinator: F. Salvatore
   Instructors: G. Boniolo, G. Díez Roux, G. Giannini, J. Gilder, I. Mearelli, R. Musto, M. Pitterà, F. Salvatore

6) Mammalian Physiopathology
   • Methodologies and general principles of brain phenotyping during mouse embryonic development
   • Principles of behavioural neuroscience
   • Animal models of muscular dystrophies
   • Mouse models of skin diseases
   • Animal models of breast cancer
   • Journal Club
   Coordinator: T. Russo
   Instructors: F. Errico, C. Miserò, V. Nigro, A. Simeone, A. Usiello, M. Zollo
Extracurricular Activities

For a graduate student, life at TIGEM is much more than attending courses, seminars and data clubs and performing full-time research. The Institute involves students in many extracurricular activities, such as the soccer tournament and Biological Cup, which is organized on an annual basis, the performance of famous Neapolitan plays in the city’s public theatres, communicating and interacting with middle and high-school students in the event “TIGEM Open Doors” to increase public awareness on research in genetic diseases, etc. Moreover, graduate students tend to often get together away from working hours (and especially during weekends) to spend an enjoyable evening at the theatre, or cinema, or to rave over a famous Italian or foreign pop-star at a concert together, to share their hobbies, or simply to enjoy live music, and the exquisite Neapolitan cuisine, or a pizza and beer (the equivalent of “Fish & Chips” for the Brits) in one of the several canteens, pubs or restaurants in Naples and beyond.

Drama: for fun & funds!

Traditionally, Neapolitan theatre belongs to a very specific Italian genre, the so-called “Commedia dell’Arte” (Comedy of Art), a professional form of theatre that began in Italy in the mid-16th century. Unlike many genres of theatre this refers mainly to the manner of performance, which is in part structured and in part improvised. Subjects vary from love stories, usually full of intrigue, to plots to steal money, outwit innocents and cause disasters from shipwrecks to fires, all with a humorous appeal.

Traditionally, the Comedy of Art was characterized by masked “types” so that no facial expression was visible but emotions and personality had to be expressed through the body, with exaggerated movements, dancing, juggling and pantomime playing a role in this. Certain characters have become so ubiquitous as to be symbolic of Neapolitan theatre and puppetry, such as the forebears of the modern clown, namely “Arlecchino” (Harlequin), or “Pulcinella”, better known in the Anglo-saxon world as Punch in the Punch and Judy shows popular to this day in England.

A common passion of TIGEM students, ever since 2001, has been to perform famous Neapolitan plays in the city’s public theatres, with a particular interest to those by Eduardo De Filippo, considered among the most famous characters of Italian culture of the twentieth century and having an outstanding variety of interests, from actor, to playwright, to screenwriter, author and poet. The humoresque theatre of “I De Filippo” (the De Filippo’s composed of the trio Eduardo, his brother Peppino and his sister Titina) finds its origins in the unlikely, extravagant and improbable situations, and farce and disguise so typical of the Comedy of Art.

Five drama performances have taken place thus far and all have been a great success, both for the participants and the audience. The present name of the Institute’s amateur drama company, which was originally called “La Nuova Compagnia di Ricerca Popolare” (i.e. The New Company of Popular Research), is “Ricercatori” (from the Italian words “Ricerche” meaning Researcher and “Attore” meaning Actor), showing the common passion of TIGEM students for science and theatre.

In particular, the last two performances, staged in 2009 and 2011, were performed in the famous Neapolitan theatre “Teatro Diana” and were organized to collect money for research (see Fund-raising for more details). These performances saw the participation of many students, from undergrads to PostDocs, and even of TIGEM principal investigators and other staff members. The funds raised by TIGEM students and research staff were donated to the Telethon Foundation for research in human genetic diseases.

The event “TIGEM Open Doors” is a unique opportunity for graduate students and PostDocs to talk to a younger crowd about biology and medicine. Ground knowledge in science is provided to students by a brief intro, generally presented by a TIGEM senior PostDoc, which is focused on Telethon’s mission and, in general, on the study and research of genetic diseases followed by the visit of a series of “lab stations” (i.e. Microscopy lab station, DNA lab station, Animal Models lab station) where, under the supervision of graduate students, middle and high school students can stop, touch or “play” with the equipment that is generally found in a research laboratory (i.e. microscopes, transilluminator for DNA visualization, pipettes, tubes for centrifugation, etc.) and/or explore and understand the techniques adopted (DNA preparation, Immunohistochemical techniques).

