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

PROGRAMME'S NAME	CELLULAR AND MOLECULAR BIOLOGY
DURATION	3 years
PROGRAMME START DATE	01/01/2022
LANGUAGE	Italian, English
COORDINATOR	Prof. Vincenzo Scarlato (vincenzo.scarlato@unibo.it)
CURRICULA	N/A
RESEARCH TOPICS	Detailed list at the bottom of the present document
PhD POSITIONS	4
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	Natural and modified bacteriophages in the sustainable control of porcine post-weaning diarrhea.
	2	PhD Scholarship	Valorization of wastewater for the production of natural products through the use of microalgae and cyanobacterial systems
	3	PhD Scholarship	Molecular, genomic and functional study of the interaction between microorganisms and biochar for the industrial sustainability
	4	PhD Scholarship	Use of bioenergetically active membranes for the study of environmental friendly solvents.

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)
Degrees	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
Curriculum Vitae	No specific CV format is required
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:

	- 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); - 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, volume's chapters 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 and Lode - 8 points for 109 to 110 included - 6 points for 105 to 108 included - 4 points for 101 to 104 included - 3 points for 95 to 100 included
	Publications	10 points max. Only titles within the PhD Programme's research topics will be evaluated: - 4 points for any major publication on scientific journals, - Up to 2 points for any minor publication, conference poster or other publications
Research proposal evaluation	Scientific value and innovative nature of the proposal	20 points max.
	Ability of the project to foster the synergy between research and the productive world	5 points max.
	Description and structure of the proposal	45 points max.
	Identification of parameters allowing the measurability of expected results	5 points max.
	Adherence of the proposal to the objectives of the Action PON R&I 2014-21	5 points max.

Research Topics

n. 1 - GREEN

Thematic area SNSI 2014-20	**Thematic Area: *Health, nutrition, quality of life*** Development Trajectory: Development of precision agriculture and agriculture of the future
PNR 2021-2027*	**Research Field: Food, bioeconomy, natural resources, agriculture, environment** Area of Application: *Knowledge and sustainable management of agricultural and forestry systems* Sections: 4. Agricultural and forestry activities to protect the environment and natural resources. 5. Agricultural and forestry systems with high environmental quality.
Project title	**Natural and modified bacteriophages in the sustainable control of porcine post-weaning diarrhea**.
Project description	Post-weaning diarrhea of piglets, caused by the proliferation of enteric pathogenic bacteria, is contrasted with a wide use of antibiotics or high dose of minerals like ZnO. These treatments have enormous repercussions on the environmental and social sustainability of the pig sector, reason for which the European Community promotes the search for alternatives. The project aims to explore the potential of natural and engineered bacteriophages as dietary supplements in the treatment and prevention of post-weaning diarrhea, and to investigate their applicability in the European regulatory context.
Mandatory traineeship	6 months
Company type	Marketing of supplements for the animal, food, cosmetic and pharmaceutical industries.
Stay abroad	NO

n. 2 - GREEN

Thematic area SNSI 2014-20	**Thematic Area: *Smart and sustainable industry, energy and environment*** Development Trajectories: - Water and waste treatment systems and technologies; - Technologies for biomaterials, biobased products and biorefineries
PNR 2021-2027*	**Research Field: Food, bioeconomy, natural resources, agriculture, environment**
Project title	**Valorization of wastewater for the production of natural products through the use of microalgae and cyanobacterial systems**
Project description	Mixotrophic growth of microalgae and cyanobacteria on dairy wastewater. The fixation of CO2 combined with the absorption of nutrients from the wastewater allows the production of new biomass as well as the remediation of wastewater. The biomass will be valorized as such (eg. Spirulina as a food supplement) or for the extraction of high-value compounds, such as pigments (phycobiliproteins), antioxidants (astaxanthin) and polyhydroxyalkanoates for bioplastics.
Mandatory traineeship	6 months
Company type	Food sector
Stay abroad	NO

n. 3 - GREEN

Thematic area SNSI 2014-20	**Thematic Area: *Smart and sustainable industry, energy and environment*** Development Trajectories: - Water and waste treatment systems and technologies; - Technologies for biomaterials, biobased products and biorefineries
PNR 2021-2027*	**Research Field: Food, bioeconomy, natural resources, agriculture, environment** Area of Application: Bioindustry for the BioEconomy
Project title	**Molecular, genomic and functional study of the interaction between microorganisms and biochar for the industrial sustainability**

Project description	Biochar is a charcoal generated from waste biomass with a porous structure suitable for microbial colonization. Microbial adhesion on biochar strongly contributes to its filtering capacity in the framework of environmental remediation and carbon sequestration. The objectives of the project concern the study of colonization and microbial adhesion (biofilm) on biochar and the influence that this adhesion has on the microbial metabolism involved in bioremediation, bioconversion and biorecovery processes
Mandatory traineeship	6 Mesi
Company name or type	Green sector
Stay abroad	NO

n. 4 - GREEN

Thematic area SNSI 2014-20	**Thematic Area: *Smart and sustainable industry, energy and environment*** Development Trajectory: Innovative and environmentally friendly materials
PNR 2021-2027*	**Research Field: Food, bioeconomy, natural resources, agriculture, environment**
Project title	**Use of bioenergetically active membranes for the study of environmentally friendly solvents**
Project description	The use of environmentally friendly substances is the primary objective of green chemistry. Among these, solvents (ionic liquids, eutectic solvents), environmentally friendly surfactants and biobased chemicals play a central role. The interaction with biological entities and their environmental impact vary greatly. The effects of green substances on the integrity of native biological membranes isolated from photosynthetic bacteria and mitochondria, and their toxicity on model cells and microorganisms will be studied.
Mandatory traineeship	6 months
Company type	Green chemistry sector
Stay abroad	NO

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