

Ministero dell'Università e della Ricerca



# ANNEX No. 3

## CUP F87G23000140005

# DOCTORAL (Ph.D.) COURSE IN:

# "INNOVATIVE LIFESTYLE INTERVENTIONS FOR HEALTH PROMOTION"

Doctoral Course Coordinator: Prof. Vilberto Stocchi Administrative Office: Department of Human Sciences and Quality of Life Promotion Duration of the Course: 3 years Total Number of Candidates admitted: 14 Number of Scholarships available: 11 Number of Positions without Scholarship: 3

## **PROJECT DESCRIPTION:**

The Doctoral Course "Innovative lifestyle interventions for health promotion" aims to provide integrated, interdisciplinary training aimed at acquiring the skills and knowledge necessary to carry out high-quality research activities in fields related to the two proposed curricula:

#### 1) Physical Activity and Nutrition (PAN)

# 2) Health Psychology and Science Communication (HPSC)

Inadequate or insufficient physical activity (in terms of dose-response) and incorrect eating habits are the main modifiable risk factors for chronic non-communicable diseases development, accounting for about 60% of diseases in Europe and Italy, as defined by the Ministry of Health.

Recent studies show that individual-environment interactions, such as personalized physical exercise and proper nutrition, have a greater impact than genetic factors in determining, through epigenetic mechanisms, the response to disease and promoting an improvement in the quality of life.

However, physical activity and nutrition are aspects of human health that most of the population is not sufficiently aware of, especially in terms of preventive measures. Moreover, the new and broader concept of "food quality" goes beyond mere concept of food safety to promote new lifestyles and consumption patterns. Certification of product and process quality, in various forms, become essential tools in this new scenario.

Risk factors such as poor nutrition and physical inactivity are preventable and require a multidisciplinary approach with a wide range of coordinated interventions at different levels. Such an approach requires the training of new professionals capable of promoting and disseminating the concept of a healthy lifestyle for healthy individuals and offering interventions to prevent the onset

of diseases in individuals exposed to risk factors. For individuals with health conditions, professional skills focused on defining an integrated and transversal strategy in collaboration with social and healthcare services and local stakeholders are even more essential. These interventions aim to slow down the progression of the disease, including the behavioral and nutritional aspects, to optimize the response to pharmacological therapy.

The Doctoral curriculum in *Physical Activity and Nutrition (PAN)* aims to train professionals with the most up-to-date scientific knowledge and technological advances capable of improving the quality of life through the promotion of a healthy lifestyle. The curriculum includes a structured training path focusing on chronic non-communicable diseases with a high impact on healthcare and social assistance systems. This includes aspects related to the molecular mechanisms associated with the development of these pathologies, considering the interactions between individual genetic predisposition factors and lifestyle-related factors, as well as prevention and treatment strategies. The second focus will be on the application of a multidisciplinary approach, in classical and/or translational experimental models, to understand the mechanisms through which nutrition and physical activity can delay and reduce the onset of diseases. The third focus will be on adopting advanced technologies for identifying new functional parameters to more accurately determine the interaction levels of different pathologies with motor outcomes, with the aim of personalized medicine.

The Doctoral curriculum in *Health Psychology and Science Communication (HPSC)* aims to provide advanced training for researchers who can work in various thematic areas of Health Psychology. The curriculum is aimed at training researchers who will be able to analyze psychosocial phenomena as emerging products of social, discursive, and material interactions among social actors within specific communities of practices and activity systems (such as healthcare organizations, companies, work groups, educational contexts, and sports groups).

Students enrolled in this curriculum will be able to understand the psychological processes and intrapsychic and cultural dynamics that organize individual interaction with different reference contexts - health, politics, economy, intercultural interactions, and organizations. Furthermore, they will be able to develop and apply research methodologies aimed at modeling and developing interactive processes between users and health promotion structures from the perspective of primary prevention, promotion of healthy lifestyles, and effective and efficient interaction and communication models.

