



PhD in Health Sciences

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Doctorate School (Administration and Services Building. First Floor, 1 Don Juan de Austria Street, Burgos)

PRESENTATION

The Doctoral Programme in Health Sciences at the University of Burgos is designed to promote research and train new scientists capable of addressing society's health challenges through evidence-based decision-making. In this regard, the programme integrates all major levels of healthcare.

At the primary and community level, it focuses on health promotion, prevention, and rehabilitation, being the first PhD to include a specific area in Family and Community Care.

The second level involves clinical care in hospitals, where research in various medical specialties fosters scientific advancement, technology transfer, better practices, and research networks. The collaboration between the University and the Hospital Universitario de Burgos enhances translational research, connecting basic science with clinical application to improve patient care.

Finally, given its context, the programme also prioritises research on rare and complex diseases, addressing the challenges of limited knowledge, lack of training, and minimal research networks that often result in delayed diagnosis and inadequate treatment.

- [FAQs about the PhD Programme in Health Sciences](#)

OBJECTIVES

R+D+i in Health Sciences plays an essential role both in the public sector (national, regional and local health administrations) as well as in the private sector. Research with preventive, clinical, and epidemiological objectives constitutes the basic pillar of public health practice. Therefore, students who complete the PhD in Health Sciences will have achieved the following objectives:

- 1.- They will have experience in handling the main research methods in health sciences.
- 2.- They will be capable of developing research projects eligible for funding by national and international agencies.
- 3.- They will possess the necessary competencies to design sophisticated health sciences research studies, develop data collection instruments, coordinate and supervise data collection, and competently manage and analyse a database.
- 4.- They will have written a scientific manuscript suitable for publication in a high-impact journal in health sciences, public health or related fields.
- 5.- They will develop skills and positive attitudes for multidisciplinary teamwork.

RESEARCH AREAS

1. **Clinical, Primary and Community Care.** 11 research groups are included within this research area.
 - a. [Social Inclusion and Quality of Life- \(SIQOL\)](#). This group focuses on risk and protective factors to enhance population health-related quality of life, serving as a tool for healthcare improvements. Its members excel in advanced meta-analytical and multivariate techniques—like structural equations, mediation/moderation analyses, confirmatory factor analysis, and mixed models for longitudinal studies—in areas such as multiple sclerosis, Alzheimer's, cholesterol, and hypertension.
 - b. [Quality of Life in Diversity and Occupational Therapy \(CAVIDITO\)](#). Studies the improvement of quality of life in older people and those with motor disabilities linked to different aetiologies.
 - c. [Data Analysis Techniques Applied in Health Environment Sciences \(DATAHES\)](#). Carries out its research activity in the application of machine learning techniques through the study of the use of active methodologies and the design of computer applications in different contexts such as health sciences.
 - d. [Consolidated Research Unit \(UNIC 348\)](#). Some of its members are also part of the GIR DATAHES. The Unit's research areas focus on research within the field of educational and health psychology through the application of machine learning and artificial intelligence techniques designed to improve learning processes and human behaviour. This work is carried out using integrated multichannel eye-tracking technology [eye tracking, galvanic skin response (GSR) and electroencephalogram (EEG)] as well as biofeedback and virtual reality techniques.



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- e. [Methods and Research Techniques in Social and Health Sciences](#). Applications and Learning (MAYA) focuses on the development and advancement of tools to improve measurement and research in social and health sciences.
- f. [Technology and Occupational Therapy \(TECTO\)](#). TECTO is an interdisciplinary unit that integrates the fields of health sciences and engineering. Its main focus lies in the implementation of technology with the goal of improving health in all its dimensions and across different groups. Among the group's main activities is the analysis of the therapeutic use of virtual reality, including serious games, mobile applications, and peripheral devices such as Kinect, robotic gloves, 3D glasses, etc. Likewise, the group collaborates in the development and validation of applications and assessment tools, and devotes a significant part of its research to the use of additive manufacturing and the design of assistive products.
- g. [Intellectual Disability and Behaviour \(DISCONDU\)](#). DISCONDU is composed of various researchers and professionals who carry out their work at the university or in public and private institutions in the Autonomous Community of Castilla y León. Currently it is exploring the following research areas: Syndromes that involve intellectual disability, adaptive skills in people with intellectual disability, adaptation of the AAIDD's ABS scales, diversity and behaviour, adaptation, violent behaviour, xenophobia, behavior and older adults, healthy ageing, family and tutorial guidance, training and employment, addictions and new technologies, social research techniques and data analysis, and social mental health.
- h. [Advanced Research in Integrative Physiology for Life \(IAFIV\)](#). This is an interdisciplinary group studying the possible effects of nutritional supplements and/or physical exercise on various physiological factors in different population groups, with the aim of improving their quality of life.
- i. [Evaluation, Clinic and Health](#). This research team from the Universidad de Deusto fundamentally develops its work in two research areas. One focuses on the evaluation of outcomes in health/disease processes, and a second focuses on the development of evaluation instruments and methodologies in health settings.
- j. [Research Methods and Techniques in Social and Health Sciences: Applications and Learning](#). The main areas of expertise of this group from the Universidad de Huelva are: attitudes toward research methodology courses among social science students, applications for teaching in research methodology courses, construction of psychological and educational tests, design of assessments in clinical psychology, research on drug use and addictions, research on lifestyles in childhood and adolescence, and research methodology in social and health sciences.
- k. [Centre for Advanced Studies Research \(CIEAM\) of the Vice-Rectorate for Research and Graduate Studies at the Catholic Universidad de Maule \(UCM\), Chile](#). Some of the research areas developed by this group are: intercultural communication in health institutions, and different psychosocial risk factors as well as psycho-affective and psycho-cultural aspects in organisations. Their research includes topics such as the construction of professional identity among nurses, analysis of clinical evaluations among physicians, the joint construction of narratives in the doctor-patient interview, and geo-narratives of psychological well-being.

