

PHD COURSE IN SCIENCE AND TECHNOLOGY FOR THE ENVIRONMENT AND HEALTH (STAS) Coordinator: Professor Marina Paolucci, paolucci@unisannio.it	
ADMINISTRATIVE HEADQUARTERS	Department of Science and Technology
DURATION	Triennial
Addresses	1). Applications for the Environment; 2). Health Applications.

PLACES IN COMPETITION (19 - nineteen)

Position with scholarship funded by Public Notice Campania Region: "INNOVATIVE RESEARCH DOCTORATES WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027- PRIORITY 2 EDUCATION AND TRAINING – SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2.G.4. - D.D. N.100 OF 30.05.2025	"Study of the mechanisms regulating blood-brain barrier integrity in inflammatory conditions". "The blood-brain barrier (BBB) is essential for maintaining cerebral function and regulating the transport of molecules from blood to the brain. However, inflammatory conditions, such as those associated with neurodegenerative diseases, can alter its integrity and function. The research project aims to investigate the molecular and cellular mechanisms that regulate BBB permeability under conditions of neuroinflammation. Through the development of in vitro and in vivo experimental models, the cellular interactions in different pathophysiological contexts will be evaluated to identify neuroprotective strategies. In addition, microscopy techniques and computational methods will be used". The research project includes a 9 month- period of international mobility in a foreign laboratory and a 6 month-period in a company.	1 position	To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/
Position with scholarship funded by Public Notice Campania Region: "INNOVATIVE RESEARCH DOCTORATES WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027- PRIORITY 2 EDUCATION AND TRAINING – SPECIFIC OBJECTIVE ESO 4.7 - ACTION	"INTEGRA: Integration of antimicrobial peptides and small molecules into innovative polymeric gels for highly effective local therapies". The project aims to develop innovative drug delivery systems for the encapsulation and controlled release of complex antimicrobial peptides (AMPs) and small molecules of natural and synthetic origin with antimicrobial and antitumor activities. The main goal is to enhance the stability, bioavailability, and therapeutic efficacy of these lead compounds, enabling targeted and controlled delivery to infected or neoplastic tissues while minimizing bacterial resistance and systemic side effects. Research activities will include the rational design of biocompatible formulations	1 position	To participate in this type of position, it is

2.G.4. - D.D. N.100 OF 30.05.2025	for the loading of selected leads and in vitro biological evaluation on eukaryotic and bacterial cell models, with particular focus on tumors of microbial etiology. The most promising compounds will be further investigated through preclinical validation in collaboration with specialized research centers. This interdisciplinary project integrates expertise in chemistry, biotechnology, and pharmaceutical sciences, aiming to develop multifunctional therapeutic platforms capable of combining antibacterial and antitumor activities within a single targeted nanomedicine strategy.		mandatory to carry out periods of study and research abroad and in companies https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/ .
Position with scholarship funded by Public Notice Campania Region: "INNOVATIVE RESEARCH DOCTORATES WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027- PRIORITY 2 EDUCATION AND TRAINING – SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2.G.4. - D.D. N.100 OF 30.05.2025	<p>“BIOPOST-EVO – Postbiotic Metabolic Blends from Agri-Food Waste for Functional EVO Oil: Sustainable Extraction, Biobased Upcycling, and Nutraceutical and Immunomodulatory Applications”.</p> <p>The project aims to valorize waste from the olive oil supply chain through the design and development of innovative, biobased biotechnological processes for the production of postbiotic metabolic blends from olive leaves, for the functional enrichment of extra virgin olive oil, a symbolic product of the Mediterranean and the Campania region. The project aims to generate new nutraceutical solutions and functional foods to benefit human health, with particular emphasis on disease prevention and immune system enhancement, from a perspective of circular bioeconomy, environmental sustainability, and dual supply chain innovation: on the one hand, creating a new, high-value functional ingredient from an agricultural byproduct; on the other, applying this ingredient to enhance the quality and shelf life of extra virgin olive oil.</p>	1 position	To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/ .
Position with scholarship funded by Public Notice Campania Region: "INNOVATIVE RESEARCH DOCTORATES WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027- PRIORITY 2 EDUCATION AND TRAINING – SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2.G.4. - D.D. N.100 OF 30.05.2025	<p>“New formulations of biobased tanning substances with reduced environmental impact for the tanning industry”.</p> <p>The PhD project aims to develop new classes of tanning agents, biobased where possible.</p> <p>The research project has a twofold objective: on the one hand, it aims to overcome the environmental issues associated with the use of Cr(III) salts in tanning processes, and on the other, it aims to develop tanning materials that are more efficient and environmentally friendly than synthetic tannins.</p> <p>Specifically, the new tanning agents will be obtained through the appropriate chemical functionalization of various natural biopolymers, such as chitosan, keratin, tannins extracted from carob fruit, or functionalized cellulose.</p> <p>The finished products obtained from these modified materials will be used in application tests as is or, where necessary to optimize their performance, in blends with commercially available synthetic and/or natural tannins.</p>	1 position	To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/ .