From this experience, graduate students learn how to explain their research in more simple terms and, in general, to communicate with a broader audience, which is crucial for public speaking, a necessary prerequisite for a future research or teaching career.

TIGEM dedicated four days last year (2010) to this important and popular event, namely the 5th March, 16th April, 21st May and 4th June. The event, as a whole, saw the participation of roughly 350 middle and high-school students coming from eight schools of Naples and the Campania region.
The Soccer Tournament and “Biological Cup”
The so-called “biological” soccer tournament is organized every year and sees the participation of several research institutes, within and beyond the boundaries of the CNR’s science and technology research complex. It was first introduced in 2004 with the aim of upgrading simple football matches played among friends/colleagues after work and on a weekly basis to a more complex organization in which each individual could share with others the common passion for soccer by feeling part of a football team and yet find a proper identity by playing always in a specific role.

The soccer tournament has the unique mix of competition and fun, and is entertaining whether you are a player or spectator. Approval and encouragement to the TIGEM team, as well as booing the opposing team, are guaranteed by the fans, who cheer and support “TIGEM’s colours” in every match. At the end of the match, both teams (and relative spectators) go out to a pub together so that opponents during the match become friends again and competition is levelled out.

The soccer tournament generally consists of two separate events. The tournament proper spans from the autumn term (Oct-Nov) to the following spring term (Feb-Mar). It involves a considerable number of soccer teams (8-10 on average) representing the following local research institutes:

1. The Telethon Institute of Genetics and Medicine (TIGEM);
2. The Institute of Genetics and Biophysics (IGB);
3. The Centre for Genetic Engineering (CEINGE);
4. The Biotechnology and Molecular Genetics Research Centre (BIOGEM);
5. The Dept. of Biology and Cell and Molecular Pathology (DBPCM);
6. The Stazione Zoologica Anton Dohrn of Naples (SZN), and
7. The Institute for Microelectronics and Microsystems (IMM).

The second event, the so-called “Biological Cup”, is generally organized during the summer months (May-July) and sees the participation of less soccer teams, due to the heat and age of the football team members. Officially, since the soccer tournament’s inception, only two Biological Cups have been conducted thus far. However, there are always a selected number of soccer teams, the TIGEM team being included among these, which continue playing also during the summer months in spite of the sticky and uncomfortable heat to keep their training going!

TIGEM won the soccer tournament in 2004, the first to have ever been organized, while CEINGE has won the tournament over the last three years (for a complete list of events, dates, and winners see the Gold Book below).

As “Capitan Popper” (Stefano Pepe, Technician at TIGEM and Captain of the TIGEM soccer team) would say: “Whether you are or are not a soccer player, or are or are not a fan of soccer in general, the soccer tournament is an experience to live and to share with others; participating to these collective sports events strengthens bonding and friendship more than any other and is a fantastic way of taking a break from our daily routine”.

GOLD BOOK

Biological Soccer Tournaments
- Torneo Biologico di calcetto, 2004, Winner: TIGEM
- Secondo Torneo Biologico di calcetto, 2006, Winner: IGB Castellino
- Terzo Torneo Biologico di calcetto, 2007, Winner: IGB All Stars
- Quarto Torneo Biologico di calcetto, 2007, Winner: CEINGE
- Quinto Torneo Biologico di calcetto, 2008, Winner: CEINGE
- Primo Torneo Biologico di calcetto, 2009, Winner: CEINGE

Biological Cups
- Prima Coppa Biologica, 2004, Winner: SZN EtOH
- Seconda Coppa Biologica, 2008, Winner: BIOGEM
Fundraising

Graduate students may also be involved throughout their graduate studies in fund-raising for research in genetic diseases. The highlight of this activity is the solidarity marathon, broadcasted on the Italian national TV year by year since its inception in 1990 and on which the Telethon Foundation has based its creed (the name Telethon comes from the words TELEvision and maraTHON).

