



UNIVERSIDAD
DE ALMERÍA

Diabetes 360°: Boot Camp on Scientific Research Skills & Applied Methodologies in Diabetes

JULY 13 - JULY 17 | 3 ECTS | 20 HOURS



A SEA OF KNOWLEDGE
STUDY ABROAD

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Introduction

Diabetes mellitus represents one of the most significant global health challenges due to its high prevalence, complex pathophysiology, and the wide range of preventive and therapeutic strategies currently under investigation. Its multifactorial nature makes diabetes an excellent model for teaching scientific methodology in the health sciences. Training future health professionals in critical thinking, research design, and data interpretation is essential to advance prevention strategies, improve clinical care, and foster innovation in chronic disease management.

The course Diabetes 360°: Scientific Research Skills and Applied Methodologies in Diabetes offers international health science students an intensive one-week training focused on developing core research competencies using diabetes as a model condition. Participants will learn how to formulate research questions, conduct structured literature searches, critically appraise scientific evidence, interpret data, and collaboratively design a supervised mini research project. The program is designed for students with no prior research experience, offering a guided and progressive introduction to scientific work.

Through short lectures combined with laboratory visits, simulation scenarios, and structured small-group research activities, the program fosters scientific reasoning and applied research skills while reinforcing transversal competences such as teamwork, communication, problem-solving, adaptability, and autonomous learning. All practical components are framed within a translational perspective, connecting bench research, clinical prevention, and population health. Teaching is delivered by an interdisciplinary academic team spanning medicine, nursing, nutrition, biochemistry, physiology, epidemiology, and public health.

By the end of the course, students will have acquired transferable research skills applicable across health-related disciplines, gained experience working in international and interdisciplinary teams, and produced a complete mini research project suitable for academic presentation.

Coordinators

María del Mar López Rodríguez

Tiago Jerónimo Dos Santos

Tania Romacho

Main goals

- Understand fundamental principles of scientific methodology in health sciences.
- Analyze and interpret diabetes-related data using basic descriptive and research-oriented approaches.
- Perform efficient bibliographic searches and critically evaluate scientific literature.
- Collaborate in interdisciplinary teams to develop a mini research project.
- Formulate relevant research questions and design a basic study protocol in diabetes.
- Communicate scientific results orally and in writing following academic standards.

Contents

Module A: Introduction to scientific research in health

Objective:

To provide students with foundational principles of scientific methodology and evidence-based reasoning, using diabetes as a model condition.

Content:

- What constitutes a research question.
- Main types of study designs in health sciences.
- Structure of a scientific article.
- Principles of critical thinking and evidence-based medicine.
- Introduction to scientific literature searching and appraisal.

Activities:

- Group formation and initial brainstorming for the mini-project.
- Identifying research questions from real cases.
- Hands-on guided search using PubMed, MeSH terms, and filters.
- Critical appraisal (validity, bias, limitations, applicability).
- Hierarchy of scientific evidence.
- Identification of knowledge gaps to define the mini-project research question.

Module B: Diabetes as a model for biomedical research

Objective:

Use diabetes as a real-world model to understand how clinical problems translate into research questions and preventive strategies.

Content:

- Essential concepts in type 1 and type 2 diabetes.
- Risk factors, progression, and complications.
- Emerging research areas: biomarkers, prevention, epidemiology, public health.
- Example of a clinical registry in diabetes.

Activities:

- Critical review of recent trials (ADA, ISPAD, EASD).
- Converting clinical problems into research questions.
- Group work to refine the scope and objectives of the mini-project.
- Breakthrough T1D virtual session (<https://www.breakthrough1d.org/>)

Module C: Simulation scenario. Multidisciplinary & role-based approach

Objective:

To expose students to real-world diabetes prevention and screening scenarios and early intervention through a structured simulation scenario while highlighting the complementary roles of different health professionals.

