Università San Raffaele Roma

Università Telematica San Raffaele Roma s.r.l.
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STUDY PLAN OF THE PhD PROGRAMME IN "INNOVATIVE LIFESTYLE INTERVENTIONS FOR HEALTH PROMOTION"

XL CYCLE

CURRICULA

- **Health Psychology and Science Communication (HPSC)**
- **Physical Activity and Nutrition (PAN)**

Courses:

1. **RESEARCH METHODS AND DATA MANAGEMENT**

Lecturers: Bonassi, Ruscello, Mannocci, Stocchi F
Total number of hours over the entire cycle: 30 hours
Distribution during the PhD programme (years in which the course is offered): 1^ and 2^ year_**PAN** and **HPSC**
Course description: The course aims to provide advanced knowledge of Research Methodology, Statistics, and Data Management, allowing students to understand and appropriately use the main statistical, research, and data management methods adopted in the fields of physical activity and nutrition.
Specifically, the educational path aims to enable students to design appropriate research designs, gather and describe research data using appropriate measures of central tendency and dispersion, use basic probability calculation tools, perform statistical inferences on the investigate d variables, and produce summary reports to promote informed decision- making processes.
To this end, the course also provides basic knowledge and skills regarding the treatment of collected data, through the use of the most commonly used software applications in the professional field, which are now essential in professional activities.

PROGRAM MODULES:
A) Research Methodology 1 – 3 hours
B) Study design and clinical research 1 – 3 hours
C) Statistics 1 – 3 hours
D) Data Management 1 – 3 hours
E) Clinical data management 1 – 3 hours
F) Research methodology 2 – 3 hours
G) Study design and clinical research 2 – 3 hours
H) Statistics 2 – 3 hours
I) Data management 2 – 3 hours
L) Clinical Data Management 2 – 3 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

– PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final evaluation: NO
Attendance is mandatory for all admitted students. There will be no final examination, as the PhD program has a distinctly practical orientation, designed to allow for one-on-one interaction with students and to enable the assessment of the skills they have acquired.

2. PRIVACY AND ARTIFICIAL INTELLIGENCE

Lecturers: Marseglia, Scarpato
Total number of hours over the entire cycle: 5 hours
Distribution during the PhD programme (years in which the course is offered): 1^ and 2^ year_**PAN** and **HPSC**
Course description: The discipline of the right to privacy is applicable to a wide range of sectors, including statistics and scientific research. Personal data and information, even if anonymized or encrypted, must be processed in full compliance with regulatory requirements. In this field, the need to handle personal data related to an individual's intimate sphere with particular care is paramount. Such data includes information about an individual's lifestyle habits, dietary tendencies, health, and even data that can infer their consumption habits and sexual orientation.

PROGRAM MODULES:
A) From the right to be left alone to the right to privacy – 2 hours
B) Constitutionally guaranteed rights and the processing of personal data Regulation (EU) 2016/679 of the European parliament and of the council – 2 hours
C) Data processing and artificial intelligence – 1 hour

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC) – PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final assessment: NO
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3. MOLECULAR MECHANISMS OF CHRONIC NON-COMMUNICABLE DISEASES

Lecturers: Caprio/Muscogiuri, Ghiglieri/Radicati, Mandolesi/Musella, Stocchi F, Lombardo, Conte, De Iure
Total number of hours over the entire cycle: 16 hours
Distribution during the PhD programme (years in which the course is offered): 1^ and 2^ year _**PAN**
Course description: The course offers a comprehensive overview on the molecular mechanism s underlying disease initiation and progression.

PROGRAM MODULES:
A) Supplements and nutraceuticals in daily clinical practice: utility and misuse – 2 hours
B) Hormonal regulation and nutrition – 2 hours
C) Gut-brain axis relationships – 2 hours

D) Neuroimmune crosstalk – 2 hours
E) The role of nutrition in preventing obesity and obesity-related metabolic alterations – 2 hours
F) Sleep disorders related to metabolic diseases – 2 hours
G) Plasticity of the central and peripheral nervous system in health and disease – 2 hours
H) Cellular and molecular mechanisms of impulse control disorders from binge eating to compulsive exercise – 2 hours

Curriculum: PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final assessment: NO
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4. HUMAN NUTRITION SCIENCES AND QUALITY IN AGRIFOOD CHAINS

Lecturers: Bonassi, Feraco/Camajani, Tripodi, Muscogiuri, Supino/Esposito
Total number of hours over the entire cycle: 20 hours
Distribution during the PhD programme (years in which the course is offered): 1^ and 2^ year_ **PAN**
Course description: The course is designed to train healthcare professional s of different background to manage all relevant issues related to human nutrition.
This will be obtained through a specific training program addressing all aspects of human nutrition, from biology of macronutrients to the hormonal and metabolic control of digestion, its impact on human health over the entire life cycle, from early infancy, to adolescence, pregnancy and geriatrics, and on public health. The course will also provide knowledge on the prevention of chronic- degenerative diseases (tumors, cardiovascular and neurological diseases) related to lifestyle and nutrition, and will address basic principles of food safety and environmental sustainability, in order to promote and disseminate the concept of food which should be beneficial for human health and environment.