Telethon: the TELEvision maraTHON

Fund-raising for research in genetic diseases, by way of the solidarity marathon broadcasted every year on the Italian RAI TV channels and scheduled in December for 3 days running, is behind Telethon’s success ever since its foundation. In fact, the Italian Telethon was the first solidarity marathon to have ever been presented on the Italian television, increasing public awareness on human genetic diseases and in particular on rare genetic diseases, the most neglected by pharmaceutical companies and the local government. Although largely inspired by former initiatives (Telethon USA, Telethon France, more details given in the official Telethon web site: www.telethon.it), the activity, organization and management of the Italian Telethon Foundation, and of its four intramural research institutes, is completely independent from the other non-profit organizations.

Since 1991, Telethon Italy has invested over 300 mls euros in research and funded 2,261 research projects on more than 400 human genetic diseases, which range from basic research to clinical trials.

The research portfolio includes intramural research (performed in four institutes, including TIGEM) and extramural research through grants to universities, public and non-profit research institutes in Italy.

Telethon’s fund-raising for research in genetic diseases largely depends on the 3-day TV solidarity marathon, which sees the participation of research staff and students from TIGEM, among other research institutes, to TV programmes and talk shows. Researchers and students have the chance through this initiative to talk non-stop for 72 h running about their research activity, illustrating the current progress and future potential in this research field in a completely different setting from the laboratory and to a much broader audience. The heart of the TV marathon are Telethon’s “short stories”, produced by professional movie directors, and describing the life and courage of patients living with a genetic disease. These stories, as well as the interviews to Telethon researchers and students, help in increasing public awareness towards the meaning, social burden, and fight against genetic diseases. As an example, the last solidarity marathon, presented on the RAI TV channels the 17th-19th December 2010, was able to raise over 32 mls euros.

On the facing page is an open letter written first-hand by Francesco Iorio, PhD student at TIGEM, describing his experience in fundraising and how gratifying and fun it was to raise money for Telethon to promote research in genetic diseases.

Although I work largely with numbers (I am a computer scientist), I have always had a strong interest in music ever since I was a child (I used to be a choirboy as a kid). Two years ago, a group of colleagues and myself decided to contribute to the Telethon’s X-mas fundraising campaign by putting together a proper choir with the aim of “singing for research”, i.e. the idea was to prepare a repertory of songs to sing in the city’s public squares and main street to raise funds for the Telethon Foundation.

I’ll never forget the first choir practice… enthusiasm (and disorganization) was at the sky’s limit! A good number of students and researchers turned up wanting to participate but, considering that none of us was a professional singer I, as TIGEM choir Director, had a hard time to find the vocal identity of each person and to obtain a balanced composition of vocal cords. Choir rehearsals (fortunately) grew from strength to strength and we ended up with a choir of mixed voices (males and females), made of four groups, or vocal cords (bass, tenor, contralto and soprano).

The day of our public performance we met up during the afternoon for the final choir practice and decided to go and sing in via Luca Giordano, a very popular street in Naples full of shops and shoppers, dressed with our Telethon bib and holding the Foundation’s banner. It was pouring cats and dogs but we were so determined to reach our goal that we didn’t take any notice of the weather. We sang for nearly four hours flat and people stopped by and listened to us, protecting themselves from the pouring rain with their umbrellas, smiled, gave an offer and left, only to come back with more people! It was like a small miracle. We were soaked to our bones but still smiling and singing to so many people prepared to listen to us under the pouring rain and you had the impression that it was not raining at all. By the end of our performance, all our music sheets were completely blurred, the soaked tuning fork was completely useless and yet each of us seemed to remember his/her part off by heart!

