

CV Date
31/10/2025
Part A. PERSONAL INFORMATION

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CURRICULUM NARRATIVE SUMMARY

Marie Skłodowska-Curie Postdoctoral Fellow at the Tissue Engineering Research Group (TERG), Royal College of Surgeons in Ireland (RCSI), working on the project “Biomimetic collagen-based scaffolds for the study of pancreatic cancer and delivery of anti-tumoural miRNA for enhanced cancer therapy.” My research integrates biomaterials, gene delivery, and nanomedicine to develop advanced therapeutic platforms for cancer treatment and regenerative medicine, specially meniscus regeneration.

During my undergraduate studies in Healthcare Engineering (Specializing in Biomedical Engineering) at the University of Seville, I developed a strong interest in biomaterials for tissue engineering and regenerative medicine. I had the opportunity to join the Clinical Management Unit of General Surgery at Virgen del Rocio University Hospital (HUVR) and the research group “Advanced surgery and transplantation. Cell therapy and bioengineering applied to surgery” at the Instituto de Biomedicina de Sevilla (IBiS) to complete my undergraduate project. I continued working with this group for both my master’s thesis and PhD.

I earned my PhD in Molecular Biology, Biomedicine, and Clinical Research from the University of Seville with the distinction of Excellent Cum Laude. My thesis focused on 3D bioprinting and electrospun scaffolds stimulated electrically and mechanically in bioreactors for skeletal muscle regeneration. During my PhD, I performed research in 3D bioprinting, tissue engineering, regenerative medicine, biomaterials clinical application surgical planning and new devices, as I was involved in other different projects.

I also contributed to two Strategic Action in Health projects funded by the Instituto San Carlos III (2020 and 2023): “Application of 3D bioprinting device created for locoregional delivery of chemotherapy in the personalized treatment of pancreatic cancer” and “Implementation of intraoperative liquid biopsy as an R1 marker in pancreatic cancer surgery (BLIPANC)”. My work included developing spheroids and evaluating drug delivery for pancreatic cancer. This made me realise the importance of new personalised devices, and the aggressiveness of pancreatic cancer.

As a result of my research, I am co-inventor on four patents related to healthcare and new technologies, and I have authored nine articles in indexed journals and three book chapters. I have also contributed to academic teaching as a collaborating professor in the Healthcare Engineering degree (Tissue Engineering) and in the Master’s in Medical Research: Clinical and Experimental in subjects such as “Tissue Engineering” and “Regenerative Medicine applied to clinical research” and “Targets in cancer therapy. Experimental cancer models”, delivering over 90 hours of instruction. In addition, I have co-supervised several outstanding undergraduate and Master’s theses and mentored numerous student during their internship in the lab.

Since August 2023 I have been working as a postdoctoral researcher in the TERG, led by Prof. Fergal O’Brien, at the Royal College of Surgeons in Ireland (RCSI). Here, I am expanding my expertise in scaffold fabrication, nanomedicine, drug delivery and cell therapy. In February 2024, I was awarded with a MSCA-PF. This fellowship is supporting the continued development of my scientific expertise while also strengthening skills in project management, leadership, entrepreneurship, commercialisation, dissemination and profile enhancement.

Beyond academia, I am actively involved in science communication and outreach. I have participated in public engagement activities such as interviews and hosting Transition Year

students, and I was selected to present at the MSCA Falling Walls Lab 2025, a prestigious research dissemination competition.

1. RESEARCH, KNOWLEDGE TRANSFER AND EXCHANGE ACTIVITIES

1.1. PROJECTS AND CONTRACTS FOR RESEARCH AND KNOWLEDGE TRANSFER AND EXCHANGE

1.1.1. Projects

- 1 **Project.** Biomimetic collagen-based scaffolds for the study of pancreatic cancer and delivery anti-tumoural miRNA for enhanced cancer therapy.. CENTRO DE ACUSTICA APLICADA Y EVALUACION NO DESTRUCTIVA. Francisco José Calero Castro. (Royal College of Surgeon in Ireland). 01/08/2024-31/07/2026. 199.694,4 €.
- 2 **Project.** Implementation of intraoperative liquid biopsy as an R1 marker in pancreatic cancer surgery (BLIPANC).. Instituto de Salud Carlos III. (FUNDACION PUBLICA ANDALUZA PARA LA GESTION DE LA INVESTIGACION EN SALUD DE SEVILLA). 01/01/2023-31/12/2025. 198.440 €. Team member.
- 3 **Project.** Implementation of a 3D bioprinting device for locoregional delivery of chemotherapy in the personalized treatment of pancreatic cancer.. Instituto de Salud Carlos III. (FUNDACION PUBLICA ANDALUZA PARA LA GESTION DE LA INVESTIGACION EN SALUD DE SEVILLA). 01/01/2020-31/12/2022. 173.332,5 €. Contratado.
- 4 **Project.** Short list ON Kick-Starter Grant: "MeniReg: Gene-Activated Scaffolds to Enhance Meniscus Repair". Orthopedic Network. Francisco José Calero Castro.

