

PhD Programme in PERSONALIZED MEDICINE AND PUBLIC HEALTH	
DISCIPLINARY SCIENTIFIC AREA	06 - MEDICAL SCIENCES; 02 - PHYSICAL SCIENCES
COORDINATOR	PROF. MASSIMO CLAUDIO FANTINI
HEAD DEPARTMENT	DEPARTMENT OF MEDICAL SCIENCES AND PUBLIC HEALTH
DURATION	3 YEARS
LEARNING OUTCOMES AND RESEARCH TOPICS	<p>The main purpose of modern medicine is to implement preventive and curative interventions aimed at preserving the state of health understood as a state of total physical, mental and social well-being in the absence of disease. However, the implementation of any health intervention, whether of a preventive or therapeutic nature, in an unselected population ("one-fits-all" approach) is characterized by a variable percentage of failure or a percentage of individuals who, despite being subject to the intervention, did not benefit from the desired effect. The negative value of failure together with the share of resources invested to generate it can be considered a measure of the level of inefficiency of the intervention itself.</p> <p>The personalization process in Medicine aims to improve the efficiency of a healthcare intervention in a context of limited resources, through the identification of an individual or patient on the basis of certain characterizing traits, in which the result of the intervention is maximum. Therefore, the personalization process is based on the ability to describe the set of traits characterizing the individual, or phenotype, and on the association of this with the outcome of the intervention.</p> <p>The determination of the phenotype involves the integration of anthropometric, epidemiological and clinical data relating to the characteristics of the disease, with those made available by the evolution of "omics" technologies such as genomics, transcriptomics and metabolomics as well as those relating to exposure to environmental factors.</p> <p>The application of artificial intelligence in the analysis of phenotypic data today makes it possible to generate tools potentially capable of predicting the response to specific therapies or determining the risk of disease in genetically predisposed subjects exposed to specific environmental factors.</p> <p>The programme of the PhD in Personalized Medicine and Public Health offers a training program that is unique in its kind and clearly differentiated from other first and second level study courses which, by integrating the frontal teaching activity of the seminar type with the development of research in the field of personalized medicine, has the objective of training professional researchers with a solid basic knowledge of the pathophysiological mechanisms of aging and non-communicable diseases capable of integrating epidemiological and clinical data with those deriving from multiparametric omics analyzes in order to generate personalization tools in healthcare.</p> <p>In view of the multidisciplinary nature of the topic, the PhD in Personalized Medicine and Public Health is divided into various thematic areas, each of which focuses on specific aspects of personalization in the field of new therapies and prevention in Public Health. Thematic areas include: 1) Personalized Medicine in non-communicable diseases, 2) Personalized Occupational and Environmental Health, 3) Pediatric and transition medicine, 4) Aging and friability, 5) Ethics of personalized medicine in chronic disease and aging.</p> <p>The objective of the PhD in Personalized Medicine and Public Health is to</p>

	<p>train a new type of researcher with solid theoretical training and technical skills aimed at integrating clinical and epidemiological data with those deriving from multiparametric analyzes of the omic type. These researchers will have to be able to develop tools to personalize interventions in the health sector, ranging from the personalization of therapies for specific pathologies to that relating to preventive interventions in the public health sector. This objective will be achieved through the acquisition of a solid knowledge of the techniques applied to the generation and collection of data from various sources, including those of clinical, genetic, biological and environmental derivation, and by the knowledge of a solid analysis methodology. Finally, the knowledge necessary for the generation of decision-making tools based on the application of artificial intelligence will be provided. This knowledge will be acquired during the PhD through the defined program of lectures and seminars on specific topics. These seminars will be held by international and international experts identified by the doctoral board as part of the teaching program envisaged by the doctoral choir.