# **COURSE OBJECTIVES:**

The course is aimed at training researchers capable of conceiving, designing, implementing, and adapting research programs with applications and implications in the field of health, in accordance with Cluster 1 (HEALTH) of Horizon Europe.

The central theme of the Doctorate transcends multiple disciplines and methodologies included in various sectors and scientific areas, aggregated in a training program that includes common/transversal objectives and specific objectives for the two curricula.

The common objectives include:

- an advanced and rigorous training in methodologies for analyzing quantitative and qualitative data.
- the ability to collaborate with various disciplinary and technical fields traditionally linked to the research interests of health and clinical psychology.

- the ability to establish connections with public and private sectors for disseminating research outcomes.
- the possibility to acquire competencies and adequate knowledge of legislation protecting the treatment of personal data and human health.

Concerning the specific objectives, in the Physical Activity and Nutrition (PAN) curriculum, students will be mentored by international experts in different research fields related to nutrition and motor sciences. Through continuous tutoring, the Ph.D. students will become independent in their research activities, and able to design, and implement decisive and innovative intervention programs to improve people's quality of life by changing their habits.

The training objectives of the PAN curriculum will include advanced knowledge in the biomedical/clinical and technological domains through:

- understanding the mechanisms through which physical activity can influence health and reduce risk factors for chronic non-communicable diseases with a high impact on healthcare and social assistance systems.
- creating new tools and applying advanced technologies to personalize physical exercise adapted to the functional recovery of individuals of different age groups and physical conditions.
- defining methods for evaluating alterations in nutritional status (malnutrition due to excess or deficiency).
- acquiring knowledge of product and process quality certification tools in the agri-food system.
- developing innovative nutritional treatments to improve the clinical management of patients from the perspective of personalized and precision medicine.
- understanding technological and informatics processes useful for the development and application of functional and biomechanical evaluation tools for human performance.

Competencies in machine learning and the organization of customized environments through augmented immersive and mixed reality in the context of bioengineering applied to human movement will also be developed.

The Doctoral curriculum in HPSC aims to provide advanced training for researchers who can work in various thematic areas of Health Psychology.

Specific objectives include:

- studying the interactions between society, nutrition, physical activity, and lifestyles to analyze the media's ability to promote the development of new communication strategies, also through new digital channels and social networks, aimed at promoting a healthy and sustainable lifestyle.
- understanding different theoretical and epistemological paradigms of the research in the field of Health and Clinical Psychology.
- acquiring methodological skills in terms of planning investigations operationally consistent with the adopted theoretical and epistemological paradigms.

The training objectives of the Doctorate courses also include acquiring skills related to research project design and management, presentation and discussion of results, writing reports and scientific publications, as well as an in-depth understanding of intellectual property issues.

The enhancement and dissemination of research results will be guaranteed according to the principles of Open Science and FAIR Data, making research more transparent and promoting collaboration among researchers. These principles facilitate data reuse and future sharing, meet the requirements of funding bodies (Funders' data policies), and increase the visibility and impact of public investments. Dissemination of research products will be encouraged according to a knowledge circulation model that uses two channels to make digital content available according to the standards of open access: self-archiving in open archives and publication in open-access journals.

# **JOB OPPORTUNITIES:**

The Doctoral course in Innovative lifestyle interventions for health promotion aims to train professionals capable of working across various sectors, including nutrition, human nutrition, movement, and life sciences, with a multidisciplinary set of knowledge and skills ranging from biomedical and biomechanical to psychological, legal, and economic-commercial fields.

The acquired competencies will enable the Ph.D. to pursue an academic career at universities and research institutes, both public and private, operating at national and international levels. Moreover, opportunities will be available in companies, public administration, specialized institutions, including those operating in the social areas of research, where advanced knowledge and skills in human nutrition, quality of agri-food products, and related certifications (product and process), physical activity, health communication, and the protection of the right to health and personal data treatment are required.

