

# NANOSCIENCE FOR MEDICINE AND THE ENVIRONMENT

Section "Positions and scholarships" integrated on 30/04/2020

Section "Positions and scholarships" integrated on 28/05/2020

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<b>Starting date of the PhD Programme</b>	01/11/2020
<b>Duration</b>	3 calendar years
<b>Language of the PhD Programme</b>	English
<b>Mandatory stay abroad</b>	Yes (3 months)

## Research topics

The PhD in "Nanoscience for Medicine and the Environment" supports research projects dealing with the relation between Nanoscience and Health, considering both "human health and environmental health".

Two different thematic areas are planned:

### Nanoscience for Medicine

- Interactions between nanostructures and biomolecules/cellular structures
- Drug delivery systems
- Nanostructures, solid pharmaceutical hybrids formulations, crystalline polymorphism of active pharmaceutical ingredients
- Nanostructures and nanoformulations for high bioavailability administration of nutrients and bioactive molecules
- Use of artificial molecular machines in biomimetic systems
- Development of theranostic nanoplatfoms
- Design of nanostructured materials for the development of (multimodal) imaging contrast agent
- Nanostructured organic semiconductors for sensor applications
- Nanobiosensing for "point-of-care" and personalized medicine
- Nanotechnology in nutrition
- Nanostructures for regenerative medicine
- Cellular nanoengineering
- Nanotoxicology and technologies for "safety by design"

### Nanoscience for the Environment

- Photo and/or electrocatalysts for water and air remediation or for the production of energy using "solar fuels"
- Nanobiosensing for environmental monitoring
- Nanostructured photo and/or electrocatalysts for the reduction of CO<sub>2</sub> in high energy density products
- Development of innovative synthesis for the production of nanocatalysts active in the sustainable transformation of biomass into chemicals
- Nanostructured platforms for the development of membranes for "water remediation"
- New materials for the conversion and storage of solar energy using molecular machines
- Nanoecotoxicology
- Life cycle analysis (LCA) of the production and use of nanomaterials

## PhD positions and scholarships

Position n.	Financial support	Description	Positions linked to research subjects
1	PhD Scholarship	Totally funded by the University of Bologna general budget	
2	PhD Scholarship	Totally funded by the University of Bologna general budget	
3	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Industrial Chemistry "Toso Montanari" and by the Department of Physics and Astronomy with funds made available by the PON 2014/2020 "TEX-STYLE Innovative smart textiles for new creative design and made in Italy style (ARS01_00996) (Prof. Beatrice Fraboni)	

4	PhD Scholarship	Funded by the Department of Chemistry "G. Ciamician" with funds made available by the project PRIN 20179BJNA2_002 for €10.631,00 (Prof.ssa Chiara Gualandi) and by the Department of Specialty, Diagnostic and Experimental Medicine	Functional polymers for self-diagnostic materials
5	PhD Scholarship	Funded by MIUR under the "Departments of Excellence" initiative	Nanoscience for medical, environmental/energetic applications
6	PhD Scholarship	Funded by MIUR under the "Departments of Excellence" initiative	Nanoscience for medical, environmental/energetic applications
7	Research Grant	Provided by the Department of Chemistry "G. Ciamician". The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19.367.	Conjugation and characterization of engineered M13 phages-nanoparticles for photodynamic, sonodynamic and photothermal cancer therapy
8	Research Grant	Provided by Consiglio Nazionale delle Ricerche - Istituto per la Sintesi Organica e la Fotoreattività (CNR-ISOF). The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19.367.	Polysulfone-graphene oxide hollow fibers for specific filtration processes for water and indoor air purification
9	Research Grant	Provided by Consiglio Nazionale delle Ricerche - Istituto per la Sintesi Organica e la Fotoreattività (CNR-ISOF). The research grant will have a duration of 12 months, renewable up to 36 months, and a gross percipient amount of € 19.367.	Graphene oxide based membranes and related filters for drinking water purification

**Positions linked to specific research subjects:** during the oral test, applicants may express their interest in one or more positions linked to specific research subjects. Considering the expressions of interest above, the Admission Board shall express its view on the suitability of the interested applicants, taking into account their specific skills, experience and aptitude.

