

COURSE 2024-2025

# University Master's Degree in Research in Dentistry



## University Master's Degree in Research in Dentistry 2024-2025



AQU Catalunya registered on EQAR

### Introduction

The University Master's Degree in Research in Dentistry at UIC Barcelona (Spain) offers a blended learning approach to structured training for research in academic, industrial and clinical settings.

The UIC Barcelona Faculty of Dentistry is continuously making progress in the field of basic and applied research, seeking results through clinical responses to improve the efficiency of materials and techniques.

This master's programme aims to enhance participants' research knowledge and prepare them for doctoral studies through a series of advanced training topics in the different dental specialisations.

UIC Barcelona provides the ideal setting for this kind of advanced training in Research in Dentistry due to several factors: the numerous lines of research explored by the different departments in the UIC Barcelona Faculty of Dentistry, the close relationship with the dental and pharmaceutical industry as regards project implementation and our fully equipped research laboratories.

### Organising Department

Department of Research  
Faculty of Dentistry

### Chairman

Dr Marta Satorres Nieto

### Programme Director

Dr Marta Satorres Nieto

### Coordinator

Dr Oscar Salomó

### Academic Board

Dr Ignasi Belda, Dr Begoña Bosch, Dr Jordi Cano, Dr Rut Fadó, Dr Natalia Felipe, Dr Estel Gil, Dr Lluís Giner, Dr Adrián González, Dr Josep Maria Huguet, Dr Mark A. Lodge, Dr María José Martínez, Dr Jordi Mas, Dr. Lluís Giner, Dr. Ignacio McPherson, Dr Joan Marc Martínez, Dr Carla Mura, Dr Antoni Parada, Dr Oscar Salomó, Dr Lissethe Peñate, Dr Mariana Ponte, Dr Laura Sánchez Garcia.

## Objectives

The main aim of the University Master's Degree in Research in Dentistry is to provide the knowledge and tools needed to pursue a doctoral programme in the field of oral health, following a methodology based on ethics and scientific evidence.

To achieve this, the course will:

- Provide students with the knowledge and skills necessary to produce effective clinical and research materials in the field of dentistry.
- Promote the acquisition of skills, attitudes and behaviours that facilitate scientific interaction with the environment to adequately solve research problems.
- Promote research in dentistry and continuing education for the study of new techniques and improvements in the dental profession.
- Provide the necessary tools to work together and coordinate multidisciplinary projects.

Other complementary objectives:

- To train students to be experts in scientific method, capable of planning, executing and interpreting the results of research projects, taking into account economic, regulatory, legal, ethical and humanitarian aspects.
- To train students to be experts in the molecular basis of diagnosis and the treatment of the most common diseases in the field of dentistry.
- To enable students to develop a solid foundation in the use of methodological and instrumental research techniques, facilitating contributions to research in both public and private laboratories.
- To give the option of complementing clinical training with a solid background in research.

## Skills

The general and specific skills that students should acquire while completing the University Master's Degree in Research in Dentistry at UIC Barcelona encompass the principles contained in Article 3.5 of Royal Decree 1393/2007, of 29 October, on respect for basic rights, equal opportunities and universal access for men, women and people with disabilities, while promoting a culture of peace and democratic values.

### Basic skills

- Knowledge and understanding that provide a foundation or opportunity for originality in developing and/or applying ideas in a research context.
- Applying the knowledge acquired, and developing problem-solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the field of study.
- Integrating knowledge and handling complexity, in addition to formulating ideas based on scientific evidence, using information that may be incomplete or limited, while considering the social and ethical responsibilities linked to the application of their knowledge and judgements.
- Being able to communicate conclusions to specialists and non-specialists alike in a clear and unambiguous manner, with supporting knowledge and rationale.
- To acquire learning skills that enable ongoing independent study.

### **General skills**

- Ability to integrate new knowledge through research and study, and deal with complexity.
- Capacity for critical analysis and discussion of experimental results and ability to draw the corresponding conclusions.
- Self-learning capability in the development of analytical techniques for the acquisition of new scientific concepts, and in the search for new scientific information.
- Ability to argue and defend own scientific ideas and to listen, analyse, evaluate and respond to the ideas of others.