1.1.2. Contracts

- 1 **Contract.** Alofisel-5003: An observational post-marketing registry on the effectiveness and safety of darvadstrocel in patients with Crohn's disease and complex perianal fistulas (INSPIRE) Takeda Pharmaceuticals International AG. Fernando de la Portilla de Juan. From 31/07/2020.
- 2 **Contract.** A Follow-up of a Phase 3 Study to Evaluate the Long-term Safety and Efficacy of Darvadstrocel in the Treatment of Complex Perianal Fistula in Subjects With Crohn's Disease Who Have Participated in ADMIRE II Study Millennium Pharmaceuticals, Inc, a subsidiary of Takeda Pharmaceutical Company Limited. Fernando de la Portilla de Juan. From 19/05/2020.
- 3 **Contract.** A phase III, randomised, double blind, parallel group, placebo controlled, multicentre study to assess efficacy and safety of adult allogeneic expanded adipose-derived stem cells (eASCs) for the treatment of complex perianal fistulising Crohn's disease over a period of 24 weeks and a follow up period up to 52 weeks. ADMIRE-II STUDY Tigenix. From 31/01/2018.

1.2. RESULTS AND DISSEMINATION OF RESEARCH AND KNOWLEDGE TRANSFER AND EXCHANGE ACTIVITIES

1.2.1. Research activity

AC: corresponding author. (nº x / nº y): position / total authors. If applicable, indicate the number of citations

- 1 **Scientific paper.** Javier Padillo Ruiz; Cristóbal Fresno; Gonzalo Suárez; et al; Luis Sabater; (17/26) Francisco Calero. 2024. Effects of the superior mesenteric artery approach versus the no-touch approach during pancreatoduodenectomy on the mobilization of circulating tumour cells and clusters in pancreatic cancer (CETUPANC): randomized clinical trial. British Journal of Surgery. Oxford. 8-6.
- 2 **Scientific paper.** Javier Padillo Ruiz; Carlos García; Gonzalo Suárez; et al; Luis Sabater; (17/28) Sheila Pereira. 2024. Intraoperative liquid biopsy as a tool for detecting R1 resection during pancreatoduodenectomy in patients with pancreatic carcinoma: the CETUPANC trial (part II). International Journal of Surgery. Oxford. pp.7798-7805.

