

Ernesto Criado-Hidalgo

Aerospace engineer working at the intersection of engineering and medicine

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EXPERIENCE

California Institute of Technology, Pasadena, CA — Postdoctoral Scholar Research Associate in Chemical Eng.

JULY 2020 - PRESENT

*Currently developing new technologies towards the sonogenetic control of cellular function.

*Participated in a significant number of projects developing technologies in the new field of biomolecular ultrasound

University of California , San Diego, CA — Postdoctoral Scholar in Mechanical and Aerospace Eng.

FEBRUARY 2020 - JUNE 2020

*Developed new tunable photoinitiated hydrogel microspheres for direct quantification of cell-generated forces in complex three-dimensional environments.

University of California , San Diego, CA — Graduate Student Researcher in Mechanical and Aerospace Eng.

SEPTEMBER 2013 - JANUARY 2020

*Experimentally investigated collective cell migration and intercellular stresses in migrating epithelial monolayers in the presence of heterogeneities.

*Investigated the mechanics of the cerebrospinal fluid (CSF) in the spinal canal and its role in the regulation of intracranial pressure (ICP) in the context of neurodegenerative disorders like Normal Pressure Hydrocephalus (NPH).

Yale University, New Haven, CT — Visiting Assistant in Research in Mechanical Eng.

OCTOBER 2011 - JUNE 2013

*Investigated structure of large molecules via ion mobility-mass spectrometry (DMA-MS) and studied the kinetics of ion evaporation in ionic liquids via mobility analyzers in tandem.

SKILLS

Advanced knowledge of the biophysics of ultrasound and acoustic propagation in tissue.

Design of ultrasound neuromodulation experiments

Imaging of cell cultures using ultrasound platforms (e.g., Verasonics, custom rigs)

Understanding of acoustic scattering and contrast generation at the cellular/molecular level.

Design and expression of acoustic reporter genes (ARGs) for cellular ultrasound imaging

Experimental Design & Validation

Advanced data analysis and interpretation

Hardware/software prototype iteration & debugging.

Computational Modeling & Simulation (e.g., MATLAB, COMSOL, ANSYS, Python)

CAD Design (e.g., SolidWorks, AutoCAD)

Cross-functional collaboration (engineering, neuroscience, clinical)

Sociedad Europea de Análisis Diferencial de Movilidad (SEADM S.L.), Valladolid, Spain — *Research Engineer*

FEBRUARY 2009 - SEPTEMBER 2011

*Startup based in Valladolid working towards developing ultrasensitive vapor analyzers based on the combined technology of mass spectrometry and ion mobility.

*Contributed to a wide number of research projects investigating the mechanisms of secondary electrospray ionization and breath VOCs analysis via ion mobility-mass spectrometry.

EDUCATION

University of California, San Diego, CA — *Ph.D. in Mechanical & Aerospace Eng. with Specialization in Multi-Scale Biology*

JANUARY 2020

*Relevant coursework: Tissue Engineering, Cell and Molecular Biology, Biochemistry, Molecular Imaging & Quant. In Living Cells, Workshop in Electron Microscopy.

University of California, San Diego, CA — *MSc in Mechanical & Aerospace Engineering*

JUNE 2014

*Relevant coursework: Applied Math, Fluid Mechanics, Numerical Analysis, Computational Fluid Dynamics.

Universidad Politécnica de Madrid, Spain — *BSc/MSc in Aerospace engineering – Minor: Space Vehicles*

NOVEMBER 2008

*Relevant coursework: Math, Physics, Material Science, Thermodynamics, Fluid Mechanics, Aerodynamics, Numerical Analysis, Flight Mechanics.

Literature Review & Scientific Synthesis

Extreme adaptability to new Technologies / Fields

AWARDS

James Boswell Postdoctoral Fellowship – California Institute of Technology – 2 year full stipend and research grant fellowship to conduct multidisciplinary research at the interface of engineering and medicine

“la Caixa” Fellowship for graduate studies in the US – UC San Diego – 2 year full tuition and stipend fellowship to pursue graduate studies in the US

3rd place – Pegasus AIAA European Student Conference MSc Thesis Competition – Universidad Politécnica de Madrid – Awarded 3rd place for the MSc thesis project titled “Design of a ring-cusp ion thruster as a laboratory plasma source”. This marked the first time a Spanish national received an award in the competition’s history

LANGUAGES

Spanish (native), English (full professional proficiency)