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<p>Position with scholarship funded by Public Notice Campania Region: "INNOVATIVE PHDS WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027 - PRIORITY 2 EDUCATION AND TRAINING - SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2. G.4. - D.D. N.100 OF 30.05.2025</p>	<p>"Design of chimeric receptors for the modulation of macrophage response".</p> <p>This project falls within the "Biotechnologies and Human Health" specialization area of RIS3 Campania and focuses on the development of innovative immunotherapeutic strategies for solid tumors resistant to current treatments. Its goal is to generate chimeric antigen receptor-engineered macrophages (CAR-M) capable of selectively recognizing tumor antigens, reshaping the tumor microenvironment, and promoting a potent and durable antitumor immune response.</p> <p>The research strategy combines computational identification of novel intracellular domains, design and characterization of new chimeric receptors, and genetic modification of monocytes to induce their differentiation into functional macrophages expressing the engineered receptors. Functional in vitro studies will evaluate their cytotoxic and immunomodulatory activities.</p> <p>With a strong potential for industrial translation, the project supports the standardization of receptor production and integration into next-generation engineered cell therapy platforms, contributing to the advancement of patentable, high-value biotechnological innovations in precision oncology.</p>	<p>1 position</p>	<p>To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies</p> <p>https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/</p>
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	<p>aim to control symptoms; however, a significant percentage of patients either do not respond well to treatment or experience a loss of efficacy over time. SCFAs are of particular interest due to their protective properties towards the intestinal barrier. They act as a sort of 'molecular shield', protecting the barrier from inflammatory stimuli and significantly reducing the expression and release of IL-1β, thereby strengthening the epithelial barrier. Using intestinal organoids as a model for studying IBD not only allows for increasingly tailored therapy for individual patients, but also offers numerous other possibilities. Primarily, it enables a more accurate study of the complex interactions between the different cells that make up the intestinal epithelium. It also allows for increasingly detailed assessments, which are particularly useful for evaluating the toxicity of drugs and chemicals, as well as studying their absorption and metabolism in the intestine. Furthermore, the proposed research makes use of well-characterised, highly reproducible and physiologically relevant cell models, which guarantee the reliability of SCFA efficacy assessments in chronic inflammatory diseases”.</p>		<i>di-ricerca-innovativi-con-caratterizzazione-industriale/</i>
<p>Position with scholarship funded by Public Notice Campania Region:</p> <p>"INNOVATIVE PHDS WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027 - PRIORITY 2 EDUCATION AND TRAINING - SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2. G.4. - D.D. N.100 OF 30.05.2025</p> <p>(the scholarship will be activated subject to authorization for funding by the Campania Region)</p>	<p>INFLA-MEAT: “Studying the relationship between intestinal and muscle health for improving meat quality and animal welfare in pigs”.</p> <p>“INFLA-MEAT is a research project aimed at deepening knowledge on the relationship between the gut and skeletal muscle in pigs. The research outcomes may help improve animal welfare and pork meat quality by identifying intestinal inflammatory biomarkers and muscle biomarkers. It is well known that chronic intestinal inflammation in pigs, often associated with dysbiosis and nutritional stress, negatively affects muscle physiology and meat quality traits; understanding this relationship is crucial for optimizing productivity and product quality.</p> <p>The project adopts a multidisciplinary and biotechnological approach, combining molecular biology, proteomics, and functional nutrition based on the use of natural bioactive molecules derived from agri-food by-products.</p> <p>In line with the RIS3 Campania strategy, the project integrates the One Health paradigm and precision livestock farming, promoting the reduction of antibiotic use and the concept of circular economy. Expected outcomes include the development of rapid diagnostic kits, patentable functional feeds, and predictive models for meat quality. INFLA-MEAT strengthens the synergy between research and industry, fostering technological innovation and sustainability, while facilitating the integration of young researchers into the agri-food system”.</p>	1 position	<p>To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies</p> <p>https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/.</p>
<p>Position with scholarship funded by Public Notice Campania Region:</p> <p>"INNOVATIVE PHDS WITH INDUSTRIAL</p>	<p>“Remote and proximal sensing for multi-scale monitoring of environmental parameters in risk-affected areas”.</p> <p>“This project is based on a multidisciplinary approach involving geology, geophysics, proximal and remote sensing of environment and data science. The main target will be the</p>	1 position	