**Scientific Research areas of reference:** BIO/10; MED/26; MED/42; MED/13; MED/09; BIO/12; BIO/09; M-PSI/07; BIO/13; M-PSI/04; MED/07; ING-IND/34; IUS/01; SPS/08; M-EDF/02; BIO/14; M-EDF/02; SECS-P/13; MED/04

# CONTEST POSITIONS AND RESEARCH PROJECTS THEMES:

The candidate must specify in the application the type of scholarship and the relevant research topic, preferably chosen from those indicated in the tables below. The description of the relevant thematic areas is provided in the next paragraphs.

Candidates must refer to Attachment D for the drafting of the research project.

Positions	<b>Doctoral scholarships</b> <b>funded by third</b> <b>parties</b> (curriculum HPSC)	n.4	<b>Research</b> Psychology: communicat	<b>1_HPSC:</b> evention, peutic adherer	Health health nce
	III'SC)		Research Psychology: interventions	2_HPSC: Psycho-edu ote a healthy l	

Positions	Doctoral scholarships under PNRR D.M. 118/2023- M4C1-Inv.4.1 – PNRR (generic) (curriculum PAN) CUP: F87G23000140005	n.7	<ul> <li>Research Topic 1_PAN: Research methods, statistics and data management</li> <li>Research Topic 2_PAN: Privacy and artificial intelligence</li> <li>Research Project Thematic 3_PAN: The Impact of Physical Activity and Nutrition on Non-Communicable Chronic Diseases: Molecular and Cellular Mechanisms</li> <li>Research Topic 4_PAN: Human Nutrition Science and Quality Promotion in Agrifood Chains</li> <li>Research Project Thematic 5_PAN: Bioengineering of human movement</li> <li>Research Topic 6_PAN: Functional Assessment and Performance Analysis</li> <li>Research Topic 7_PAN: Role of Physical Exercise in Disease Prevention and Enhancing Quality of Life</li> </ul>
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Positions	<b>Unfunded</b> <b>scholarship</b> (Curricula HPSC e	n.3	The project for these positions is chosen by each candidate and must fall within the general research themes of the two
	PAN)		aforementioned Doctoral curricula

The relevant research topics for the preparation of the research project, within the curriculum of Health Psychology and Scientific Communication (HPSC) (Doctoral Scholarships funded by Third-Party Entities) are chosen by the candidate, preferably from those described below:

Research Topic 1_HPSC	Health Psychology: Prevention, health communication, therapeutic adherence
Brief Description of the Training and Research Activities:	The area is characterized by the study of advanced models of Health Psychology. Along with a solid methodological foundation, specific attention will be given to the analysis of interactions between healthcare professionals and patients, between patients and their families, and between the public and health-promoting institutions, all from a perspective focused on primary prevention, promoting healthy lifestyles, and developing effective models of interaction and communication. Doctoral candidates, under the guidance of their tutor, will conduct research at companies and institutions within the sector.
Research Activities at Companies/Research Centers:	Optional research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay at Companies/Research Centers:	Optional 6 to 12 months.
Optional Research Activities to be Conducted Abroad	Research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay Abroad	Optional 6 months, up to a maximum of 12 months within the three-year program, even if non-consecutive.
Host Institution's Name	International research institutions that have already signed or will sign a collaboration agreement with the PhD program in HPSC

Research Topic 2_HPSC	Health Psychology: Psycho-educational interventions to promote a healthy lifestyle
Brief Description of the Training and	The area is characterized by the study of
Research Activities	advanced models of Health Psychology. Along with a solid methodological foundation, specific attention will be given to the analysis of strategies for designing and evaluating health education programs. Throughout the course, close collaboration with companies and institutions engaged in the field will be possible, fostering a fruitful dialogue between academia

	and industry. By the end of the research program, Doctoral candidates will be equipped to assess needs, develop prevention programs and interventions, and evaluate their effects.
Research Activities at Companies/Research Centers:	Optional research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay at Companies/Research Centers:	Optional 6 to 12 months.
Optional Research Activities to be Conducted Abroad:	Research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay Abroad:	Optional 6 months, up to a maximum of 12 months within the three-year program, even if non-consecutive.
Host Institution's Name:	International research institutions that have already signed or will sign a collaboration agreement with the PhD program in HPSC