### **Specific skills**

- Ability to apply scientific method, experimental design and biostatistics to solve a question or hypothesis.
- Knowing how to use and apply the most common laboratory techniques in the fields of molecular, genomic and proteomic biology, biomaterials, cell and tissue cultures, immunology and microscopy in the field of dentistry.
- Knowing how to apply bioinformatics tools used in basic research.
- Applying experimental animal models as well as the methodology of animal handling and ethical research concepts in dentistry.
- To communicate research results in a scientific article, poster or oral presentation, both in scientific and academic format.
- Learning to manage the financial and human resources of a research project and knowing the strategic framework for transferring knowledge to a company or industry.
- Knowing how to interpret images obtained through the latest technology applicable to research in dentistry.
- Being able to apply the appropriate diagnostic tests and interpret the results.
- Applying the latest dental research technology, considering its properties, indications, biocompatibility, toxicity and environmental impact.
- Knowing how to execute epistemological, ethical, humane and compliant activities in research and the dissemination of results.

## **Course Programme**

### **Theoretical Programme**

We will analyse and critically discuss classic and modern literature through seminars on the following topics: The University Master's Degree in Research in Dentistry at UIC Barcelona is structured into 60 ECTS over one academic year, during which time students will acquire the skills required for clinical and basic research applied to Dentistry and other Health Sciences. In addition, students will take an in-depth look at concepts related to their Final Master's Degree Project (TFM) (Protocol, TFM I and TFM II), to achieve greater specialisation in applied basic and clinical research.

As this is a blended learning course, students will may follow the theory classes and take part in various activities via the online platform. Lectures that have a practical element and the final oral presentation of the TFM will be condensed into two weeks (second and third week of July). This is when students will be required to present their research projects. The main language of communication will be English.

The Master's programme is divided into three modules:

### **Module 1: Evidence-based methodology**

This module consists of obligatory subjects with scientific content and methodologies. Students will acquire a statistical basis for appropriate experiment design, learn to systematically search for scientific information, learn about the phases of research and about the presentation and communication of scientific results. This module will prepare students to deal with issues related to human research, the animal testing laboratory and ethical practices, while ensuring regulatory compliance. In addition, students will learn how to manage human and material resources for research and the transfer of knowledge to industry.

### **Module 2: Research tools in dentistry**

This module consists of two obligatory subjects. It will provide the basis for the Final Master's Project in a line of work established by the Faculty of Dentistry. Students will take a more in-depth look at clinical concepts of molecular biology, regenerative medicine or materials relating to this area of knowledge.

In addition to receiving comprehensive training in the area of research, it is important that the students attend and actively participate in scientific conferences in their field of interest to encourage the transfer of knowledge to the rest of the scientific community.

### **Module 3: Final Master's Degree Project**

This module integrates and evaluates most of the skills and competencies necessary to develop research and continue onto a doctoral programme.

Students will, under the guidance of a tutor, design a research project leading to a final project, through which they will develop methodological skills that will enable them to carry out the practical part of the research, draw up the research report and present the results of the final project.

In addition, the tutor will ensure the student carries out the research in accordance with the guidelines of the Scientific Commission and the Ethics Committee for Clinical Research, with methodological rigour, a critical analysis of the findings and conclusions.

## **Curriculum**

### **Scientific methodology**

Research methodology  
Basic biostatistics  
Bibliographic research  
Advanced biostatistics

### **Scientific communication**

Scientific communication I  
Scientific communication II  
Advanced scientific communication

### **Research ethics**

Principles of bioethics

### **Research management**

Industry-university knowledge transfer  
Search for Research Resources  
Legislation and biobanks

### **Advanced research techniques applied to dentistry**

Basic microbiology  
Animal experimentation  
Scientific contributions I  
Scientific contributions II  
Basic pharmacology  
Basic molecular biology

### **Clinical, laboratory and experimental research**

Experimental techniques  
Epidemiology, public health and qualitative methodology  
Molecular and cellular pathology  
Design of Clinical studies and trials design  
Pre-clinical and clinical pharmacology  
Bioinformatics

### **Research Protocol**

**Final Master's Degree Research Project I**

**Final Master's Degree Research Project II**

## **Methodology and evaluation**

The evaluation of this Master will be based on continuous assessment in all subjects, resolution of cases and the final exam. In all subjects, students must present the exercises, cases and work carried out to the tutor to make this evaluation.