- 3 **Scientific paper.** (1/6) Francisco José Calero Castro (AC); Victor Manuel Perez Puyana; Iman Laga; Javier Padillo Ruiz; Alberto Romero; Fernando de la Portilla de Juan. 2024. Mechanical Stimulation and Aligned Poly(ϵ -caprolactone)–Gelatin Electrospun Scaffolds Promote Skeletal Muscle Regeneration. ACS Applied Bio Materials. ACS Publications. 7-10, pp.6430-6440.
- 4 **Scientific paper.** Carmen Cepeda; Oihane Mitxelena Iribarren; (3/10) Francisco José Calero Castro (AC); et al; Javier Padillo Ruiz. 2023. TARTESSUS: a customized drug delivery system for local chemotherapy in pancreatic cancer. Bioengineering. mdpi. ISSN 2306-5354. JCR (5.046).
- 5 **Scientific paper.** (1/12) Francisco José Calero Castro; Sheila Pereira Arenas; Imán Laga; et al; Javier Padillo Ruiz. 2023. Quantification and characterization of CTCs and clusters in pancreatic cancer by means of Hough transform algorithm. International Journal of Molecular Sciences. mdpi. JCR (6.208), JCR (6.208).
- 6 **Scientific paper.** Oihane Mitxelena Iribarren; Marc Riera Pons; Sheila Pereira Arenas; Francisco José Calero Castro; Juan Manuel Castillo Tuñón; Javier Padillo Ruiz; Maite Mujika; Sergio Arana. 2022. Drug loaded PCL electrospun nanofibers as anti-pancreatic cancer drug delivery systems. Polymer Bulletin. ISSN 0170-0839. WOS (0). JCR (2.843).
- 7 **Scientific paper.** Javier Padillo Ruiz; Gonzalo Suárez; Sheila Pereira; et al; María José Serrano; (4/17) Francisco José Calero Castro. 2021. Circulating Tumor Cells Enumeration from the Portal Vein for Risk Stratification in Early Pancreatic Cancer Patients. Cancers. 13-6153. ISSN 2072-6694. WOS (2). JCR (6.575).
- 8 **Scientific paper.** Virginia Durán Muñoz-Cruzado; (2/8) Francisco José Calero Castro; Andrés Padillo Erguía; Luis Tallón Aguilar; José Tinoco González; Juan Carlos Puyana; Felipe Pareja Ciuró; Javier Padillo Ruiz. 2020. Using a bio-scanner and 3D printing to create an innovative custom made approach for the management of complex entero-atmospheric fistulas. Scientific reports. Nature. 10-1. ISSN 2045-2322. WOS (4). JCR (4.996).
- 9 **Scientific paper.** (1/7) Francisco José Calero Castro; Yaiza Yuste Herranz; Sheila Pereira Arenas; Maria Dolores Garvi; María Ángeles López García; Francisco Javier Padillo Ruiz; Fernando de la Portilla de Juan. 2019. Proof of concept, design and manufacturing by 3D bioprinting of a mesh with bactericidal capacity: behaviour in vitro and in vivo. Journal of Tissue Engineering and Regenerative Medicine. Wiley. 13-11, pp.1955-1964. ISSN 1932-6254. WOS (8). JCR (3.319), JCR (3.319), JCR (3.319), JCR (3.319).
- 10 **Congress.** Francisco José Calero Castro; Elizabeth Sainsbury; Giulio Brunetti; Marko Dobricic; Xuehua Lin; Helena Kelly; Paul Ridgway; Fergal O'Brien. Increases in stiffness and presence of fibronectin in collagen-based scaffolds provide an in vitro biomimetic model of pancreatic cancer. The 34th Annual Conference of the European Society for Biomaterials (ESB) 2025. European Society for Biomaterials. 2025. Italy. Participatory - oral communication. Conference.
- 11 **Congress.** Francisco José Calero Castro; Golestan Salimbeige; Claudio Intini; Tom Hodgkinson; Sally A. Cryan. A pro-chondrogenic, multilayered, reinforced collagen-based scaffold fabricated using melt-electrowriting and electrospinning for meniscus regeneration. The ORS 2025 Annual Meeting. Orthopedic Research Society. 2105. United States of America. Participatory - poster. Conference.
- 12 **Congress.** Francisco José Calero Castro; Golestan Salimbeige; Tom Hodgkinson; Sally A. Cryan. A pro-chondrogenic, multilayered, reinforced collagen-based scaffold fabricated using melt-electrowriting and electrospinning for meniscus regeneration. 30th Annual Conference of the Section of Bioengineering of the Royal Academy of Medicine in Ireland (BINI 2025). Royal Academy of Medicine in Ireland. 2105. Ireland. Participatory - oral communication. Conference.
- 13 **Congress.** Francisco José Calero Castro; Víctor Pérez Puyana; Iman Laga Boul-Atarass; Francisco Javier Padillo Ruiz; Alberto Romero; Fernando de la Portilla de Juan. Electrospun scaffolds of PCL and gelatin for skeletal muscle tissue engineering.. 1st FEBS-IUBMB-ENABLE International Molecular Biosciences PhD and Postdoc Conference. FEBS-IUBMB-ENABLE. 2022. Spain. Organizational - Scientific and organizing committee.