We managed to raise a discrete sum of money for the Telethon Foundation by this initiative, and decided to celebrate the success by going out to a pub together. We were all enthusiastic of our small, but important, contribution towards research. Personally, I found it a lovely and gratifying experience to remember for years to come.
TIGEM is the answer for young and motivated graduate students that are looking for high-quality PhD programmes in medical or human genetics, or molecular medicine. As it happened to me, at TIGEM you will have the incredible opportunity to work at international research projects, to meet qualified scientists every day coming from all over the world and to enjoy doing what you were always dreaming of: i.e. conduct “basic research to cure genetic diseases”. All of these remarkable things together with other internal scientific activities, such as appealing PhD courses and data clubs or weekly seminars, given by world-famous speakers, will make your professional experience at TIGEM turn a fundamental step towards a promising career in the research topics just described. For those of you who are wondering about social life after work…well, I can assure you that all “Tigemians” (or in Italian “Tigemini”) are famous for their extraordinary sense of gregariousness and for their capacity to organize several extra activities, nearly on a weekly basis, away from working hours such as theatre, music, and sports, or even taking part in nice social events. For all of these reasons I am very proud and happy to say: “Thank God there’s TIGEM!”
Daniela Iaconis
SEMM PhD Student
Year of enrollment: 2008

Since I was a child, my dream was to become a researcher, in particular in the medical sciences. I have always been fascinated by the basic, yet complex, mechanisms that regulate the life of an organism. In particular, my main interest has been to understand how the human body is so perfectly and finely-tuned to the environment and what determines its disruption in disease conditions.

The Telethon Institute of Genetics and Medicine (TIGEM) has given me the opportunity as a PhD student to do just this. My interests in fact are in strong agreement with TIGEM’s mission, i.e. to understand the mechanisms of genetic diseases and be able possibly one day to apply therapeutic approaches that may improve the quality of human life.

Research activity at TIGEM is well supported by a number of core facilities that provide scientific and technical support for the experiments. In this way all our work can be focused on research and study.

Lab-meeting and data clubs organized by the Institute have given me the possibility as a student to share and discuss my results with other research groups and to obtain positive and critical feedback. Working at TIGEM has also given me the opportunity to improve my background knowledge, technical skills and to interact with outstanding foreign scientists by participating in the Institute’s seminar series and national and international meetings.

Finally, although research activity is at very high standards and work is hard and challenging, the atmosphere at TIGEM is very informal and friendly. Most of the researchers are young scientists, who often interact among each other and who are willing to talk and discuss about work plans, experiments, ethics, and many other subjects of general scientific interest.

Students also get to meet each other very well since we often organize a lot of extra activities together outside the working hours. So, as a last motto, I would say that if you are interested in the “fight against genetic diseases” then you should come and try joining us since TIGEM is definitely the best place to be!

Luisa Rotundo
SUN PhD Student
Year of enrollment: 2007

My adventure as a PhD student at TIGEM started 3 years ago and was pretty shocking at the time since I was plunged in a scientific environment where intense dialogue and exchange of ideas and research strategies between research groups are a “must” and I simply wasn’t prepared to have to interact continuously with so many other people around me.

I can now tell you that this open attitude and general cooperation among researchers, together with the outstanding science carried out in the Institute, is really what makes the difference. Whatever problem you may have, you’ll always find someone to help you and assist you, and to call up a smile when needed, which makes working at TIGEM extremely gratifying and pleasant.

The fact that TIGEM is a reference centre, renowned world-wide, for research on genetic diseases makes it also appealing for young scientists or PostDocs coming from abroad with the result that you are exposed to a multicultural environment and get to meet and interact with people coming from many different countries, cultures, religions, and races. TIGEM’s training activities (coursework, seminars and dataclubs) also help you in acquiring good ground knowledge of the genetic sciences as well as the listening and communicative skills that are necessary to present your work in a certain way and for a broad, general audience.

Many of my past colleagues at TIGEM are now working abroad and all undoubtedly have happy memories of TIGEM, and are somewhat nostalgic when they think back to the Institute’s retreats, the way we used to celebrate altogether an important publication (with food and sparkling wine!), and the public-awareness activities, such as the chorus rehearsals and theatre staging during the annual Telethon fund-raising marathon.

Sooner or later I will also have to leave but feel very lucky to have had the opportunity to work at TIGEM in such a lovely and happy place.
Anna D’Angelo  
Senior PostDoc  
Developmental Disorders Research Programme  
Year of enrollment: 2001 (PhD, OU graduate programme), 2008  

The first time I heard about TIGEM was at university during my undergraduate studies. I had always been told that TIGEM was an excellent place to do research so that when a call for a fellowship arrived at the university I didn’t hesitate an instant and immediately sent my application. I was worried and excited at the same time since I didn’t know what to expect from this experience yet was highly motivated to work at TIGEM for all the good things I had heard about the Institute and about its outstanding scientific environment. Hence, at the beginning of 2000 I started working at TIGEM as Research Fellow (since no PhD programmes were available at the time) and was enthusiastic when in 2001 several PhD programmes were implemented.