Content:

- Identification of individuals at risk of Type 1 diabetes
- Interpretation of screening and laboratory data (clinical, biochemical, and risk-assessment tools).
- Preventive strategies from different professional perspectives.
- Ethical considerations and patient-centred communication.
- Integration of clinical findings with research evidence.

Activities:

- Simulation classroom where each participant will assume a role aligned with their academic background (medical student, nurse, dietitian, other health science student), emphasizing how different disciplines contribute to prevention strategies and research design.
- The simulation is facilitated by faculty and followed by debriefing.

Module D: Laboratory-based activity. Experimental foundations of diabetes research

Objective:

To introduce students to the biological and experimental basis of diabetes research.

Content:

- Overview of experimental models and biomarkers used in diabetes research.
- Role of laboratory data in prevention and early detection strategies.
- Overview of how laboratory findings inform clinical practice, epidemiology, and research projects

Activities (demonstration-based):

- Guided laboratory visit (demonstration-based): translational research laboratory at the University of Almería, where researchers will demonstrate how experimental and molecular markers are generated, analyzed, and interpreted in the context of diabetes prevention and complications ("from bench to bedside").

- Guided visit to an external clinical laboratory (subject to institutional permissions), focusing on how laboratory data are integrated into routine clinical decision-making.

Module E: Development of the mini-research project & scientific communication

Objective:

Guide students through the full process of preparing and presenting a scientific project.

Content:

- Writing objectives, hypotheses, and methodology.
- Study design structure.
- Abstract writing.
- Slide preparation and oral presentation techniques.

Activities:

- Small-group tutorial sessions.
- Poster or oral presentation preparation.
- Final mini-conference with faculty feedback.

Course methodology

The course employs an active, student-centered methodology designed to build research skills progressively from foundational knowledge to the completion of a mini research project. First two teaching days are structured around short expert lectures (approximately 2 hours) followed by extended practical and small-group research activities (approximately 3 hours). Teaching will be delivered through a combination of lectures, practical workshops, case-based scenarios, and collaborative activities. Third and fourth days are focused on practical assignments like simulation case-scenarios and lab visits.

Introductory lectures delivered by experts in endocrinology, nutrition, physiology, nursing, and biomedical sciences provide essential conceptual grounding in diabetes, prevention strategies, and scientific methodology. Case-based learning using real examples from type 1 and type 2 diabetes enables students to apply theoretical concepts, develop clinical reasoning, and transform practical problems into research questions.

Students participate in hands-on workshops on bibliographic search strategies, critical appraisal, and scientific writing. These workshops are designed to develop transferable skills applicable to future academic or professional settings.

Simulation-based case scenarios and guided laboratory visits are incorporated to expose students to multidisciplinary decision-making and translational research processes, illustrating how experimental findings inform clinical prevention and public health strategies. Collaborative activities, including small-group discussions and guided project development, promote interdisciplinary teamwork and peer learning. Each group receives continuous mentoring from faculty to ensure coherent, methodologically sound project development. The culmination of the course is a mini-conference in which students present their research proposals in a scientific format, fostering communication skills and professional confidence.

This multimodal methodology ensures a comprehensive learning experience by integrating theoretical knowledge with practical research competencies.

In addition, the program intends to apply for endorsement by the International Society for Pediatric and Adolescent Diabetes (ISPAD), in order to strengthen its academic quality, international visibility, and alignment with established educational standards in diabetes.

Requirements



This course is intended for students enrolled in health-related degrees, including Medicine, Nursing, Nutrition, Physiotherapy, Pharmacy, Biomedical Sciences, and Sports Sciences. Participants must have completed at least their first academic year to ensure sufficient foundational knowledge for the theoretical and practical components. As instruction and materials will be delivered in English, a minimum recommended proficiency of B2 is required to understand scientific texts, participate in discussions, and contribute to the research project. Students must have access to a personal laptop for literature searches, data analysis, and project preparation. Prior research experience is not required.