The relevant research topics for the preparation of the research project within the curriculum of Physical Activity and Nutrition (PAN) curriculum for Ph.D. scholarships under the PNRR pursuant to Decree No. 118/2023 - M4C1-Inv.4.1 – PNRR doctoral programs (generic) are chosen by the candidate, preferably from those described below:

Research Topic 1_PAN Title	Research methods, statistics and data management
Brief Description of the Training and Research Activities	Rescarent methods, statistics and datamanagementThis thematic area focuses on the application of advanced knowledge in the field of research methodology, statistics, and data management, within the domains of physical activity and 
Research Activities at Companies/Research Centers:	<ul><li>currently essential in nutrition and physical activity-related professional activities.</li><li>Optional research or training activities to be agreed upon with the tutor based on the specific research project.</li></ul>
Duration of Stay at Companies/Research	Optional 6 to 12 months.
Centers: Company Name (Legal Name, Registered Office, Legal Representative) / Research Center	Companies and enterprises that have already signed or will sign a collaboration agreement with the PhD program in PAN.
Research Activities to be Conducted Abroad:	Research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a maximum of 12 months within the three-year program, even if non-consecutive.

Host Institution's Name:	International research institutions that have
	already signed or will sign a collaboration
	agreement with the PhD program in PAN

<b>Research Topic 2_PAN Title</b>	Privacy and artificial intelligence
Brief Description of the Training and Research Activities	This thematic area focuses on deepening knowledge about the protections guaranteed to personal and health data processed with artificial intelligence. The Doctoral candidate will be guided and supported by a scientific supervisor (tutor) and potentially other professionals to develop a specific project related to this thematic area, in order to achieve the predefined objectives by the end of the three- year program. The interdisciplinary nature of privacy law and its compliance in the treatment of data used in statistical analyses and scientific research require the student to be familiar with and implement the essential regulations for managing personal and sensitive data concerning an individual's intimate sphere. This includes information about lifestyle habits, dietary trends, health, and even data that can infer consumption habits and sexual orientation of a person, especially in light of new treatment dynamics known from artificial intelligence systems and algorithmic clustering.
Research Activities at Companies/Research Centers:	Optional research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay at Companies/Research Centers:	Optional 6 to 12 months.
Company Name (Legal Name, Registered Office, Legal Representative) / Research Center	Companies and enterprises that have already signed or will sign a collaboration agreement with the PhD program in PAN.
<b>Research Activities to be Conducted Abroad:</b>	Research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a maximum of 12 months within the three-year program, even if non-consecutive.
Host Institution's Name:	International research institutions that have already signed or will sign a collaboration agreement with the PhD program in PAN

Research Topic 3_ PAN Title Brief Description of the Training and Research Activities	The Impact of Physical Activity and Nutrition on Non-Communicable Chronic Diseases: Molecular and Cellular MechanismsThis thematic area is focused on the study of Non-Communicable Diseases (NCDs), which have a high impact on the national healthcare system and include neurological, 
Research Activities at Companies/Research	can investigate the mechanisms through which nutrition and/or physical activity may influence the onset of NCDs. The ultimate goal is to lay the foundation for targeted and personalized interventions capable of improving public health and quality of life.
Centers: Duration of Stay at Companies/Research Centers:	agreed upon with the tutor based on the specific research project. Optional 6 to 12 months.
Company Name (Legal Name, Registered Office, Legal Representative) / Research Center	Companies and enterprises that have already signed or will sign a collaboration agreement with the PhD program in PAN.
<b>Research Activities to be Conducted Abroad:</b>	Research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a maximum of 12 months within the three-year program, even if non-consecutive.