The course also offers an integrated approach to the study and assessment of product and process quality in the agri-food chains. The goal is to provide students with the necessary skills and tools to analyze challenges and to contribute to solutions within the fields of food quality, food quality disclosure and product certification, quality policy and traceability in agri-food supply- chains.

PROGRAM MODULES:
A1) Mechanisms of nutrients digestion 1 - 2 hours
A2) Mechanisms of nutrients digestion 2 – 2 hours
B1) Principles of healthy nutritional patterns 1 – 2 hours
B2) Principles of healthy nutritional patterns 2 – 2 hours
C1) Product and process quality in the agri-food chains 1 – 3 hours
C2) Product and process quality in the agri-food chains 2 – 3 hours
D) Chrononutrition – 2 hours

E1) Sustainable diets, impact on the environment and protection of planetary health 1 – 2 hours
E2) Sustainable diets, impact on the environment and protection of planetary health 2 – 2 hours

Curriculum: PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final assessment: NO
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5. INVESTIGATING AND PROMOTING BIOPSYCHOSOCIAL HEALTH

Lecturers: Barbanti, Gennaro/Limone, Micalizzi
Total number of hours over the entire cycle: 10 hours
Distribution during the PhD programme (years in which the course is offered): 1^ year_ **HPSC**
Course description: The biopsychosocial model acknowledges that episodes of stress and poor mental health can contribute to bodily illness. The course aims to provide students with the scientific and cultural tools to understand the physiologic al means allowing to maintain a functional relationship with the environment. Specifically, the course face health topics, such as disease and lifestyle conditions highlighting the role of physical, psychologic al, and social environment we are in has on these health concerns.
By attending the course, the competencies of health sector actors to establish, support and scale up health perspective s will be improved. The focus on existing practical, evidence- based, scalable tools and practice-led approaches for successful implementation of projects aims to strengthen and promote health investigation according to a biopsychosocial perspective. In this vein the course will develop skills favoring the view of health and disease as dependent on the interactions between the biological aspects, the aspects of mental and emotional wellness that also relate to behavior and the interpersonal factors such as social interactions and community activities.
Activities, strongly referenced to existing literature, will provide the students elements supporting their development of own perspective on specific, contemporary topics and will understand why health behaviors are challenging to change and the most effective change programs to use for managing them.

PROGRAM MODULES:
A) Health and wellbeing in psychological perspective - 3 hours
B) Health and new technologies - 2 hours
C) Effects of sleep on brain health - 3 hours
D) Narrative methods to explore biopsychosocial health - 2 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

Final assessment: NO
Attendance is mandatory for all admitted students. Attendance will be optional for students enrolled in the Physical Activity and Nutrition curriculum. There will be no final examination, as the PhD program has a distinctly practical orientation, designed to allow for one-on-one

interaction with students and to enable the assessment of the skills they have acquire.

6. BIOENGINEERING OF HUMAN MOVEMENT

Lecturers: Ruscello, Franzò, Romagnoli, Infarinato
Total number of hours over the entire cycle: 16 hours
Distribution during the PhD programme (years in which the course is offered): 1^, 2^ and 3^ years__ **PAN**
Course description: The impact of technology on physical activity, sport and nutrition has experienced significant growth due to the increased accessibility of various devices and the simultaneous reduction in costs observed in recent years.
Bioengineering and the advancements in technology have had a profound impact on various aspects of sports competitions and physical activities, including their analysis conducted both offline and online. The integration of technologies in sports, physical activities and nutrition has facilitated notable progress and innovation in the research, design, and manufacturing of materials, tools, equipment, and even clothing, such as smart clothing. The utilization of inertial sensors and wearable technologies, such as exoskeletons, is experiencing a growing trend, shifting the focus of research and development from laboratory settings to the competitive field or the daily physical activities.
Micro-sensors are currently extensively utilized in a wide range of physical activities to monitor human performance, including training control, improve training methodologies, and optimize the potential for human performance enhancement. This course aims to provide fundamental skills in applying bioengineering principles to the study of human movement and exploring potential connections between nutrition and physical performance.