Academic visits & networking

The program places strong emphasis on academic networking and exposure to international research environments. A dedicated virtual session with a representative from Breakthrough T1D (formerly JDRF) will be organized, focusing on current and future research directions in type 1 diabetes prevention, screening initiatives, and translational research. This session will allow students to interact directly with experts involved in large-scale international research and advocacy programs.

The physical mobility component will also include academic visit-based learning activities, comprising a visit to a translational research laboratory at the University of Almería and a guided visit to an external clinical laboratory (subject to institutional permissions). These visits will introduce students to key biomarkers used in diabetes diagnosis, prognosis, and prevention, and illustrate how laboratory data are generated and translated into clinical and public health decision-making. Together with a multidisciplinary simulation scenario focused on diabetes prevention and screening, these activities are designed as observational and role-based learning experiences, suitable for students from diverse health science backgrounds, and aim to reinforce teamwork, communication, and research-oriented thinking.

In addition, the course is designed to foster intensive networking opportunities with an international and multidisciplinary teaching team, including pediatric endocrinologists, nurses, dietitians, epidemiologists, biochemists, and public health researchers from several European universities and clinical centers. Informal networking will be further encouraged through daily small-group research work, mentoring sessions, and social activities, promoting long-term academic collaboration, exchange of ideas, and potential future research mobility among participants and faculty.

Assessment

Participation (20%): Active engagement in workshops, discussions, and teamwork.

Practical assignments / mini-research project (80%): Reports across the activities, bibliographic search exercise, critical appraisal rubric, written scientific abstract, oral presentation on the last day.

Lecturers

Tiago Jerónimo Dos Santos (MD, PhD)

Pediatrician and Assistant Professor at the University of Almería. His research focuses on type 1 diabetes and diabetes-related technologies, combining clinical data analysis with epidemiological approaches to address disease mechanisms, prevention strategies, and therapeutic innovation. He has demonstrated leadership through his involvement as a leader in different pediatric endocrinology medical societies (ISPAD and ESPE) early-career groups and is actively engaged in international teaching initiatives like Science Schools, with experience participating in multidisciplinary and Erasmus+ BIP in diabetes education and research methodology.

Tania Romacho (PhD)

Ramón y Cajal tenure-track researcher at the University of Almería. Her research focuses on the molecular and inflammatory mechanisms linking obesity, insulin resistance, and type 2 diabetes, with particular interest in adipose tissue dysfunction, endothelial damage, and cardiometabolic complications. She has extensive experience in translational and experimental research and is actively involved in teaching and mentoring health science students, contributing to multidisciplinary training initiatives in metabolic diseases and diabetes research. She has previously run a BIP Erasmus+.

María del Mar López Rodríguez (PhD)

Nurse and full professor at the University of Almería. Her academic and research work focuses on quality of life, patient education, and the psychosocial aspects of chronic diseases, with particular emphasis on nursing interventions and patient-centered care. She has broad experience in undergraduate and postgraduate teaching and actively participates in multidisciplinary educational initiatives aimed at improving clinical practice, prevention strategies, and self-management in people with chronic conditions. She has previously run a BIP Erasmus+.



Bruno José Nievas Soriano (MD, PhD)

Pediatrician and full professor at the University of Almería with an academic background centered on pediatric health. His research output includes clinical and observational studies addressing pediatric disorders and health outcomes in children and adolescents, contributing to evidence-based approaches in pediatric care. He is actively involved in undergraduate and postgraduate teaching, with experience integrating research evidence into medical education and multidisciplinary training contexts.

Marta Tejón (PhD)

Registered dietitian and researcher at the Fundación Pública Andaluza para la Investigación Biomédica (FIBAO). Her research focuses on nutrition, metabolic health, and lifestyle-related factors in chronic diseases, with particular emphasis on dietary patterns, obesity, and cardiometabolic risk. She has experience in translational research and applied nutritional interventions and actively contributes to multidisciplinary projects linking nutrition science with clinical and public health approaches

Alda Cortés (PhD)

Nurse, psychologist and assistant professor at the University of Almería. Her research focuses on psychosocial aspects of health, quality of life, mental health, and patient-reported outcomes. She has extensive experience in health education, behavioral interventions, and interdisciplinary research, contributing a biopsychosocial perspective to clinical and educational programs in health sciences. She has experience participating in multidisciplinary and Erasmus+ BIP in diabetes education and research methodology.