Host Institution's Name:	International research institutions that have	
	already signed or will sign a collaboration	
	agreement with the PhD program in PAN	

Research Topic 4 PAN Title	Human Nutrition Science and Quality
Research Topic 4_1 Aiv Thie	Promotion in Agrifood Chains
Brief Description of the Training and Research Activities:	This thematic area aims to train professionals capable of managing the most relevant issues related to human nutrition, including those concerning the promotion of quality in food supply chains. The Doctoral candidate will be guided and supported by a scientific supervisor (tutor) and potentially other professionals to develop a specific project related to this thematic area, ensuring the achievement of the predefined objectives by the end of the three- year program.
	This will be achieved through specific training programs that address various aspects of human nutrition, from the biology of macronutrients to hormonal and metabolic control of digestion, and its impact on human health throughout the entire life cycle, from early childhood to adolescence, pregnancy, and geriatrics, as well as public health. Additionally, the Doctoral candidate will acquire knowledge on the prevention of chronic-degenerative diseases (such as tumors, cardiovascular and neurological diseases) related to lifestyle and nutrition, and will study the fundamental principles of food safety, quality, and sustainability, considering the triple environmental, economic, and social dimensions in agrifood supply chains. Moreover, this thematic area aims to offer an integrated approach to studying and evaluating product and process quality in agrifood supply chains. The objective is to provide Doctoral candidates with the necessary skills and tools to face emerging challenges and contribute to the identification of innovative solutions for product quality, certification, and traceability in agri-food supply chains.
<b>Research Activities at Companies/Research Centers:</b>	Optional research or training activities to be agreed upon with the tutor based on the specific
	research project.
Duration of Stay at Companies/Research Centers:	Optional 6 to 12 months.

Company Name (Legal Name, Registered	Companies and enterprises that have already
Office, Legal Representative) / Research	signed or will sign a collaboration agreement
Center	with the PhD program in PAN.
<b>Research Activities to be Conducted</b>	Research or training activities to be agreed upon
Abroad:	with the tutor based on the specific research
	project.
Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a maximum of 12 months within the three-year
	program, even if non-consecutive.
Host Institution's Name:	International research institutions that have
	already signed or will sign a collaboration
	agreement with the PhD program in PAN

Research Topic 5_PAN Title	Bioengineering of human movement
Brief Description of the Training and Research Activities:	This thematic area aims to train professionals capable of applying the principles of bioengineering to the study of human movement. The Doctoral candidate will be guided and supported by a scientific supervisor (tutor) and potentially other professionals to develop a specific project related to this thematic area, ensuring the achievement of the predefined objectives by the end of the three- year program.
	Research in the field of movement bioengineering is of significant importance considering the high impact that technology has had on physical activity, sports, and nutrition, thanks to the increasing availability of modern devices and the simultaneous reduction of costs. Bioengineering and advances in technology have profoundly affected various aspects of physical activity in sports competitions, including the possibility of performance analysis conducted both offline and online. The integration of technology in sports, physical activities, and nutrition has led to remarkable progress and innovations in research, design, and production of materials, tools, equipment, and even clothing, such as "smart clothing" or intelligent apparel. The use of inertial sensors and wearable technologies, such as exoskeletons, is increasingly emerging, shifting the focus of research and development from laboratory environments to competitive activities or daily physical activities. Currently,

	mionoconconcer and widely seed in a wide seed of
	microsensors are widely used in a wide range of activities to monitor human performance,
	including training control, improving training
	methodologies, and optimizing the potential for
	human performance improvement.
	In this thematic area, the Doctoral candidate will
	acquire the fundamental skills to apply the
	principles of bioengineering to the study of human movement and explore possible
	connections between nutrition and physical
	performance. Finally, they can investigate the
	principles of Industrial Bioengineering
	methodologies for the development of hybrid
	systems - mixed reality/sensor systems for the
	implementation and evaluation of physical
	activity and sports protocols - aimed at
	promoting healthy lifestyles and active aging.
<b>Research Activities at Companies/Research</b>	Optional research or training activities to be
Centers:	agreed upon with the tutor based on the specific
	research project.
Duration of Stay at Companies/Research	Optional 6 to 12 months.
Centers:	
Company Name (Legal Name, Registered	Companies and enterprises that have already
Office, Legal Representative) / Research Center	signed or will sign a collaboration agreement with the PhD program in PAN.
Center	with the Fild program in FAN.
Research Activities to be Conducted	Research or training activities to be agreed upon
Abroad:	with the tutor based on the specific research
	project.
Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a
	maximum of 12 months within the three-year
	program, even if non-consecutive.
Host Institution's Name:	International research institutions that have
	already signed or will sign a collaboration agreement with the PhD program in PAN
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Research Topic 6_PAN Title	Functional Assessment and Performance Analysis
Brief Description of the Training and	This thematic area aims to deepen knowledge
Research Activities:	about functional assessment and performance
	analysis to maximize individual fitness levels
	and technical skills in sports and physical
	activities. The focus will be on the development
	of assessment procedures directly on the field or
	in everyday environments. The Doctoral

Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a maximum of 12 months within the three-year
	program, even if non-consecutive.
Host Institution's Name:	International research institutions that have
	already signed or will sign a collaboration
	agreement with the PhD program in PAN

Research Topic 7_PAN Title	Role of Physical Exercise in Disease
	Prevention and Enhancing Quality of Life
Brief Description of the Training and	This thematic area aims to train professionals
Research Activities:	capable of promoting physical activity to
	improve people's health. The Doctoral candidate
	will be guided and supported by a scientific
	supervisor (tutor) and potentially other
	professionals to develop a specific project
	related to this thematic area, ensuring the
	achievement of predefined objectives by the end
	of the three-year program. The Doctoral
	candidate will have the opportunity to address
	various aspects relevant to this thematic area.
	Particular emphasis will be given to the
	importance of physical activity in maintaining an individual's psychophysical balance.
	an individual's psychophysical balance.
	It has been demonstrated that regular and
	prolonged physical activity (aerobic exercise)
	significantly contributes to reducing the
	incidence of neurodegenerative and
	neuromuscular diseases often associated with
	aging while simultaneously strengthening the
	immune system. Promoting physical activity,
	therefore, helps prevent today's major health
	challenges, such as diabetes, high blood
	pressure, cardiorespiratory diseases, obesity,
	osteoporosis, arthritis, and cancer, thus leading
	to a reduction in healthcare costs and freeing up
Degeneral Activities of Companies/Degeneral	resources for future generations.
Research Activities at Companies/Research Centers:	Optional research or training activities to be agreed upon with the tutor based on the specific
Centers.	research project
Duration of Stay at Companies/Research	Optional 6 to 12 months
Centers:	
Company Name (Legal Name, Registered	Companies and enterprises that have already
Office, Legal Representative) / Research	signed or will sign a collaboration agreement
Center	with the PhD program in PAN

Research Activities to be Conducted Abroad:	Research or training activities to be agreed upon with the tutor based on the specific research project.
Duration of Stay Abroad:	Mandatory minimum of 6 months, up to a maximum of 12 months within the three-year program, even if non-consecutive.
Host Institution's Name:	International research institutions that have already signed or will sign a collaboration agreement with the PhD program in PAN

I hereby declare that the relevant research topics for the research projects funded by the Doctoral scholarships PNRR ex DM118/2023 are:

- In line with the objectives and purposes of Regulation (EU) 2021/241, the overall strategy, and the detailed Sheet of the PNRR Component;
- Oriented towards achieving results measured with reference to milestones and targets eventually assigned to the Investment within the terms established by the Plan;
- In compliance with the "do no significant harm" (DNSH) principle under Article 17 of Regulation (EU) 2020/852, in coherence with the technical guidance prepared by the European Commission (Communication of the European Commission 2021/C58/01);
- > Suitable for addressing and bridging gender inequalities;
- In support of the participation of women and youth, also in line with the provisions of Decree-Law of May 31, 2021, No. 77 (so-called Simplification Decree), as amended by the conversion law of July 29, 2021, No. 108, concerning the management of the National Recovery and Resilience Plan (PNRR).

Rome, July 27, 2023

COORDINATOR'S SIGNATURE

The Rector Prof. Vilberto Stocchi

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