In addition to these university-based groups, the research areas includes 14 PhD researchers belonging to the Hospital de Burgos (HUBU) and the Primary Care Services (SACYL) of Castilla y León, whose research areas address different aspects of clinical practice such as allergology, digestive pathology, neurology, obstetrics and gynaecology, oncology, paediatrics, and intensive medicine, among others.

2. **Bioinformatics and Resource Optimisation.** Within this area, the programme includes 4 research topics:
 - a. [Advanced Data Mining Research and Bioinformatics Learning \(ADMIRABLE\)](#). Its research focuses on the design of new machine learning algorithms applied to solving different types of problems, such as those related to the fields of life and health sciences. In addition, they research gene structure prediction using evolutionary computing techniques. They also have experience in configuring workflows in Galaxy (<https://usegalaxy.org>), one of the most widely used computational biology tools for genetic sequence assembly.
 - b. [Biology, Education and Health with Advanced Computer Technologies \(BEST-AI\)](#). This research group specialises in modelling solutions based on the analysis of large datasets, mainly of biological, medical, environmental, or educational origin, and in the use of classification, regression, and clustering techniques to solve problems that provide value in transforming healthcare, the environment, or education.
 - c. [Consolidated Research Unit UIC 170 – Computer Science](#)



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- d. [Paleoneurology Group from the National Centre for Research on Human Evolution GENIEH](#). It develops experimental research areas on the relationship between the brain and skull, on methods of digital anatomy and computerised morphometry, and on brain metabolism and craniovascular traits. The metabolic and vascular studies include the anatomy and morphology of vessels under normal and pathological conditions, intracranial thermal management and the relationship between the vascular system, thermoregulation and neurodegeneration. It also focuses on the analysis of the human dental apparatus and mastication through studies of classical morphometry such as 2D and 3D analyses using techniques such as micro-computed axial tomography (μ CT scan) of enamel, dentine, and the pulp cavity.

3. **Molecular Research.** 3 teams are currently involved in this area:

- a. [Pathophysiology of Diabetes, Obesity and their Therapeutic Education \(DIABO-TER\)](#). This biomedical research group addresses two major challenges: the progressive ageing of the population, which inevitably comes with the development of metabolic and neurodegenerative diseases such as diabetes mellitus (DM) and Alzheimer's disease (AD); and the obesity epidemic, which is a risk factor for the development of metabolic and cardiovascular diseases. This research group employs different methodological approaches (in vitro, ex vivo and in vivo) to study insulin resistance and the metabolic alterations underlying both pathologies, with the aim of developing new drugs.
- b. [Consolidated Research Unit UIC 160](#) and [Bioorganic Research Group](#). Focused on the study and development of organic compounds with applications in biomedicine. In particular, they analyse the design and evaluation of compounds capable of facilitating the transport of anions across lipid membranes. Their studies assess their application as chemotherapeutic agents in the treatment of cancer and diseases related to defects in ion transport at the cellular level, such as cystic fibrosis.
- c. [Consolidated Research Unit UIC 271 – Microbiology](#)
- d. [Microbiology, "One Health" \(OHM\)](#). The OHM research group is composed of researchers from the area of microbiology at the Universidad de Burgos and national and international experts in the field, who develop an integrated "One Health" approach (one medicine, one health) for the study of fundamental aspects in the control of zoonotic pathogens, ranging from primary production, food processing and distribution, to the hospital environment.
- e. **Pathophysiology of Metabolic Diseases**. This research group, led by Germán Perdomo Hernández of the Consejo Superior de Investigaciones Científicas (CSIC), studies diabetes and obesity (metabolic diseases), two major epidemics of the 21st century that represent a significant global public health problem.
- f. [Calcium and Cellular Function of the Universidad de Valladolid](#). This group addresses structural, physiological and pathophysiological studies organised into three major general objectives: 1) methodological developments and the generation of new tools. The aim is to generate vectors for selective expression in specific cell types (neurons, glia and pancreatic cells) and new transgenic animal lines, both fly and mouse. In collaboration with other researchers, they intend to carry out structural and mechanistic studies around the GAP-Ca²⁺ interaction; 2) the study of Ca²⁺ homeostasis in the endoplasmic reticulum (ER) and its relationship with different physiological functions. In collaboration with other laboratories, they propose a search for the ER leak channel based on comparative physiology and evolutionary genetics. They also plan to study the participation of the ER in several physiological functions (hormone secretion, glial and retinal oscillations, and activation of sensory neurons), and 3) the study of possible alterations in Ca²⁺ homeostasis in the ER and Golgi in different ageing models (neurons and glia), both in vitro and in vivo. They will compare Ca²⁺ levels in young and old cells, both in the steady state in the ER, as well as Ca²⁺ pumping and passive release.
- g. [GHEPI \(Global Health and Emerging Pathogens Institute\)](#). The Instituto de Salud Global y Patógenos Emergentes is the nucleus of the Icahn School of Medicine at Mount Sinai's work on infectious diseases and the pathogens that cause them. The Institute builds on the School's internationally recognized expertise in RNA virus research and encompasses ongoing research on the molecular pathogenesis and host responses of influenza, HIV, Dengue, Zika, Ebola, and other emerging and re-emerging virus infections.



