
DR.ENG.CAROLINAVARGASESTEVEZ

PROFILE

I am an interdisciplinary biomedical and electronic engineer, with research experience in projects using micro and nanotechnologies, nanorobotics, smart materials, piezoelectrics, bioengineering and energy harvesting technologies. I have experience in conducting projects from research to possible spin-off. I have experience in funding schemes, procurement processes and project management.

PROFESSIONAL EXPERIENCE

IBEC – Institute for Bioengineering of Catalonia Biomaterials for Regenerative Therapies

Position: Postdoctoral Researching Exchange (Barcelona,Spain)

Time worked: July 2024 - February 2025

UNIVERSITAT POLITECNICA DE CATALUNYA- Biomaterials, Biomechanics and Tissue Engineering division (BBT)

Position: Postdoctoral Researcher (Barcelona,Spain)

Time worked: October 2023 - February 2025

Brno University of Technology (Vysoké učení technické VUT)

Position: Postdoctoral Researcher (Brno, Czech Republic) Time

worked: December 2021 – November 2022.

CENTER FOR RESEARCH IN MEDICAL DEVICES (CURAM) / NATIONAL UNIVERSITY OF IRELAND (NUIG)

Position: Postdoctoral Researcher (Galway, Ireland)

Time worked: July 2019 – November 2021

INSTITUTO DE MICROELECTRÓNICA DE BARCELONA IMB-CNM (CSIC)

Position: Engineer-Researcher (Barcelona, Spain)

Time worked: June 2017 – February 2019

INSTITUTO DE MICROELECTRÓNICA DE BARCELONA IMB-CNM (CSIC)

Position: PhD researcher – FPI contract (Barcelona, Spain)

Time worked: May 2015 – April 2017

INSTITUTO DE MICROELECTRÓNICA DE BARCELONA IMB-CNM (SECRETARIA DE ESTADO DE INVESTIGACION)

Position: PhD researcher – FPI researcher-grant holder (Barcelona, Spain) Time worked:

May 2013 – April 2015

DERMOCELL COLOMBIA. S.A.S

Position: Research and Development Engineer (Bogotá, Colombia)

Time worked: September 2012 – April 2013

NATIONAL UNIVERSITY OF COLOMBIA

Position: Consultant Engineer of the telecommunication net systems of the new Airport El Dorado (Bogotá, Colombia)

Time worked: April 2010 – July 2010

CIDEI (Center of Research in the Electrical and Electronic Industry and Informatics).

Position: Assistant of Research and Development Projects, in partnership with Colciencias. (Bogotá, Colombia)

Time worked: March 2009 –January 2010

NATIONAL UNIVERSITY OF COLOMBIA

Position: Monitor of Electrical and Electronic Engineering Department in the International Seminar of Security (Bogotá, Colombia)

Time worked: February - July of 2009

SECURITY SYSTEM

Position: Assistant Project Manager (Bogotá, Colombia)

Time worked: June – August 2008

EDUCATION

Universitat de Barcelona**2013-2018**

along with **Instituto de Microelectrónica de Barcelona IMB-CNM (CSIC)**

PhD in Nanosciences - CUM LAUDE

Dissertation: *"Suspended Micro/nanogenerators for cell stimulation"* Jan 2019

Dissertation Advisors: Prof. Jaume Esteve and Dr. Gonzalo Murillo

University of Minnesota
Nano-magnetics and photonic group
Academic Exchange

May 2015 - Oct 2015

Universidad Politécnica de Madrid - UPM (Madrid, Spain) **MSc**
in Biomedical Engineering

2010- 2012

Universidad Nacional de Colombia (Bogotá, Colombia) **2004-2009**
Bachelor's Degree in *Electronic Engineering* with emphasis in bioinstrumentation, microelectronics and biomedical engineering.

INTERNATIONAL EXPERIENCE

2020, *Academic Exchange*, **Swiss Federal Institute of Technology Zurich (ETH)**, Zurich, Switzerland
2015, *Academic Exchange*, **University of Minnesota - Twin Cities**, Minneapolis, United States

AWARDS

-
- ✦ Seal of Excellence High-quality project proposal H2020 MSCA IF 2020, Score 90, Horizon 2020, European Commission, March 2021.
 - ✦ Scholarship for Researcher Training (Formación de Personal Investigador - FPI) from the Science and Innovation Ministry, Spain 2013-2017.
 - ✦ Mobility Scholarship Grant for International academic exchange 2015 from the Science and Innovation Ministry, Spain 2015.
 - ✦ Scholarship for Master studies 2011-2012 from the Education and Culture Ministry of Spain.
 - ✦ Scholarship for Master studies 2011-2012 from UPM-Santander (declined).
 - ✦ Scholarship for Foreign Language French 2012 summer from the Education and Culture Ministry of Spain.