In particular, I was selected for the first PhD programme of the Open University (OU) organized at the Institute. The selection was very hard and I was extremely happy and excited to start a PhD, which would have been recognized abroad. The three years of my PhD were extremely challenging: constant supervision, intense coursework and weekly seminars and dataclubs to attend, semestral oral presentations and full-time doctoral research didn’t give me much time for anything else. At the time, I considered all these training and reviewing activities as a real “scientific bombardment” but now realize how that brainstorming was truly necessary to broaden one’s scientific and research perspective. I am really happy to have chosen to participate to the OU PhD programme also for other reasons. In searching for an adequate postdoctoral position, I realized during my interviews that the OU graduate programme is well known and appreciated all over Europe and in fact was accepted at the Pasteur Institute in Paris for three years as a PostDoc.

I have now returned to TIGEM where I am carrying out my second PostDoc since 2008 and my enthusiasm and spirit are the same as when I first started. The scientific brainstorming continues. The atmosphere is still highly dynamic. There is still a great spirit of collaboration in the Institute where all the researchers share their expertise.

A last point, but not the least, is that the average age at TIGEM is around 30-35 years old. The environment is young and the social life is very active. Soccer is the favorite sport for both girls and boys. Besides research, another common passion of “Tigemians” is the theatre. The nice aspect of our interest in drama is that the preparation of the rehearsals and performances, proposed in a proper public theatre, involve many staff members, from undergraduate students to principal investigators. And fun is ensured for all, both for the participants and the audience.

To date, I can say with no doubt that TIGEM is an excellent place to stay and to perform research. I am really convinced that it has greatly contributed to my scientific growth.

Diego Medina  
Senior PostDoc  
Inborn Errors of Metabolism Research Programme  
Year of enrollment: 2007  

My first thought, the minute my family and I decided to move to Naples (Italy), was to try and apply for a a post-doctoral position at TIGEM. My interest in TIGEM and in the work carried out here originated from a seminar I attended a couple of years before applying as a PostDoc, which was given by Prof. Andrea Ballabio, TIGEM’ Scientific Director, at the European Molecular Biology Laboratory (EMBL) Monterotondo where I spent 3 years as a Marie Curie PostDoc. With sheer contentment, my application was accepted and I have been working at TIGEM in Ballabio’s research group ever since then.

My high expectations of TIGEM and of the outstanding quality of its science have not been disillusioned. These three years as a PostDoc have been extremely interesting and challenging. In particular, this experience has given me the possibility to study the mechanisms of pathogenesis and disease progression in several models of Lysosomal Storage Disorders (LSDs), a varied group of diseases in which the fundamental biological process of cellular degradation and clearance, which is carried out in normal conditions by lysosomal enzymes, is profoundly reduced with extremely negative consequences on the organism. More in detail, my research at TIGEM has contributed to the discovery that autophagy plays an important role in the pathogenesis of LSDs as well as to the identification of a gene-network that transcriptionally controls the biogenesis and function of the lysosomal compartment.

Another important aspect to consider, that is not to be underestimated, is that TIGEM is part of a science and technology research complex, which also includes the Italian National Research Council (CNR) institutes of Genetics and Biophysics (IGB) and of Protein Biochemistry (IBP). Thus, there is plenty of offer of training courses, seminars and dataclubs organized by TIGEM as well as joined TIGEM-CNR seminar series.

Finally, TIGEM’s friendly working environment as well as the Institute’s state-of-the-art technical core facilities make the difference in speeding up research, and moving more efficiently from data analysis to publication.
Naples for Research

Naples hosts the largest concentration of academic and research institutes in Southern Italy.