PROGRAM MODULES:
A) Sensor properties and characteristics - 2 hours
B) Sensors for human movements and applications 1 - 2 hours
C1) Inertial measurement sensors 1- 2 hours
C2) Inertial measurement sensors 2 -2 hours
D) Sensors for human movements and applications 2 - 2 hours
E) Angle and displacement sensors - 2 ore hours
F) Wearable technologies - 2 hours
G) Optical measurement sensors - 2 hours

Curriculum: PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final assessment: NO Attendance is mandatory for all admitted students. Attendance will be optional for students enrolled in the Health Psychology and Science Communication curriculum. There will be no final examination, as the PhD program has a distinctly practical focus, aimed at enabling one-on-one interaction with students and allowing for the evaluation of the skills they have acquired.

7. FUNCTIONAL ASSESSMENT AND PERFORMANCE ANALYSIS

Lecturers: Padua/Guidotti, Ruscello/Filetti/Briotti, Goffredo, Romagnoli, Messina
Total number of hours over the entire cycle: 15 hours
Distribution during the PhD programme (years in which the course is offered): 2^ and 3^ year_**PAN**

Course description: In sports and physical activities, the Individual Fitness Level (IFL) and the mastery of specific Technical Skills (TSM) play crucial roles in performance. Coaches and practitioners undertake Conditioning and Training processes to maximize the individual potential in these areas. These processes are highly complex and not yet fully understood or mastered by experts.
A significant portion of Sport and Physical Activity Sciences research focuses on studying and investigating this main topic.
Typically, laboratory settings with specialized equipment and controlled environmental conditions are used for physical testing and evaluating human performance (e.g., functional evaluation). However, the traditional evaluation tests and instruments used in such settings, such as treadmills, cycle ergometers, and gas exchange analyzers, often lack ecological validity. They require individuals to assume postures or perform gestures that may differ from actual competition conditions. Currently, there is a growing demand for the opportunity to conduct assessment procedures directly on the field or in everyday environments.

PROGRAM MODULES:
A) Neuromuscular and metabolic assessment of physical exercise – 3 hours
B) Inertial Sensors in Sports and clinical assessment – 2 hours
C1) Analysis of performance models – 2 hours
C2) Analysis of performance
D) Technological advances in functional assessment – 2 hours
E) New systems of video analysis in the assessment of the human movement – 2 hours
models – 2 hours
C3) Analysis of performance models – 2 hours

Curriculum: PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final Assessment: NO
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8. ROLE OF PHYSICAL EXERCISE IN PREVENTING DISEASE AND IMPROVING QUALITY OF LIFE

Lecturers: Caprio, Conte, Ghiglieri, Stocchi V, De Pandis, Costici
Total number of hours over the entire cycle: 20 hours
Distribution during the PhD programme (years in which the course is offered): 1^, 2^ and 3^ hours_**PAN**
Course description: The Course will focus on the important role of physical activity in maintaining and individual's pyscho-physical balance. In particular, it has been demonstrated that prolonged regular physical activity (aerobic exercise) helps to significantly reduce the incidence of neurodegenerative and neuromuscular diseases, which are often associated with aging, while at the same time bolstering the immune system. Promoting physical activity therefore helps preventing 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 resources for future generations.

PROGRAM MODULES:
A1) Molecular modifications induced by physical exercise 1 – 2 hours
A2) Molecular modifications induced by physical exercise 2 – 2 hours
B) Molecular modifications induced by aerobic and high-intensity physical exercise – 2 hours
C) Physical exercise, Hormonal and Metabolic changes - 2 hours
D1) Aging and chronic non- communicable diseases 1 – 2 hours
D2) Aging and chronic non- communicable diseases 2 – 2 hours
E1) Role of physical exercise in preventing neurodegenerative diseases 1 – 2 hours
E2) Correlation between physical activity and the prevention of scoliosis and other spinal disorders in the pediatric population. 1 – 2 hours
F1) Adaptations of autonomic control in health and in cardiovascular and neuromuscular diseases 1 – 2 hours
F2) Adaptations of autonomic control in health and in cardiovascular and neuromuscular diseases 2 – 2 hours

Curriculum: PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final assessment: NO
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9. HUMAN PHYSIOLOGY IN SOCIAL, BIOMEDICAL AND BEHAVIORALSCIENCES