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ADMISSION CRITERIA

The Doctoral Programme in Health Sciences offers a maximum of 15 places per academic year (14 in its initial implementation). The Programme Committee may increase this number as additional researchers join the programme, provided that the maximum number of these each supervisor can oversee simultaneously is respected, and subject to prior formal authorization.

→ DIRECT ADMISSION

Applicants will be granted direct access if they:

- Hold qualifications that previously provided access to other doctoral programmes in Health Sciences and have obtained the Diploma de Estudios Avanzados (DEA) in accordance with Royal Decree 778/98, or the Research Proficiency Certificate according to Royal Decree 185/85.
- Possess an equivalent qualification, as approved by the Academic Committee.
- Have undertaken at least 2 years of positively assessed training in a specialised health training programme (MIR, EIR, etc.) leading to an official qualification in Health Sciences.

→ ADMISSION REQUIRING ADDITIONAL TRAINING

Applicants must undertake additional coursework if they:

- 1) Hold a Master's degree in related area with at least 16 ECTS credits in research methodology and have completed a research-based Master's thesis.
- 2) Meet the general doctoral access requirements but do not fall within the categories above.

→ SELECTION CRITERIA (when applications exceed available places):

- ≡ Type of qualifications granting access
- ≡ Professional or training links with the University Hospital of Burgos
- ≡ Academic transcript and professional experience

Priority will be given to applicants who:

1. Possess scientific knowledge and technical skills applicable to biomedical and health sciences (graduates in Medicine, Nursing, Physiotherapy, Psychology, Biology, Biotechnology, Pharmacy, Veterinary Medicine, etc.)
2. Have completed the Master's Degree in Health Sciences: Research and New Challenges or another research-oriented master's degree in a related field.
3. Have undertaken specialised health training (MIR, EIR, BIR, FIR, QIR, PIR or RFIR)
4. Can demonstrate English proficiency at level B1 of the Common European Framework or Reference for Languages (CEFR) and, in the case of foreign students, Spanish proficiency at level B2.
5. Present a strong academic record, high Master's thesis grade, and a positive evaluation report from their thesis supervisor regarding research potential.
6. Provide evidence of research achievements, such as publications or conference contributions.

The ideal candidate will have an academic background in biomedical or health-related disciplines, a strong research interest, and a master's degree in a related area. They should demonstrate competencies in instrumentation handling, qualitative and quantitative research methods, data analysis and presentation, and possess good interpersonal and teamwork skills.

PROFESSIONAL OUTCOMES

The Doctoral degree corresponds to the third cycle of university studies and constitutes the highest academic qualification attainable in terms of formal education.

Obtaining a PhD is not only valuable for those wishing to pursue an academic career, but also for facilitating integration into the professional sector, by training doctoral graduates in the generation and dissemination of research, development and innovation. The aim is for those who reach this level of training to play a key role in all institutions involved in innovation and research, both public and private.



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One area of particular interest for prospective doctoral candidates lies in the numerous public health research bodies that periodically offer positions for senior scientists, whose main requirement is sound training in research methods in the Health Sciences.

The purpose of this programme is to provide doctoral students with a comprehensive professional research network capable of meeting the highest academic and professional standards, creating a system of knowledge, research and innovation that helps future doctors integrate into the scientific and labour markets. To this end, it promotes the establishment of links with research groups, business sectors committed to high-quality training, institutions, and other R&D&I organisations.

Consequently, graduates from this doctoral programme will have increased opportunities to work in various services within hospitals, primary and social healthcare centres, applied research institutes, healthcare planning and evaluation bodies, public health agencies, private companies in the health sector, and international organisations.