#### Admission requirements

Please, see art. 2 of the Call for applications

#### Mandatory documents to be attached to the application

Please, see art. 3 of the Call for applications

**Further qualifications that may be attached to the application, if in possession of the applicant** (only qualifications attested by documents drawn up in Italian, English, French, German and Spanish shall be considered as valid and assessed by the Admission Board)

- Abstract of the second cycle master's degree thesis. Undergraduate applicants may submit the draft of the thesis approved by their supervisor (please, note that abstracts cannot exceed 5.000 characters, including spaces and formula possibly used. The above figure does not include: the title of thesis, the outline, and images such as graphs, diagrams, tables etc. - where present)
- Motivational letter. This must include the reasons prompting the applicant to attend the PhD Programme and those relevant experiences and research interests that make the applicant suitable for the specific PhD Programme (3000 characters maximum, including spaces).
- Publications *in extenso* (monographs, articles published on scientific journals, book's chapters) - max n. 2
- Abstracts and posters presented during national and international conferences, etc.) - max n. 2
- Study periods completed by students outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes).
- Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc).

#### Admission exams (art. 4 of the call for applications)

<b>Examination type</b>	<b>Schedule</b> (please, note that applicants shall not receive any communication concerning the exams schedule)	<b>Examination results publication</b> (please, note that applicants shall not receive any communication concerning the publication of results)
<b>Qualifications evaluation</b>	Non-presential.	The results of the evaluation of qualifications shall be available online starting from the <b>12/06/2020</b> at the page <a href="http://studenti.unibo.it">http://studenti.unibo.it</a> (please, select "summary of the requests in progress" - "see detail" and open the pdf file "risultati valutazione titoli")

<b>Oral examination</b>	<b>Date</b>	<b>18/06/2020</b> In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral exam schedule shall be made available at the webpage <a href="http://studenti.unibo.it">http://studenti.unibo.it</a> together with the results of the evaluation of qualifications	The results of the oral examination shall be available on the webpage <a href="http://studenti.unibo.it">http://studenti.unibo.it</a> starting from <b>26/06/2020</b> (please, select “summary of the requests in progress” - “see detail” and open the pdf file “risultati prova orale”)
	<b>Time</b>	9:00 a.m.(local time)	
Applicants shall take the exam remotely. For further details please refer to the relevant provision laid down in art. 4 of the Call for applications.			

**Evaluation criteria**

Points will be allocated to applications out of a total of 100 on the basis of the following weighting:

**1. Qualifications**

- Minimum for admission to the oral exam: 30 points
- Maximum: 50 points

Only qualifications relating to the last 5 calendar years prior to the calendar year of publication of the Call for applications shall be taken into consideration, with the exception of the University Degree (Diploma di laurea). Please, note that qualifications must be consistent with the PhD Programme.

Points relating to qualifications shall be allocated on the basis of the following criteria:

- Graduation final mark. Undergraduates shall be evaluated on the basis of the Weighted Average Mark (WAM): max 10 points
- Coherence between the master’s degree thesis and the topics covered by the PhD programme: max 12 points
- Motivation letter: max 20 points
- Publications: max 2 points
- Other qualifications: max 6 points

**2. Oral examination**

- Minimum for inclusion in the final ranking list: 30 points
- Maximum: 50 points

Oral examination is intended to assess the suitability of the applicant in respect of the pursuing of scientific research as well as the general knowledge of issues connected to the PhD Programme

The oral examination is carried out in English.

Points relating to the oral examination shall be allocated on the basis of the following criteria:

- knowledge of the English language: max 5 points
- general knowledge of issues connected to the PhD Programme: max 45 points

Possible evaluation sub-criteria will be available on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.

**Final ranking list and enrolment (arts.6 and 7 of the call for applications)**

After the publication of the results of the oral exam, the final ranking list will be available on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information” at the bottom of the page in the section “Notices”.

Following the publication of the final ranking list, successful applicants must enrol on <http://studenti.unibo.it> by the deadline indicated on the [Unibo website](#), selecting the relevant PhD Programme → “PhD programme information”.