

University Master's Degree in Research in Dentistry

University Master's Degree in Research in Dentistry 2022-2023



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 Jordi Cano, Dr Rut Fadó, Dr Natalia Felipe, Dr Estel Gil, Dr Adrián González, Dr Josep Maria Huguet, Dr Mark Anthony Lodge, Dr María José Martínez, Dr Jordi Mas, Dr. Lluís Giner, Dr. Ignacio McPherson, Dr Carla Mura, Dr Antoni Parada, Dr Lissethe Peñate, Dr Mariana Ponte, Dr Luis Antonio Ruiz.

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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.

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- 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.

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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 (80% English, 20% Spanish): all lectures will be in English, and the 20% in Spanish corresponds to e-mail communication between mentors and students while developing the Protocol and TFM, if the mentor prefers to use this language.

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.

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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
Animal and human bioethics

Research management

Industry-university knowledge transfer
Resources for research
Legislation and biobanks

Universitat Internacional de Catalunya
Faculty of Dentistry

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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

Clinical studies and trials design

Pre-clinical and clinical pharmacology

Bioinformatics

Final Master's Degree Research Project I

Research project

Final Master's Degree Research Project II

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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 audio-visual 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.

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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

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Facilities

UIC Barcelona believes that clinical practice on patients is crucial for training high-level professionals. The differentiation of our programs is marked by practice on patients.

The University Dental Clinic has 88 dental boxes, all of them equipped with state-of-the-art dental technology: 88 generalist booths, including 4 booths used for special patient care and 16 booths for surgeries and for conscious sedation.

The University Dental Clinic made approximately 82.000 visits in the last year.

The Clinic has two prosthetic dental laboratories, with the most up-to-date CAD/CAM units that allow students to apply the latest techniques in all areas of dentistry.

The equipment that this laboratory includes are:

- 4 milling machines: Lyra, Cerec, Roland and VHF K5
- 11 intraoral scanners (2 Carestream and 2 Trio Move), 1 Cerec yielded by Henry Schein, 1 3M yielded by 3M, 1 Trios 3Shape yielded by ETK Implants Iberia, 1 Trios 3Shape by Straumann, 1 Primescan by Dentsply, 1 Medit by Klockner and 1 Itero by Align.
- 1 3D printer
- 6 exocad design programs, 1 of 3shape and 2 of Cerec.

We have created **6 new laboratories**, one of them focused on dental research.

1 pre-clinical laboratory with **95 training simulators** and **digital radiology**. This facility allows students to train with augmented reality techniques before treating patients. With this step, virtual reality is introduced into the preclinical practices of students, helping to improve their training and it is also a great tool as a new teaching methodology. It is one more step in the innovation and improvement of the training of students. We also have a scanner and digital printer in the same laboratory.

UIC Barcelona also has 1 dental research laboratory.

2 diagnostic imaging rooms for taking panoramic dental X-rays and latero-lateral and posterior-anterior teleradiographies, periapical radiographs and CBCT scans.

Digital technology and implant-prosthetic planning programs allow students to train and work from the beginning with the latest technologies.

- Possibility of broadcasting dental interventions live.
- Smart storage room for delivery and collection of material.
- Sterilization unit for medical materials and instruments.

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All resources are up-to-date and the university has agreements with different industries in the sector, thus strengthening ties between industry, universities and RDI.

The technology available to our students brings them closer to the reality of the day to day and prepares the student in all theoretical and practical aspects to be able to work in the clinic with maximum safety and professionalism.

We also have dentistry management software to keep track of students' and patients' progress. We have 6 endodontic microscopes (Zeiss and Zumax)

Places in classrooms

2,355 places in the classrooms
88 places in the Clinic (dentistry booths)
192 places in gyms
120 places in IT classrooms
420 places in laboratories
415 m2 of laboratory facilities 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 meters squared.
402 places for reading across the Library and three study rooms.

Universitat Internacional de Catalunya
Faculty of Dentistry

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Basic information

Calendar

September 2022 to July 2023

Timetable

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

Pre-registration date

From January 2022

Fees

€10,320*

**Annual registration fees are included in the cost (€480/year). The annual registration fee has not yet been approved by the University's Board of Governors.*

Places available

There are 15 places available.

Accreditation

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

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Documentation required for pre-registration

- A filled-in pre-registration form
- 1 attested copy of the corresponding degree qualification (with an original stamp).*
- 1 Academic Certificate of qualifications (original or attested photocopy).*
- A photocopy of your national ID card (DNI) or passport.
- Payment of €90** and payment receipt sent by mail. (Except for former UIC Barcelona degree students).
- Copy of CV listing courses and conferences attended.
- 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 programme must provide a list of the qualifications they have obtained up until the date they register.

**Not reimbursable for administration fees.

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