Pablo Jiménez López (MSc)

Biochemist specialized in immunology and currently works as a researcher at the University of Almería. He has strong expertise in laboratory-based biomedical research, particularly in immunological techniques, molecular analysis, and experimental models relevant to metabolic and inflammatory diseases. His role supports both research and teaching activities, contributing technical and methodological expertise to translational and educational projects in health sciences.

Jesús Domínguez-Riscart (MD*)

Pediatrician, researcher from the Rio Ortega Grant and lecturer at the University of Cadiz, Spain. His research activity focuses on metabolic and molecular mechanisms involved in chronic diseases, particularly those related to pediatric chronic conditions. He has experience in data analysis and scientific methodology and contributes to teaching activities related to biomedical research and translational science.

Agata Chobot (MD, PhD*)

Pediatric gastroenterologist, Head of the Pediatric Department at the University Hospital of Opole, Poland, and full professor of the Medical Sciences in the University of Opole, Poland. Her research focuses on type 1 diabetes in children and adolescents, including epidemiology, clinical management, early detection, and metabolic outcomes. She is a former leader of the ISPAD early-career group and is actively involved in international collaborative research and teaching initiatives in pediatric diabetes and contributes to training health professionals in evidence-based approaches to diabetes prevention and care.

Rade Vukovic (MD, PhD*)

Pediatric endocrinologist at the Department of Pediatric Endocrinology, Mother and Child Healthcare Institute of Serbia “Dr Vukan Čupić”, and Associate Professor at the School of Medicine, University of Belgrade. His research focuses on pediatric diabetes, obesity, metabolic syndrome, and cardiovascular risk factors in children and adolescents, with particular interest in prevention strategies and early metabolic alterations. He was the former leader of the Young ESPE (YES-ESPE) group and is actively involved in clinical research and international educational collaborations in pediatric endocrinology and diabetes care.

David Lozano Paniagua (PhD)

Biochemist and epidemiologist and full professor of Epidemiology at the University of Almería. His research focuses on population health, epidemiological methods, and the analysis of health determinants using observational and public health data, with contributions to chronic disease research and preventive strategies. He has extensive experience in teaching epidemiology and research methodology to health science students, supporting the development of critical appraisal and data interpretation skills in biomedical research. He has experience participating in multidisciplinary and Erasmus+ BIP in diabetes education and research methodology.

Katja Dumić (MD, PhD*)

Pediatric endocrinologist and associate professor at the Faculty of Medicine, University of Zagreb, Croatia with clinical and research expertise in endocrine disorders. She has an active publication record focusing on endocrine diseases in childhood and adolescent health. She is currently the leader of the Young ESPE (YES-ESPE) group, reflecting her strong involvement in international academic leadership, early-career mentoring, and educational initiatives within pediatric endocrinology.

Alfonso Lechuga Sancho (MD, PhD*)

Pediatrician and Full Professor of Pediatrics at the University of Cádiz, Spain. His research focuses on pediatric endocrinology and metabolism, with particular interest in childhood obesity, insulin resistance, diabetes, and cardiometabolic risk. He has an extensive publication record and is actively involved in undergraduate and postgraduate medical education, as well as in multidisciplinary and international teaching initiatives related to pediatric metabolic diseases.

Vit Neuman (MD PhD*)

Pediatric endocrinologist at the Department of Pediatrics, Faculty of Medicine, Charles University, and Motol University Hospital in Prague, Czech Republic. His research focuses on pediatric diabetes, obesity, and metabolic disorders, with particular interest in early disease mechanisms, risk stratification, and prevention strategies in children and adolescents. He combines clinical practice with academic teaching and is actively involved in international research and educational collaborations in pediatric endocrinology.

***external professors**



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