Students will work independently for approximately 300 hours/semester.

Lectures will be given online using the Moodle platform, version 3.4. This platform, which is used at a large number of national, European and international universities, provides the necessary tools to make the most of online learning. Some of the most relevant tools and services of the Moodle 3.4 platform are:

- Tutors may post subject content so that students can watch and listen to it as many times as necessary in a given period, and according to the characteristics of each subject (difficulty, number of ECTS credits, etc.).
- Notes and documents may be posted for students with a password, which will be linked to the academic access codes once the student has completed the enrolment process.
- Student participation may be tracked and objectively assessed for each subject under evaluation. This represents 10% of the final evaluation.
- Participants may engage in debate and discussion on issues raised by the tutor through discussion forums.
- Students may communicate via chat, and information will be updated in real time.
- Videos may be streamed on the platform to give students a channel for audiovisual and dynamic learning.
- The language of communication between teachers and students may be pre-established, in which case the student cannot choose the language based on their preferences. In this case, the language of the platform is English.

## **Faculty of Dentistry Research Lines**

The official research lines of the UIC Barcelona Faculty of Dentistry are indicative of the importance of training dentists who have research skills and know how to use scientific methodology. The master's students will acquire the knowledge and methodology necessary to take part in any research project.

Each student will be asked to state their research areas of interest, and a topic and mentor will be assigned by the master's programme management and coordination team.

## **Admissions process**

To be admitted to this official Master you must hold a bachelor's degree, an undergraduate degree, a diploma or a qualification as an engineer or architect, in accordance with Article 16 of Royal Decree 1393/2007, amended by Royal Decree 861/2010, of 2 July, in the specific area of knowledge.

## **Recommended profile**

All applicants who meet the general requirements may undertake the programme.

However, we recommend that applicants have the following profile:

- Degree in Dentistry, Medicine, Biology, Biochemistry, Biotechnology, Pharmacy, Chemistry, Biochemistry or Veterinary Science or any other discipline in the field of Health Sciences.
- A level of English equivalent to B2.
- A vocation for science and research.
- Quick decision-making skills.
- Discipline, good memory and work ethic.
- Sense of responsibility and integrity.
- Sensitivity and empathy with other people's pain.
- Observant.
- Ability to work as a team.

In addition to the entrance exams and the required documents, the following aspects will be taken into account during the application process:

1. The average mark from the applicant's academic record.
2. Assessment of the applicant's curriculum vitae. Professional experience and previous research, participation in conferences and participation in research projects will be taken into account.
3. An oral and written academic English level test. Applicants from English-speaking countries or who have an official certificate are not required to take this test. The English level test will be evaluated by the Institute for Multilingualism at UIC Barcelona. This oral and written test will be based on knowledge at a First Certificate level and focused on the description and/or analysis of scientific knowledge in the field of Health Sciences.
4. Applicants must undergo a personal interview (or via skype), in which their interest and motivation will be assessed.

Applicants will be informed of the admissions requirements and the required documentation by the secretary of the Faculty of Dentistry and on the UIC Barcelona website.



## **Facilities**

At UIC Barcelona, clinical practices with real patients are fundamental in training high-level professionals.

The UIC Barcelona Faculty of Dentistry has state-of-the-art digital equipment that brings students close to the reality of day-to-day life and prepares them in all theoretical and practical aspects of working in a clinic in the safest and most professional way.

We currently have the following facilities available:

The UIC Barcelona University Dental Clinic has 88 dental booths, all of which are equipped with the most cutting-edge technology: 88 booths for general care, 4 booths for special needs patients and 16 booths for surgery and conscious sedation

The Clinic attended around 75,000 appointments in the last academic year.

The Clinic has two prosthetics laboratories with the latest digital imaging technology, which allows students to practice the latest techniques in all areas of dentistry.