Lecturers: Barbanti, Gennaro, Calabrese
Total number of hours over the entire cycle: 13 hours
Distribution during the PhD programme (years in which the course is offered): 1^ and 2^ year__**HPSC**
Course description: Embodied Cognition represents the greatest innovation in cognitive psychology of the last twenty years. Underlying this program is the idea that cognitive processes depend on, reflect, or are influenced by the body's control systems.
Embodiment-based research has shown that interpersonal processes, such as synchrony and attunement, are critical for the development of crucial therapist skills and that these mechanisms are mediated by physiologic al processes. Accordingly, the course aims to develop basic physiologic al and neuroscientific knowledge in trainees and increase their awareness on how psychological and social experience can influence both health and disease. In this vein the first part of the course will focus on the presentation of studies and research work on topics such as intersubjective attunement, behavioral synchrony and emotional processes in order to increase into students the awareness of the physiologic al correlates in communicative and psychologic al processes. The second part of the course will address some of the main topics of debate in the Embodied Cognition, from the discussion on the role of representation, to the relationship with inactivism, to that with functionalism and the idea of the extended mind.
Against a reading that sees the embodied cognition as a simple evolution of the classical cognitivist program, we focus on the aspects that highlight its crucial discontinuities, suggesting rather the recovery of previous traditions such as American pragmatism, ecological psychology, phenomenology.

PROGRAM MODULES:
A) Neurophysiological mechanisms of mindfulness – 3 hours

B) Perspectives of biopsychosocial approaches in biomedical sciences – 2 hours
C) Psychophysiology of eating disorders- 3 hours
D) Intersubjective attunement and compliance - 2 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

Final assessment: NO
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10. PSYCHOSOCIAL FACTORS IN HEALTH AND DISEASE

Lecturers: Barbanti, Gennaro, Micalizzi
Total number of hours over the entire cycle: 10 hours
Distribution during the PhD programme (years in which the course is offered): 1^ year__**HPSC**
Course description: Through the analysis of prominent scientific papers and through the presentation of different theoretical frameworks during the course students will deepen their knowledge about the role of individual and social resources to build and control health through the adoption of healthy lifestyles.
Specifically, the course will analyze the role of cognitive, affective - emotional, psychosocial, behavioral, social and cultural factors and their mediation and/or moderator role toward the onsetting of behaviors able to promote or hinder the promotion and maintenance of health according to a biopsychosocial perspective; the prevention and treatment of diseases and their psychologic al correlates; the analysis and improvement of health protection systems and the contribution to the elaboration of health policies in favor of the communities lifestyles and skills to face stressful conditions; b) psychoeducational intervention s with respect to health and illness; c) intervention s aimed to promote individual development and psychophysical well-being; d) community empowerment programs to help individuals and social groups to have greater control over their health and enhance their quality of life. Finally through the presentation and the group discussion about intervention project specific attention will be given to the development of skills in design, implement and evaluate: a) interventions aimed at developing healthy lifestyles and skills to face stressful conditions; b) psychoeducational intervention s with respect to health and illness; c) interventions aimed to promote individual development and psychophysical well- being; d) community empowerment programs to help individuals and social groups to have greater control over their health and enhance their quality of life.

PROGRAM MODULES:
A) Culture and development – 3 hours
B) Culture and behaviors - 3 hours
C) Social impacts of scientific research - 2 hours
D) Lifestyle and neurological disorders – 2 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

Final assessment: NO

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11. HEALTH BEHAVIORAL CHANGE

Lecturers: Barbanti, Gennaro, Micalizzi
Total number of hours over the entire cycle: 10 hours
Distribution during the PhD programme (years in which the course is offered): 2^ year__**HPSC**
Course description: Through the deepening of different theoretical approaches according to existing literature on health behavior change students will learn strategies to support people in engaging healthy behaviors to prevent the development or worsening of chronic disease and to improve mental health and well-being. Specifically, the course will focus issue of the mechanism s of change, namely how and when change occurs, which mechanisms support it and how socio-relational contexts work as field condition able to protect or hinder behavioral change. Understanding of the mechanism s of change is the key element to build more efficient behavior change intervention s and to create an evidence base that reveals what works for which populations in what contexts and for which behaviors. Through the deepening of literature reviews, metareview s and research papers, attendant on one hand will increase their knowledge on behavioral, affective and relational components promoting health behavioral change, On the other hand according to an intensive statistically based labapproach student will be supported in developing analysis strategies and statistical methodologies able to detect if and how change process occurs. In the light of the developed skills students will be able to design and evaluate in autonomous way the dimensions of change that underlie the promotion of functional lifestyle model.