- 14 Congress.** Francisco José Calero Castro; Virginia Durán Muñoz-Cruzado; Javier Padillo Ruiz. Design engineering in the treatment of Enterotatmospheric Fistulas. 38o Seminario de Ingeniería Hospitalaria, Congreso Nacional, y en el 9th IFHE-EU Congress (SÍ PERIODICO). Asociación Española de Ingeniería Hospitalaria. 2021. Spain. Participatory - poster.
- 15 Congress.** Francisco José Calero Castro. Design of an executable for automation of CTCs (CECs) counting in pancreatic cancer.. Hepatic, Digestive and Inflammatory Diseases Area Seminar. INSTITUTO DE BIOMEDICINA DE SEVILLA. 2021. Spain. Participatory - oral communication. Seminar.
- 16 Congress.** Francisco José Calero Castro; Yaiza Yuste Herránz; Sheila Pereira Arenas; María Dolores Garvín; M. Ángeles López García; Francisco Javier Padillo Ruíz; Fernando de la Portilla de Juan. Proof of concept, design and 3D printing manufacturing of antimicrobial meshes. XVI Foro de investigadores del IBiS. INSTITUTO DE BIOMEDICINA DE SEVILLA. 2020. Spain. Participatory - poster. Training Session.
- 17 Congress.** Francisco José Calero Castro; Paula Villanueva Gómez; Carlos González García; Francisco Javier Padillo Ruíz; Fernando de la Portilla de Juan. Use of 3D bioprinting to create skeletal muscle. XXXVII Congreso Anual de la Sociedad Española de Ingeniería Biomédica. Sociedad Española de Ingeniería Biomédica. 2019. Spain. Participatory - oral communication. Conference.
- 18 Congress.** Carlos Gálvez García; Francisco José Calero Castro; Mariano José Parada Blázquez; Sara Sánchez Talavera; Fernando de la Portilla de Juan; ; Francisco Javier Castell Monsalve. 3D printing of biomodels in the study of perianal fistulas and their anatomical relationships.. XIX Congreso de la Sociedad Española de Diagnóstico por Imagen del Abdomen. Sociedad Española de Diagnóstico por Imagen del Abdomen. 2019. Spain. Participatory - oral communication.
- 19 Congress.** Francisco José Calero Castro. 3D BIOPRINTING OF SKELETAL MUSCLE CONSTRUCTS WITH DIFFERENT BIOINK AND THE USE OF BIOREACTOR FOR STIMULATING. The Cell Therapy Workshop, "the 55th SLTB Scientific Conference". SOCIETY FOR LOW TEMPERATURE BIOLOGY. 2019. Spain. Participatory - invited / keynote talk. Conference.
- 20 Congress.** Francisco José Calero Castro; Carlos Gálvez García; Fernando de la Portilla de Juan. Creation of biomodels of anal canals with fistulous pathways. XI Congreso Nacional de la Sociedad de Electromedicina e Ingeniería Clínica. Sociedad Española de Electromedicina e Ingeniería Clínica. 2019. Spain. Participatory - oral communication. Conference.
- 21 Congress.** Francisco José Calero Castro; Carmen Vigil-Escalera Reyes; Francisco Javier Padillo Ruiz; Fernando de la Portilla de Juan. Design and bioprinting of instruments for anal fistula treatment.. XI Congreso Nacional de la Sociedad de Electromedicina e Ingeniería Clínica. Sociedad Española de Electromedicina e Ingeniería Clínica. 2019. Spain. Participatory - oral communication.

1.2.2. Transfer and exchange of knowledge and professional activity

- 1 Patent of invention.** The use of the Hough's transform algorithm to count Circulating Tumour Cells (CTCs)" Reg 14/12/2021 Spanish patent.
- 2 Patent of invention.** DRUG DELIVERY SYSTEM USING ELECTROSPINNING OF POLYMERS Reg 10/11/2021 Spanish patent. EU patent.
- 3 Utility model.** DEVICE FOR ISOLATING FISTULOUS ORIFICES AND ITS MANUFACTURING PROCESS Reg 17/06/2019 Spanish patent.
- 4 Patent of invention.** Device for fistulous tract curettage Reg 28/12/2018 Spanish patent.

Professional activity

- 1 MSCA Postdoctoral fellow:** Royal College of Surgeon in Ireland. 2024- actual.
- 2 Postdoctoral Researcher:** Royal College of Surgeon in Ireland. 10/08/2023. (11 months).
- 3 Specialist technician:** FUNDACION PUBLICA ANDALUZA PARA LA GESTION DE LA INVESTIGACION EN SALUD DE SEVILLA. 09/07/2020. (3 years - 1 month - 2 days). Temporary.

- 4 **Research support technician:** FUNDACION PUBLICA ANDALUZA PARA LA GESTION DE LA INVESTIGACION EN SALUD DE SEVILLA. 13/12/2018. Temporary employment contract.
- 5 **Intern:** MINISTERIO DE EDUCACION Y CIENCIA. 01/11/2017. (8 months).