The Faculty has a dedicated CAD CAM technology laboratory with the following equipment:

- Four milling machines:
- 13 intraoral scanners (four 3Shape, one 3M, one Cerec Omnicam, two PrimeScan, one Itero, two Carestream, one Medit, one Shinning)
- Three 3D printers
- Design software: nine Exocad, eleven 3shape and two Cerec
- Four Exoplan, one Geomagic, one BlueSky
- One ceramic furnace
- One zirconia sintering furnace
- 2cbct and 1iCat
- One Teckscan
- One SDI Matrix

All dental equipment is fitted with intraoral radiology for additional testing. The centre has two diagnostic imaging rooms for panoramic dental X-rays with two CBCT. 3D iCat imaging machines.

Digital technology and prosthetic-implant planning software programs allow students to learn and work with the latest technologies from day one. We have a design room with 14 computers (CAD) and a new CAM lab (milling machines, printers) for student training.

- Option to stream dentistry treatment live
- Computerized storage for material delivery and collection
- Sterilisation service for medical equipment and instruments

All the resources are current, and the University has agreements with different industries in the sector, thus promoting the relationship between the industry, universities and R+D+I.

The technology available to our students helps them gain awareness of the daily reality at a clinic and for preparing in all theoretical and practical aspects of working at a clinic in the safest and most professional way.

We have six new laboratories, one of which is dedicated to dental research.

We have eight Zeiss Extaro and Zemax OMS 2360 high-resolution microscopes.

Pre-clinical laboratory, a technological laboratory, has 95 dental simulators, with phantom head models, which are oral cavity simulation tools, and X-ray and digital radiology equipment for practising dentistry using

the Simudont virtual reality simulators. This step introduces virtual reality in the student's pre-clinical practicums, enhancing their learning experience and it is also a great tool as a new teaching methodology. It is a step forward in innovation and improvement in student training. This new laboratory allows students to practice real-life-like dentistry before they practice on patients.

**Places in classrooms:**

2,355 places in classrooms  
88 places in clinics (dentistry booths)  
192 places in gyms  
120 places in IT classrooms  
420 places in laboratories  
415 m<sup>2</sup> of laboratory space dedicated to research

**Places in study rooms:**

361 seminars, multifunctional rooms and a library study room

**Places in Libraries:**

The Library on our Sant Cugat campus measures 1,201.53 metres squared.  
374 reading places throughout the library and three study rooms

## **Basic information**

### **Calendar**

September 2024 to July 2025

### **Timetable**

On-site part: 2 weeks on July  
Monday to Friday, 9 a.m. to 7 p.m.

### **Pre-registration date**

From January 2024

### **Fees**

€10,934\*

*\*Annual registration fees are included in the cost (€494/year).*

### **Places available**

There are 15 places available

### **Accreditation**

60 ECTS, University Master's Degree in Research in Dentistry

### Documentation required for pre-registration

To start the admission process, you must fill in the program's admission form which can be found on the university's website ([www.uic.es/dentistry](http://www.uic.es/dentistry)), and submit all the required documentation:

- Bachelor's degree\*
- Academic transcript of grades\*
- ID or Passport
- Curriculum Vitae
- Signed document with general terms and conditions
- Letters of recommendation (recommended, not compulsory)

\*For students from outside the European Union, both their qualifications and their degree qualification must be attested via the diplomatic route or carry a Hague Apostille stamp. (The degree qualification does not need to have been officially homologated).

Candidates who are in the last year of their degree program must provide a list of the qualifications they have obtained up until the date they register.

\*\*Not reimbursable for administration fees.

Once all documentation has been received and checked for validity, you must pay the registration fee (€90\*\*) and send the payment receipt sent by mail to: [infodonto@uic.es](mailto:infodonto@uic.es) (UIC Barcelona graduate alumni are exempt from this fee).

### Contact:

Paola Lago  
Marta Utset  
[infodonto@uic.es](mailto:infodonto@uic.es)

Faculty of Dentistry  
Universitat Internacional de Catalunya  
Hospital General Building  
C/ Josep Trueta, s/n  
08195 Sant Cugat del Vallès (Barcelona)