PROGRAM MODULES:
A) Personality, adaptive emotional reactions and psychiatric comorbidities in headache – 3 hours
B) Affects and text analysis – 3 hours
C_1) Narrative data analysis 1– 2 hours
C_2) Narrative data analysis 2– 2 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

Final assessment: NO
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12. SCIENCE COMMUNICATION

Lecturers: Guadagni, Limana, Migliaccio, Grassi
Total number of hours over the entire cycle: 10 hours
Distribution during the PhD programme (years in which the course is offered): 2^ and 3^ year__**HPSC** and **PAN**

Course description: The course supports attendee in their ability to share and engage through academic research those who have no study or work relationship with the university and therefore could be considered as a public commitment. Through a laboratory- type didactical approach and through cases studies presentations, the course will explore the issue of the effectiveness of scientific communication. Specifically, the following topics will be addressed:
a) the development of papers for scientific journal submission. This part of the course is devoted to increase into students the awareness about the typical features of a scientific paper in terms of specificities concerning the problem setting into the introductive part, hypotheses definition, the methodological section structure and results discussion presentation; b) the development of project proposal for grant applications: specifically, dedicated pages for granting proposal will be presented and students will be guided in the identification of grant characteristics and specific. Then basic skills concerning the characteristics features of a grant submission form will be outlined; c) the development of public engagement through scientifically informed approaches will be deepened. Specifically, throughout case presentations students will train their ability to engage the intervention request from public and/or private organizations which represents an essential element for establishing and strengthening stable relationships of listening, discussion and collaboration with civil society.

PROGRAM MODULES:
A) How to prepare a poster and oral presentation – 2 hours
B) How to write a paper for scientific journal submission – 3 hours
C) How to write a successful research grant application – 3 hours
D) Future challanges for health and science– 2 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC) PHYSICAL ACTIVITY AND NUTRITION (PAN)

Final assessment: NO
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13. MEDIA REPRESENTATION OF SCIENCE

Lecturers: Barbanti, Gennaro, Grassi, Micalizzi
Total number of hours over the entire cycle: 8 hours
Distribution during the PhD programme (years in which the course is offered): 2^ year__**HPSC**
Course description: Science communication often falls in delivering advancement in scientific knowledge to population in light of the cultural divide between science and the general public. From a semiotic point-of-view, scientists have a distinct disadvantage when trying to communicate to non- scientists through media because a great deal of knowledge and time are necessary to understand the scope of scientific language and media generally restrict the space and time available for the representation of messages. Through a semiotic analyses of programming strategies that present opposing opinions from differing worldviews demonstrate media practices and raise ethical questions about representations that facilitate social discourse affecting society's acceptance of new understandings derived from science. In addition, several key concepts will be addressed that demonstrate how new work in neuroscience support Peirce's semiotic concepts including semiosis, the interpretant, and “law

of mind". During the lectures research works and analysis methodologies able to map the presentation of scientific topics on media and their representation into population. In so doing students will be supported toward the definition of model of scientific knowledge delivering able to favor the commitment of people in embracing the opportunity and the suggestions developed by scientific advancement.

PROGRAM MODULES:
A) Narrative analysis on media representations – 3 hours
B) Neuroscience media communication – 2 hours
C) Bias and cultural interpretation of science in the last decades- 3 hours
D) Perspective on Human machine interaction – 2 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

Final assessment: NO
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14. CASE STUDIES AND SYSTEMATIC REVIEWS

Lecturers: Barbanti, Gennaro
Total number of hours over the entire cycle: 6 hours
Distribution during the PhD programme (years in which the course is offered): 2^ year___**HPSC**
Course description: When used together, systematic review and case studies promote comprehensive, accurate, and useful summaries of empirical evidence to answer questions that are relevant for policy, practice, and future research.
For these reasons, systematic reviews case studies and meta-analysis have become popular tools that are widely used in the social, health, and natural sciences.
The course promotes the analysis of case studies and systematic reviews by students, and it could be basically divided into two parts. In the first part, students will be supported in the critical review of case studies and reviews published in the international literature in order to develop a critical approach both in the methodological analysis and in the identification of theoretical and epistemological criticalities of the relative results achieved.
In the second part of the course the students themselves will be supervised in the developing literature review and/or in the addressing of specific research topics in a scientific perspective. Lectures accompanied by individual and in small groups work will allow students to develop research expertise and autonomy in addressing research topics related to the PhD framework. At the end of the course attendant will be able to develop research studies and publish them into journal according to international scientific standards.

PROGRAM MODULES
A) Critical approach to systematic reviews in psychology - 3 hours
B) From case series to scientific data base and disease registries – 3 hours

Curriculum: HEALTH PSYCHOLOGY AND SCIENCE COMMUNICATION (HPSC)

Final assessment: NO
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Other educational activities (seminars, laboratory and research activities, interdisciplinary, multidisciplinary, and transdisciplinary training).