<p>CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027 - PRIORITY 2 EDUCATION AND TRAINING - SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2. G.4. - D.D. N.100 OF 30.05.2025</p> <p>(the scholarship will be activated subject to authorization for funding by the Campania Region)</p>	<p>development of operational strategies of environmental parameters monitoring, robust and flexible as requested to manage different kind of risks, at various space and time scales of observation. The project aims at shaping an expert able to: i) understand and manage different techniques; ii) support the conceptualization of new methods of data-fusion and multi-stage processes; iii) promote the technology transfer to Institutions and local administration responsible for environmental manage and protection".</p>		<p>To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies</p> <p>https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/.</p>
<p>Position with scholarship funded by Public Notice Campania Region: "INNOVATIVE PHDS WITH INDUSTRIAL CHARACTERIZATION" PR CAMPANIA ESF+ 2021/2027 - PRIORITY 2 EDUCATION AND TRAINING - SPECIFIC OBJECTIVE ESO 4.7 - ACTION 2. G.4. - D.D. N.100 OF 30.05.2025</p> <p>(the scholarship will be activated subject to authorization for funding by the Campania Region)</p>	<p>"Enhancement of compost to improve biodiversity and soil functionality from a One Health perspective".</p> <p>This research project aims to assess the effectiveness of vermicompost derived from agri-food biomass as a regenerative strategy for agricultural soils, within the 'One Health' framework. By integrating chemical, physical, and biological analyses, the study will explore the effects on soil microbial biodiversity, fertility, and the bioavailability of organic contaminants. Key biological indicators of soil health will be identified, and predictive models for carbon stock estimation will be developed. The project promotes circular economy principles and sustainable agricultural practices, helping to reduce environmental impacts while building green competencies in soil ecology and environmental sustainability, directly contributing to the goals of the European Green Deal.</p>	<p>1 position</p>	<p>To participate in this type of position, it is mandatory to carry out periods of study and research abroad and in companies</p> <p>https://fse.regione.campania.it/dottorati-di-ricerca-innovativi-con-caratterizzazione-industriale/.</p>
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<p>Seat without bag</p>	<p>ISSUES</p> <ol style="list-style-type: none"> 1) Applications for the Environment; 2) Health Applications. 	<p>4 positions</p>	

Reserved place for Foreign State Scholarship holder	ISSUES 1) Applications for the Environment; 2) Health Applications.	1 position	<i>To participate in this type of position, the candidate must already be in possession of financial support guaranteed by a foreign institution</i>
Position with scholarship financed by the funds of the Department of Science and Technology	Cardiac Organoids from iPSCs to Model Human Cardiomyopathies Cardiac organoids derived from induced pluripotent stem cells (iPSCs) represent advanced three-dimensional models for the study of human cardiomyopathies. These systems enable a more faithful reproduction of the structural and functional complexity of the human myocardium, supporting investigations into disease mechanisms and the preclinical screening of new drugs	1 position	

Qualifications for access to the competition

All Master's and Master's Degrees and Degrees obtained according to the system prior to Ministerial Decree 509/99 and 270/2004.

Qualifications and Interview			
Procedures for conducting the competition tests	Evaluation of qualifications through the presentation of the curriculum and documentation	Up to 40 points	<p>a) Degree grade assessable according to proportional parameters or, failing that, the weighted average grade of the exams taken (for those who graduate by 31/10/2025) (up to 8 points);</p> <p>b) Degree thesis in full format (or, for graduating candidates only, drafting of the thesis in the process of being deposited countersigned by the supervisor and with the stamp of the reference department) assessable in consideration of the content and congruence with the PhD (up to 2 points);</p> <p>c) Research project (up to 15 points);</p> <p>d) monographs and publications in peer-reviewed journals or series that can be assessed if they are congruent with the PhD and already published or with a certificate from the publisher, of acceptance and forthcoming publication; - Patents that can be evaluated if congruent with the PhD (Up to 8 points);</p> <p>e) specialization diploma, master's degree of at least one year, issued by universities or qualified research institutions that can be evaluated if congruent with the PhD (up to 2 points);</p> <p>f) Collaboration grants for research activities that can be assessed if congruent with the PhD such as (Up to 5 points)</p> <ul style="list-style-type: none"> • scholarships that can be assessed if awarded following selection procedures carried out exclusively by Italian or foreign universities or by research institutes of primary and proven importance; • periods of study and research abroad (including the Erasmus period) that can be assessed if carried out at universities or qualified research institutes for a continuous period of not less than 3 months; • awards obtained by national and international scientific societies that can be evaluated if congruent with the PhD;
	Interview	30 to 60 points	The oral test will focus on an interview on the qualifications and the research project; it may be carried out by "teleconference" for foreign candidates or for Italian candidates in justified cases on the basis of adequate documentation. It is forbidden to make the audio/video recording of the interview remotely through

			<p>the IT platforms used. It is also forbidden for anyone to disseminate the audio/video recording made with tools other than the platform. The absence of the candidate on the day and time of the oral test will be considered as withdrawal from the competition, whatever the cause. Candidates who have obtained a mark of not less than 30/60 in the interview will pass the oral test.</p> <p>For the evaluation of the oral test (interview), without prejudice to the autonomy of the Selection Committee, for all types of posts, ordinary and reserved, the evaluation criteria are:</p> <p>a) clarity of presentation (up to 20 points)</p> <p>b) synthesis skills (up to 10 points)</p> <p>c) ability to carry out part of the discussion of qualifications in the foreign language chosen from those indicated in the course sheet attached to the call for applications (Up to 10 points)</p> <p>d) ability to answer questions on the research project (up to 20 points)</p>
Competitive Examinations			
	Interview	<p>The day, time and location of the interview will be announced with a notice published on the university website, at the address: https://www.unisannio.it/index.php/it/studente/studente-laureato/dottorato-di-ricerca</p>	