</p> <p>The skills acquired will be applied in research projects developed within the laboratories of the Department of Medical Sciences and Public Health and the University Research Services Center (CeSAR) of the University of Cagliari, within the structures of the University Hospital of Cagliari or in the area as required by the specific project. Individual PhD students will be involved in departmental meetings during which the progress of individual research projects in the various thematic areas will be exposed and compared, paying particular attention to the methodologies used for data generation and analysis and for the development of customization tools. It is also expected that PhD students will present the products of their line of research in the context of national and international congresses and that the end of the PhD course will end with at least one scientific product published in full in peer reviewed journals.</p> <p>The title of Doctor in Personalized Medicine and Public Health will identify a researcher with skills in the clinical and epidemiological fields, in omics technologies and in the analysis and integration of data derived from them aimed at developing tools capable of guiding therapeutic decisions and prevention interventions. It is believed that this profile, unique in its kind due to the specificity of the topic and at the same time due to the breadth of the field of application, will be able to find professional opportunities both in the healthcare system and in the private sector in pharmaceutical or biotechnological companies. In fact, the evident interest in the public and private sectors in the research and development of tools aimed at optimizing both therapeutic and preventive interventions make it necessary to create specific skills. In the pharmaceutical sector, the generation of efficacy and safety data in parallel with the search for specific profiles capable of identifying candidate patients for certain treatments is strongly encouraged by national and international regulatory bodies. In the public sphere, the identification of a certain risk profile as a guide for prevention interventions is the subject of numerous investments. The Doctoral Program in Personalized Medicine and Public Health is structured to provide the professional profile required in this specific field.</p> <p>The wealth of knowledge acquired and the research experience gained in the PhD course will also be able to train a new class of researchers engaged in national and international research institutes and universities within an academic professional path.</p>
<p>ELIGIBILITY AND OTHER REQUIREMENTS FOR CANDIDATES (ART. 2 - NOTICE</p>	<p>LM-6 Biologia LM-9 Biotecnologie mediche, veterinarie e farmaceutiche LM-41 Medicina e chirurgia</p>

OF COMPETITION)	Foreign candidates: degrees equivalent to Medicine and Biology
ADMISSION TESTS	<p>ASSESSMENT OF QUALIFICATIONS AND CURRICULUM VITAE, AND INTERVIEW</p> <p>The interview will aim to ascertain the candidate's ability to orient on the main areas of study inherent in the doctorate and to verify his/her analytical, processing and communication skills.</p> <p>During the interview, a three-year research project proposed by the candidate will be discussed, which must be presented, in addition to the documents required by art. 3 of the call for applications (Annex A "Titoli valutabili e Curriculum Vitae"; Annex B 'Dichiarazione sostitutiva di certificazioni del/i titolo/i di accesso con esami e voti'; two-sided coloured scanned copy of a valid ID, with a clear photo), by uploading it to the system by the call expiry date (file name: research_project_surname_name).</p> <p>Candidates unable, for justified reasons, to take the interview at the established venue, may be granted the possibility of carrying it out by videoconference, on the same date and time established for face-to-face interviews, according to the procedure indicated in the notice of competition.</p>