The Campania region (of which Naples is the chief city) supports nine Universities (Università degli Studi di Napoli Federico II, Seconda Università degli Studi di Napoli, Università degli Studi di Napoli Parthenope, Università degli Studi di Napoli L’Orientale, Università degli Studi Suor Orsola Benincasa, Università degli Studi di Salerno, Università degli Studi del Sannio, Università Telematica Gaetano Fortunato, Università Telematica Pegaso) and a number of research centres whose interests stretch across various disciplines: agriculture and food, ecology, life sciences and medicine, biotechnology, socio-economic sciences, to cite some. Eighteen (38%) of the 31 institutes distributed in the South and belonging to the Italian National Research Council (CNR) are in Campania (7 in Naples, 1 in Avellino). Of these, seven are devoted to life sciences and molecular design and include the IRB and IGP that, together with TIGEM, share the same research complex (see also TIGEM: General Organization). Other than the CNR’s Institutes, other important research organizations, whose mission is in the biological sciences, are the Stazione Zoologica, Anton Dohrn, Napoli (that includes the oldest Aquarium in Europe) and several institutional consortia (e.g. BIOGEM and CEINGE).

The large number of institutes in the Campania region favours contacts between organizations working in similar research fields but also collaborations between the Universities and public and private research institutions. In particular, TIGEM’s close proximity to the IRB and IGP has stimulated collaborations. The TIGEM and IRB seminar series are organized on the spot, encouraging scientists and students of both institutes to participate and thus favouring an inter-change of ideas and interests. TIGEM also counts a long-standing collaboration with the Department of Pediatrics from the Università degli Studi di Napoli Federico II and has recently established collaboration with the Department of Ophthalmology of the Seconda Università degli Studi di Napoli. Finally, an outpatient clinic for pediatric patients with inherited ocular diseases is now made possible, by a combined strength of TIGEM and Università degli Studi di Napoli. Finally, a clinic for pediatric patients with inherited ocular diseases is now made possible, by a combined strength of TIGEM and Università degli Studi di Napoli.

Students might also be unaware of the fact that five sites included in the World Heritage List (out of 44 for Italy) are found in Naples and the Campania region and are, namely: 1) The historical centre of Naples, 2) The 18th century royal palace and park at Caserta (including the Aqueduct of Vanvitelli and the S. Leucio complex), 3) The archaeological areas of Pompei, Herculanenum, and Torre Annunziata, 4) The Amalfi coast, and 5) The archaeological sites of Paestum and Velia and the Padula Charterhouse (Certosa di Padula).

Other than for its rich history, art and culture, Naples is also well known for its vibrant nightlife and exquisite cuisine. Live music is often played in many clubs and “piano bars” throughout the picturesque alleyways of the historical centre. The city also offers a vast selection of restaurants and pubs where one can spend a pleasant evening at the end of a hard day’s work. The delicious “Pizza Margherita” (pizza with tomatoes and mozzarella cheese) and “Risotto alla pescatore” (risotto with clams and black mussels, see photograph) are a must for the average outsider!

And for a bit of fresh air, hop on a hydrofoil or ferry and visit the islands of Procida, Ischia or Capri, experience a weekend in Sorrento and the Amalfi coast or a trek up Mount Vesuvius.

All will leave a permanent trace in your memory.

ruins, or the breathtaking view from Tiberius’ villa on the island of Capri. Traces of the successive dominations (Byzantines, Lombards, Aragonese, Spaniards, Austrians, Bourbons, to cite but a few) following the Roman Empire can be seen in the city’s numerous castles, palaces, museums and churches but also in the cultural heritage that characterizes Neapolitans.
Probationary Period Report (OU students only): It must be submitted at the end of the first year (11 months after matriculation) and substitutes (and is equivalent of) the PhD Thesis Proposal. According to The OU rules, the “Probationary Period Report should involve a major review of the student’s progress so that a recommendation can be made about which degree s/he is to be registered for, i.e. PhD or MPhil”. Students and supervisors will be informed by the Research School in due time of the deadline as well as being provided with the appropriate forms for probationary period report submission.

Research School: is intended as the university of enrollment (i.e. The Open University, the Università degli Studi di Napoli Federico II, the Seconda Università degli Studi di Napoli, etc.) and is therefore the awarding body that confers the student with the final PhD title.

SEMM PhD programme: The graduate programme in molecular medicine, which is based on an official agreement between the European School of Molecular Medicine (SEMM), a private foundation founded also by TIGEM (among others), and the Università degli Studi di Napoli Federico II (Naples, Italy), which acts as Research School and awarding body.

