Héctor García Martín

Research Scientist

5885 Hollis St., 4th Floor, Emeryville, CA 94608

hgmartin@lbl.gov | hectorgarciamartin.com | Green card holder

Quantitative modeler focused on the combination of machine learning, synthetic biology and automation

Education

Physics Ph. D. — *October 2004*

University of Illinois at Urbana-Champaign — *Urbana, IL USA*

Physics B. Sc. — *June 1999*

University of the Basque Country — *Bilbao, Spain*

Experience

Deputy Vice President, Biofuels and Bioproducts Division — *2018-Present*

Joint BioEnergy Institute (www.jbei.org) — *Berkeley, CA USA*

Lead, Quantitative Metabolic Modeling — *2018-Present*

Joint BioEnergy Institute (www.jbei.org) — *Berkeley, CA USA*

Staff Scientist — *2018-Present*

Lawrence Berkeley National Laboratory (www.lbl.gov) — *Berkeley, CA USA*

- Led the combination of machine learning, synthetic biology and automation.
- Developed a microfluidics device for performing automated CRISPR-based strain modification.

Director, Quantitative Metabolic Modeling — *2011-2018*

Joint BioEnergy Institute — *Berkeley, CA USA*

Computational Biologist Research Scientist Engineer — *2009-2018*

Lawrence Berkeley National Laboratory — *Berkeley, CA USA*

- Used mechanistic models and metabolomics data to improve biofuel production in bioengineered strains.
- Used machine learning and proteomics data to improve biofuel production in bioengineered strains.

Deputy Director, Host Engineering — *2008-2011*

Joint BioEnergy Institute (www.jbei.org) — *Berkeley, CA USA*

Computational Project Scientist — *2007-2009*

Lawrence Berkeley National Laboratory — *Berkeley, CA USA*

- Developed quantitative predictive models for microbial metabolism.
- Developed novel methods to measure metabolic fluxes using ^{13}C tracing experiments, and genome-scale models.

Computational Biologist Post Doctoral Fellow — *2005-2007*

DOE Joint Genome Institute (Lawrence Berkeley National Laboratory) — *Berkeley, CA USA*

- Used metagenomics to create first comprehensive metabolic map of phosphorus removing microbial communities.
- Researched lignocellulose degradation in termite guts through metagenomic techniques.

Graduate Research Assistant — *2000-2004*

University of Illinois at Urbana-Champaign (UIUC), Dept. of Physics — *Urbana, IL USA*

- Derived quantitative explanation for the universal scaling law known as Species Area Relationship.
- Used Path Integral Monte Carlo techniques to simulate Bose Einstein Condensates at very high rotation rates.

Thesis available *here*.

Invited talks (selected)

2020	**Advanced Bioeconomy Leadership Conference 2020**	Virtual event
2019	**Army Science Planning and Strategy Meeting**	Burlington, USA
2019	**AI4Synbio Symposium**	Arlington, USA
2018	**10th International Workshop on Bio-Design and Automation**	Berkeley, USA
2016	**REDBIO 2016 conference**	Lima, Peru
2017	**Washington University EECE Department Seminar**	St. Louis, USA
2015	**Society for Industrial Microbiology (SIMB) annual meeting**	Philadelphia, USA
2015	**Cell factories and sustainability conference**	Hillerod, Denmark
2014	**Metabolomics 2014 conference**	Tsuruoka, Japan
2013	**RECOMB ISCB Conference on Regulatory and Systems Genomics**	Toronto, Canada
2013	**EMSL Biosciences Theme Advisory Panel**	Richland, USA
2012	**2nd International conference on COBRA**	Elsinore, Denmark

Publications (selected)

"ART: a machine learning Automated Recommendation Tool for synthetic biology"
Radivojevic *et al.* **Nature Communications 11, 4879 (2020)**

"Predictive engineering and optimization of tryptophan metabolism in yeast through a combination of mechanistic and machine learning models"
Zhang *et al.* **Nature Communications 11, 4880 (2020).**

"Opportunities at the Intersection of Synthetic Biology, Machine Learning, and Automation"
Carbonell *et al.* **ACS Synthetic Biology 8, 7, 1474–1477 (2019)**

"A machine learning approach to predict metabolic pathway dynamics from time-series multiomics data"
Costello *et al.* **Nature pj Systems Biology & Applications 4.1: 19 (2018)**

"Industrial brewing yeast engineered for the production of primary flavor determinants in hopped beer"
Denby *et al.* **Nature Communications, 9(1): 965 (2018)**

"The Experiment Data Depot: a web-based software tool for biological experimental data storage, sharing, and visualization"
Morrell *et al.* **ACS Synthetic Biology 6, 12, 2248–2259 (2017)**

"Synthetic and systems biology for microbial production of commodity chemicals"
Chubukov *et al.* **Nature pj Systems Biology & Applications 2: 16009 (2016)**

"Metagenomic and functional analysis of hindgut microbiota of a wood feeding higher termite"
Warnecke *et al.* **Nature, 450(7169):560-5 (2007)**

"Metagenomic analysis of phosphorus removing sludge communities"
Garcia Martin *et al.* **Nature Biotechnology, 24: 1263-9 (2006)**

"On the origin and robustness of power-law species-area relationships in ecology"
Garcia Martin *et al.* **Proceedings of the National Academy of Sciences USA (PNAS), 103(27):10310-5 (2006)**

Honors & Awards

MIT's "Innovators under 35" competition jury
Member of **Congresswoman Barbara Lee**'s biotech advisory committee
US permanent resident as **Outstanding Researcher** (EB-12)
Member of the Pacific Northwest **National Laboratory advisory committee** for the "Microbes in Transition" initiative
Renato Bobone Award to the **Outstanding European Graduate Student in Physics** (UIUC)
Excellence in Teaching award (UIUC)
Incomplete List of **Teachers Ranked as Excellent** (UIUC)
Phi Kappa Phi Honors Society

Skills

Python, Matlab, Perl, GAMS, C/C++, UNIX, Linux