ADMISSION TESTS FOR FOREIGN CANDIDATES APPLYING FOR RESERVED POSITIONS SUPPORTED BY A SCHOLARSHIP	<p>ASSESSMENT OF QUALIFICATIONS AND CV, AND VIDEO CONFERENCE INTERVIEW</p> <p>During the interview, a three-year research project proposed by the candidate will be discussed, which must be presented, in addition to the documents required by art. 3 of the competition announcement (certificate attesting the award of a 2nd level foreign degree needed to access a PhD programme, including exams and marks, with a translation in Italian or English; certificate attesting the award of a 1st level foreign degree, including exams and marks, with a translation in Italian or English; signed Curriculum Vitae preferably in EU format, in English or Italian; additional qualifications, certifications, publications; copy of a valid passport), by uploading it to the system, by the expiry date of the announcement (file name: research_project_surname_name). The interview can also be conducted in English.</p> <p>Reference letters (up to 3) must be written in English, using the form available on the webpage https://unica.it/dottoraticerca (How to apply for PhD selection: Guidelines and forms- Annex D), by a university professor or an expert in the research fields of the PhD programme, on letterhead of their institution, dated and signed. Evaluators will send their letters directly to the email address phdcall_referenceletter@unica.it (object: surname and name of the candidate being evaluated and name of the PhD programme for which he/she is applying).</p>
POSITIONS	5 (1 of which, with scholarship, reserved for a foreign candidate with a foreign degree)
SCHOLARSHIPS	4: 2 funded by UniCa; 2 funded by Ministerial Decree no. 118/2023: 2 NRRP Research
POSITIONS WITHOUT SCHOLARSHIP	1
CONTACT PERSON	PROF. MASSIMO CLAUDIO FANTINI EMAIL: massimoc.fantini@unica.it TEL: +39 070 675 4621
WEBSITE	https://web.unica.it/unica/it/phd_200_1172.page
SCHOLARSHIPS FUNDED BY MINISTERIAL DECREE NO. 118/2023	
SCHOLARSHIP 1	
TYPOLOGY	NRRP Research
RESEARCH PROJECT	Cardiovascular risk and inflammatory bowel disease: assessment by omics science of metabolites originating from the microbiota and their effects on the cardiovascular system

PRINCIPAL INVESTIGATOR	Prof. Christian Cadeddu Dessalvi
DESCRIPTION OF DOCTORAL TRAINING	The PhD student will have to acquire knowledge aimed at the application of omics sciences in a transversal way. Metabolomics, transcriptomics, genomics and radiomics are recently developing sciences and are proving to be valuable in expanding our pathophysiological knowledge in various clinical contexts. The application capabilities of these sciences are limited to the lack of experience of clinicians with these methods. In the 3 years of studies, the PhD student will learn the use, interpretation and implementation of these methods by learning the advanced statistics methods necessary for the use of "big data" deriving from the use of these techniques. The course will be enriched by a period of study at one of the major European metabolomics centres.
COMPANY/RESEARCH INSTITUTION/PUBLIC ADMINISTRATION	AOU Cagliari Legal head office: Via dell'Ospedale 54, 09124 - Cagliari
NO. OF MONTHS TO BE SPENT IN THE COMPANY/RESEARCH INSTITUTION/PUBLIC ADMINISTRATION	12
FOREIGN INSTITUTION	Rowett Institute, University of Aberdeen Legal head office: Foresterhill, Aberdeen AB25 2ZD, UK Contact person: Prof. Jules Griffin - Director
NO. OF MONTHS TO BE SPENT IN THE FOREIGN INSTITUTION	6
SCHOLARSHIP 2	
TYPOLOGY	NRRP Research
RESEARCH PROJECT	Transforming information into data, data into knowledge for public health
PRINCIPAL INVESTIGATOR	Prof. Angelo Scuteri
DESCRIPTION OF DOCTORAL TRAINING	The general objective (overarching) of this study is to educate health professionals and public administration personnel on the culture of data. The specific objectives of this Doctorate can be schematized and can be mainly traced back to the typologies exemplified below: - to describe and characterize the clinical presentations of age-related pathologies with the highest prevalence and their response to therapy; - identify the most frequent clusters of pathologies requiring hospitalization and evaluate how they change with ageing; - evaluate adherence to the indications of national and international guidelines in clinical practice ("real world") and how they differ by gender; - evaluate the consumption of resources.
COMPANY/RESEARCH INSTITUTION/PUBLIC ADMINISTRATION	SC di Medicina Interna, Azienda Ospedaliera Universitaria (AOU) Cagliari Contact person: Prof. Angelo Scuteri (Director) Legal head office: Via dell'Ospedale n. 54, 09124 Cagliari
NO. OF MONTHS TO BE SPENT IN THE COMPANY/RESEARCH INSTITUTION/PUBLIC ADMINISTRATION	12
FOREIGN INSTITUTION	The foreign institution where the activity will be carried out and the relative contact person will be defined after the conclusion of the selection proceedings.
NO. OF MONTHS TO BE SPENT IN THE FOREIGN INSTITUTION	6