SEMM students: Students belonging to the SEMM PhD programme.

Skills audit: A benchmark assessment of the student's research skills in the categories specified at the beginning and by the end of the graduate studies and that should be expected of someone who has obtained a PhD.

Sponsoring establishment: is intended as the Institute (i.e. TIGEM) that hosts the students recruited in the graduate programmes, providing them with laboratory space, facilities, resources, and educational activities.

SUN PhD programme: The graduate programme in medical genetics, which is based on an official agreement between TIGEM, as sponsoring establishment, and the General Pathology Dept of the Seconda Università degli Studi di Napoli (SUN, Naples, Italy), as Graduate School in Biomedicine and awarding body.

SUN students: Students belonging to the SUN PhD programme.

Supervisor (or Tutor): A faculty or research member of the sponsoring establishment (or Research School) who assists the student, as an additional reference person to the supervisor, in his/her training activities, guides the student's choices, and in following the student's doctoral research progress throughout his/her graduate studies.

ECTS: The European Credit Transfer and Accumulation System (ECTS), which is defined as “a standard for comparing the study attainment and performance of students of higher education across the European Union and other cooperating European countries”.

ePortfolio: A block of disk storage that can be used to keep records of the skills achievements. As the student acquires skills, s/he should upload records of those achievements into the ePortfolio. At regular periods (every 6 months), the student’s supervisor will view the contents of this ePortfolio and check that the appropriate evidence is there.

External supervisor: A faculty or research member belonging to a foreign scientific institution or research centre having previous experience in student supervision in the British academy (compulsory for OU students), with whom the student meets once a year to monitor the progress in thesis work, and to discuss future strategies and individual problems with the on-site Thesis Committee.

OU PhD programme: The graduate programme in human genetics, which is based on an official agreement between TIGEM, as sponsoring establishment, and The Open University (OU, Milton Keynes, UK), as Research School and awarding body.

OU students: Students belonging to the OU PhD programme.

Personal Progress Log: or simply logbook, which students receive, soon after matriculation and which summarizes the main training and reviewing activities (courses, seminars, data clubs, annual meetings) students must undergo for each year of their graduate studies.

PhD Thesis Proposal: It must be submitted during the last trimester of the first year and is composed of the following sections: Title; Abstract of research, Specific aims, Background, Preliminary data (if available; not a requirement), Methods, References. The total length of the proposal including refs should not exceed 10 pages. The proposal should thus introduce the topic under study and working research hypothesis, outlining the experiments to be accomplished during a three-year period. Students are expected to present their proposal for research also as an oral presentation and both are evaluated by the Thesis Committee. The student may also be asked to rewrite the proposal or even to resign, should s/he not satisfy the minimal requirements as evaluated by the commission. After the requirements of the thesis proposal and oral presentation are satisfied, students focus on the research project proposed.
Contacts

Telethon Institute of Genetics and Medicine (TIGEM)
Via P. Castellino 111
80131 - Naples, Italy
Phone: +39 081-6132200
Fax: +39 081-5698577
www.tigem.it

TIGEM Scientific Director: Andrea Ballabio, MD

Graduate programme Dean: Graciana Diez Roux, PhD

Graduate programme Coordinators: OU: Sandro Barfi, MD
SEMM: Diego di Bernardo, PhD
UNINA: Sergio Cocozza, MD
SUN: Vincenzo Nigro, MD

OU and SEMM Students administrator:
Barbara Zimbardi
Phone: +39 081-6132208
Fax: +39 081-6132351
zimbardi@tigem.it

UNINA & SUN Students administrator:
Brunella Summaria
Phone: +39 081-6132204
Fax: +39 081-6132351
summaria@tigem.it

The TIGEM Students Handbook Team:
Graciana Diez Roux - Project Supervision
Luciana Bornelli - Editing, Layout & Design
Section of the murine cerebral cortex in which two different markers of neural development (Rnd2 in blue, Tbr2 in brown) are visible by immunohistochemistry and in situ hybridization.

Photograph by: Christian Alfano
PostDoc (Dr Studer group)
Come and join us at TIGEM!