

PhD Programme table 37th cycle – PON Call for application “Ricerca e Innovazione” 2014 – 2020



UNIONE EUROPEA
Fondo Sociale Europeo



Errata corrige section “Evaluation criteria” – modified on 19/10/2021

PROGRAMME’S NAME	NANOSCIENCE FOR MEDICINE AND THE ENVIRONMENT
DURATION	3 years
PROGRAMME START DATE	01/01/2022
LANGUAGE	English
COORDINATOR	Prof. Dario Braga (dario.braga@unibo.it)
CURRICULA	N/A
RESEARCH TOPICS	Detailed list at the bottom of the present document
PHD POSITIONS	3
ADMISSION PROCEDURE	Qualifications and research proposal evaluation

Available Positions and Scholarships

Actions	Pos. n.	Financial Support	Research topic
Action IV.5 “PhDs on green topics”	1	PhD Scholarship	Sensors for monitoring water quality
	2	PhD Scholarship	Development of biosensors for rapid and low-cost analysis of industrial by-products and wastewater in agreement with circular economy principles
	3	PhD Scholarship	Five-membered heteroligand – ruthenium (N,O) chelate systems: chemistry and bioactivity

Required and Supporting Documents to be attached to the application

(only documents in Italian, English, French, German and Spanish shall be considered as valid and be assessed by the Admission Board)

Only qualifications obtained during the last 5 calendar years shall be taken into consideration, except for the University Degree. **The Admission Board will assess the relevance of the supporting documents to the criteria listed in Art. 3 of the Ministerial Decree 1061/2021 (see also Art. 4 of the Call for applications).**

REQUIRED DOCUMENTS	
Identity document	Valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae	No specific CV format is required
Degrees	Documents attesting the awarding of the first and second cycle degrees (see Art. 3 of the Call for Applications)
Research proposal	Multi-annual research proposal, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements: <ul style="list-style-type: none"> - it cannot exceed 20,000 characters, including spaces and formulas, if present. This figure does not include: the title, the outline, references and images (such as graphs, diagrams, tables etc. - where present);

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	- it must be written following the template provided for Action IV.5 “PhDs on Green topics”. The template is attached to the Call for Application and available for download on the University website.
SUPPORTING DOCUMENTS	
Publications	Lists of publications (i.e. monographs, articles on scientific journals), minor publications (conference papers, etc.), abstracts and posters presented during national and international conferences, etc.

Evaluation criteria

The **results of the admission exams** will be **available from 03/11/2021** on [Studenti Online](#) (select “summary of the requests in progress” > “see detail” and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants concerning the examinations results.**

Scores will be expressed in points out of 100, as follows.

Minimum score for eligibility: 60 points, Maximum score: 100 points

Qualifications evaluation	University degree final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM)	10 points max: - 10 points for 110 e Lode - 8 points for 110 and 109 - 6 points for 105 to 108 included, - 4 punti for 101 to 104 included - 3 punti for 95 to 100 included
	Publications	10 points max: - 3 points for publications on ISI/Scopus or Class A journals - Up to 1 point for publications in conference procedures, participation to conferences and other academic publications
Research proposal evaluation	Scientific value and innovative nature of the proposal	20 points max
	Potential of the research project in fostering exchanges between research and business	20 points max
	Individuation of parameters which allow measuring the project’s progress	20 points max
	Adherence of the research goals to the objectives of the PNR 2021-2027	20 points max

Research Topics

n. 1 - GREEN

Thematic area SNSI 2014-20	Smart and sustainable industry, energy and environment <i>Development trajectories:</i> 1. Water and waste treatment systems and technologies
PNR 2021-2027*	Food, Bioeconomy, Natural Resources, Agriculture, Environment Section: Prevention of soil and water contamination and Observational tools for the knowledge of the marine and coastal ecosystem
Project title	Sensors for monitoring water quality
Project description	The project is focused on the development, thanks to appropriate nanomaterials, of sensors dedicated to monitoring the quality of water, with particular attention to new classes of pollutants, such as micro- and nano-plastics and the so-called Emerging Pollutants (including pharmaceutical products) that – once dispersed in water – can lead to chronic toxicity, endocrine disorders and the development of drug resistance. Biosensors will also be developed for biological monitoring of the waters themselves.
Mandatory traineeship	6 months

Company type	Manufacturer of diagnostic kits for analysis; genetic and biomarker analysis
Stay abroad	6 months

n. 2 - GREEN

Thematic area SNSI 2014-20	Smart and sustainable industry, energy and environment <i>Development trajectories:</i> 1. Innovative, highly efficient production processes for industrial sustainability 2. Water and waste treatment systems and technologies
PNR 2021-2027*	6.Food, Bioeconomy, Natural Resources, Agriculture, Environment Section 6. Emerging trends in food technologies and efficiency of transformation processes Research priority 6.f: Reduction and valorisation of by-products.
Project title	Development of biosensors for rapid and low-cost analysis of industrial by-products and wastewater in agreement with circular economy principles
Project description	The project involves the development of bio-nanosensors for the analysis of the bioactivity and safety of by-products of the agri-food industry and for water analysis aimed at reuse of treated waste-water. The PhD program will train a person capable of identifying innovative circular economy processes aimed at the valorisation of waste and the recovery of wastewater in synergy with the local companies. The sensors will in fact be designed to be used also by small and medium-sized enterprises.
Mandatory traineeship	6 months
Company type	Agri-food industry or sector of water analysis and treatment
Stay abroad	6 months

n. 3 - GREEN

Thematic area SNSI 2014-20	Health, nutrition, quality of life <i>Development trajectories:</i> 1. Biotechnology, bioinformatics and pharmaceutical development
PNR 2021-2027*	Health Section 3: Implementation of Diagnosis, Therapy, Follow-up systems for non-communicable and/or age-related diseases Section 4: Neurosciences and Mental Health
Project title	Five-membered heteroligand – ruthenium (N,O) chelate systems: chemistry and bioactivity
Project description	Coordination of carboxy-heterocycles (thymine, pyrazine) to Ru(H)2(CO)(PPh3)3 selectively and sustainably selectively affords by exclusive release of H2 chelate Ru(II)-species with potential therapeutic bioactivity. Structure-Reactivity features will be exploited by studying: -coordination of one/ two ligands as 2-/3- carboxy pyrrole, L-hydroxy stearic acid (9-/12-HSA), amino-phenols, amino acids (asparagine), hydroxytryptophan (4L/5L-HTP), polydentate immunostimulators; -dynamic aspects (NMR and DFT); - supramolecular interactions (X-ray); -biotests
Mandatory traineeship	6 months
Company type	Global drug research and development company, operating through external alliances with pharmaceutical and biotechnology companies
Stay abroad	6 months

*The translation of the PNR 2021-2027 references has been carried out by the PhD Unit