LANGUAGE SKILLS

-
- ✦ Spanish (native speaker)
 - ✦ English (Proficiency: Advanced, Internet-based TOEFL; score 89/120)
 - ✦ French (Proficiency: Basic; A2 level, Summer Course ILA France, Montpellier)
 - ✦ German (Escuela Oficial de Idiomas EOI, level1)
 - ✦ Catalan (basic level)

PROJECT PARTICIPATION

Title: Nanoengineered magnetoelectric 3D hydrogels with built-in soft electronics for bioengineering applications (NAMASTE)

Financial Entity: ERC CZ (European Union)

Duration: Oct 2023-November 2025

Principal Researcher: Prof. Jose Manuel Garcia
Title: Autonomous intelligent micro-swimmers swarms
Financial Entity: ERC CZ (European Union)
Duration: April 2022-Novemeber 2022
Principal Researcher: Prof. Martin Pumera

Title: Electrochemistry of 2D materials
Financial Entity: GAC EXPRO (CZ Government)
Duration: December 2021- November 2022
Principal Researcher: Prof. Martin Pumera

Title: ECHO SENS Externally Charged Cardiovascular Biosensor
Financial Entity: SFI – RoI (Ireland Government)
Time: July 2019-Novemeber 2021
Principal Researcher: Prof. Manus Biggs

Title: MINAHE 6: Advanced suspensions of MicroNanoTools for intra- and extracellular applications (TEC2017-85059-C3-1-R).
Financial Entity: Ministerio de Ciencia e Innovación (Spanish Government)
Time: January 2018-December 2020
Principal Researcher: Prof. José A. Plaza

Title: NG4BEAT: Autonomous cellular non-intrusive nano-pacemaker. Electroestimulación celular individual mediante nanogeneradores piezoeléctricos distribuidos (TEC2015-72461-EXP).
Financial Entity: Ministerio de Ciencia e Innovación (Spanish Government)
Time: January 2016-December 2018
Principal Researcher: Prof. Jaume Esteve

Title: MINAHE 5: Suspensions of MicroNanoTools for applications in living cells (TEC2014-51940-C02-01).
Financial Entity: Ministerio de Ciencia e Innovación (Spanish Government)
Time: January 2015-December 2017
Principal Researcher: Prof. José A. Plaza

Title: NANONEURO: Nanogeneradores aplicados a Neurociencia (INTRAM PIE201350E110).
Financial Entity: Consejo Superior de Investigaciones Científicas - CSIC (Spanish Government)
Time: December 2013 – December 2016
Principal Researcher: Prof. Jaume Esteve

Title: MINAHE 4: Design and Fabrication of micronanotools for life science (TEC2011-29140-C03-01).
Financial Entity: Ministerio de Ciencia e Innovación (Spanish Government)
Time: January 2012-December 2014
Principal Researcher: Prof. José A. Plaza

Title: NANOPHOR: Development of electrophoretic and photonic techniques for pathogenic microbes' identification and monitoring

Financial Entity: CIBER-BBN

Time: November 2011 to July 2012

Principal Researcher: Prof. Francisco del Pozo Guerrero (José Javier Serrano Olmedo, Coordinator)

Title: Strengthening the competitiveness of companies in the electronic industry cluster of Bogota and Cundinamarca by appropriation and the design of technologies by FPGA and CPLD

Financial Entity: COLCIENCIAS -Colombia

Time: February 2009 to September 2009

Principal Researcher: Dr. Carlos Sanchez

PROJECTS MENTORED

“Fabricación y caracterización de microcélulas fotovoltaicas para aplicaciones biológicas”

Final Project of Mr. Cristian Duro Clavero

Bachelor in Electronic Engineering

PEER-REVIEWED PUBLICATIONS

- ✦ C. Vargas-Estevez, A. Blanquer, G. Murillo, L. Barrios, E. Ibáñez, C. Nogués and J. Esteve, «Electrical stimulation of cells through photovoltaic microcell arrays, » Nano Energy, vol. 51, p. 571-578, 2018.
- ✦ C. Vargas-Estevez, M. Duch, M. Duque, F. J. del Campo, L. Enriquez-Barreto, G. Murillo, N. Torras, J. A. Plaza, C. A. Saura, J. Esteve, «Suspended Silicon Micro-photodiodes for Electrochemical and Biological Applications,» Small, vol. 13, no 41, p. 1701920, 2017.
- ✦ C. Vargas-Estevez, A. Blanquer, P. Dulal, R. P. del Real, M. Duch, E. Ibanez, L. Barrios, G. Murillo, N. Torras, M. Duch, C. Nogués, B. Stadler, J. A. Plaza y J. Esteve, «Study of Galfenol direct cytotoxicity and remote microactuation in cells,» Biomaterials, vol. 139, p. 67-74, 2017.
- ✦ G. Murillo, A. Blanquer, C. Vargas-Estevez, L. Barrios, E. Ibáñez, C. Nogués and J. Esteve, "Electromechanical Nanogenerator-Cell Interaction Modulates Cell Activity," Adv Mat, vol. 29, no 24, p. 1605048, 2017.
- ✦ C. Vargas-Estevez, R. R. Robaina, R. P. del Real and J. A. Plaza, "Nanometric Metal-Film Thickness Measurement Based on a Planar Spiral Coils Stack," IEEE Transactions on Nanotechnology, vol. 14, no 2, p. 297-303, 2015.

PATENT

- ✦ Vargas-Estevez, C., Murillo, G., Esteve, J.

Self-generating voltage device for electrical cell stimulation, and method thereof

Patent Number: EP3351291A1 – US20190359969A1

20th January 2017