1.2.3. Scientific outreach

- 1 **Fairs and exhibitions.** AMBER Transition Year Student visit (AMBER Transition Year Student visit). 23/10/2025.
- 2 . EB Awareness Week (Inside out day). 22/10/2025.
- 3 **Fairs and exhibitions.** AMBER Transition Year Student visit (AMBER Transition Year Student visit). 03/04/2025.
- 4 **Fairs and exhibitions.** Biomimetic collagen-based scaffolds for the study of pancreatic cancer and delivery anti-tumouralmiRNA for enhanced cancer therapy (European Research Night). 27/09/2024.
- 5 **Media interviews.** Francisco José Calero, un ingeniero biomédico en Irlanda (La cresta de la Onda). 13/08/2024.
- 6 **Media interviews.** Activación génica de andamios tisulares (Investigadores por el mundo). 09/07/2024.

2. TEACHING ACTIVITY

2.1. TEACHING EXPERIENCE

2.1.3. Educational resources

- 1 **Chapters of books:** Notions on Tissue Engineering and Applied Regenerative Medicine. Francisco José Calero Castro. 2020.
- 2 **Chapters of books:** Notions on Tissue Engineering and Applied Regenerative Medicine. Francisco José Calero Castro. 2020.
- 3 **Chapters of books:** Notions on Tissue Engineering and Applied Regenerative Medicine. Francisco José Calero Castro. 2020.

3. LEADERSHIP

3.1. MANAGEMENT OF TEACHING AND RESEARCH TEAMS

- 1 **Grupo IBIS-E-02 "Advanced surgery and transplantation. Cell therapy and bioengineering applied to surgery":** Consejería de Transformación Económica, Industria, Conocimiento y Universidades. Spain. 13/12/2018.
- 2 **Grupo de investigación CTS-664 "Advanced surgery and transplantation. Cell therapy and bioengineering applied to surgery":** Consejería de Salud de la Junta de Andalucía. Spain. 13/12/2018.
- 3 **IBIS-Coloproctology:** INSTITUTO DE BIOMEDICINA DE SEVILLA. 17/07/2017.

3.2. SUPERVISION OF DOCTORAL THESES AND MASTER'S THESES

- 1 **Master's Thesis:** Gene-activated scaffold to enhance meniscus repair. Trinity College Dublin. 05/08/2025.
- 2 **Minor thesis:** The Effect of Fibronectin on an in vitro Collagen-based Pancreatic Cancer Model. Royal College of Surgeon in Ireland. 11/04/2025. 65.
- 3 **End of course project:** STUDY OF 3D BIOPRINTING COLLAGEN SCAFFOLDS. Universidad de Sevilla. 20/12/2022. 9.
- 4 **End of course project:** BEHAVIORAL STUDY OF ELECTROSPUN SCAFFOLDS FOR SKELETAL MUSCLE REGENERATION. Universidad de Sevilla. 22/09/2021. 10.
- 5 **End of course project:** Bioprinting, technological innovation in surgery. Universidad de Sevilla. 08/07/2021. 9.
- 6 **Minor thesis:** Hydrogels for skeletal muscle regeneration. Universidad de Sevilla. 30/06/2021. 8,3.

- 7 **Minor thesis:** 3D cultures model derived from pancreatic adenocarcinoma.. Universidad de Granada. 15/09/2020. 10.
- 8 **End of course project:** Biomaterials in 3D bioprinting. Universidad de Sevilla. 14/07/2020. 10.
- 9 **End of course project:** Design of hydrogel and PCL scaffolds. Universidad de Sevilla. 01/07/2019. 9.3.
- 10 **End of course project:** Manufacturing of a device for surgical curettage of fistulous tracts.. Universidad de Sevilla. 13/07/2018. 10.
- 11 **Master's Thesis:** Axon-targeted activation of TrkA via scaffold-mediated miRNA delivery for enhanced regeneration of long-gap peripheral nerve injuries. Trinity College Dublin.
- 12 **Master's Thesis:** Engineered siRNA-activated scaffold for silencing KRAS expression in pancreatic tumours. Trinity College Dublin.

3.4. RECOGNITION AND RESPONSIBILITY IN SCIENTIFIC ORGANISATIONS AND SCIENTIFIC-TECHNICAL

- 1 **1st FEBS-IUBMB-ENABLE International Molecular Biosciences PhD and Postdoc Conference Local Organizing Committee:** FEBS-IUBMB-ENABLE. 10/2021-18/11/2022
- 2 **Predocctoral Representative of the Digestive Diseases area in the IBiS Scientific Committee.:** From 09/2020.