

# HERDELINE ANN M. ARDOÑA

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## RESEARCH INTERESTS

Bioinspired materials, adaptive materials, cardiac tissue engineering, optoelectronics, nanotechnology

## PROFESSIONAL APPOINTMENTS AND EDUCATION

- 2020–**            **University of California, Irvine**  
Assistant Professor, Department of Chemical and Biomolecular Engineering  
*Joint appointments (by courtesy):* Department of Biomedical Engineering and Department of Chemistry  
Member, Sue & Bill Gross Stem Cell Research Center (SCRC)  
Affiliate Member, Cardiovascular Innovation and Research Center (CIRC)  
Member, Chemical and Materials Physics (ChAMP) Program
- 2017– 2020**    **Harvard University**  
ACS Irving S. Sigal Postdoctoral Fellow, Disease Biophysics Group
- 2012– 2017**    **Johns Hopkins University**  
Ph.D. Chemistry (with Certificate for Advanced Studies in Nanobiotechnology, 2016)
- University of the Philippines Diliman**
- 2011– 2012**    Instructor 5, Institute of Chemistry, College of Science
- 2007– 2011**    B.S. Chemistry, *summa cum laude*

## SELECTED AWARDS AND HONORS

- NSF CAREER Award (**2023– 2028**)
- 12<sup>th</sup> Irving S. Sigal Postdoctoral Fellow, American Chemical Society (**2018– 2020**):
- *Awarded every two years to one outstanding postdoctoral fellow pursuing research at the chemistry-biology interface*
- International Student Research Fellowship, Howard Hughes Medical Institute (HHMI) (**2015– 2017**)
- Faculty for the Future Fellowship, Schlumberger Foundation (**2014– 2017**)
- Emmett and Elsie Buhle Fellowship Award, Johns Hopkins University (**2014**):
- *Annually given to one graduate student in acknowledgement of excellent academic performance*
- Leticia Shahani Award for Best Undergraduate Thesis, UP Diliman (**2011**)
- Bank of the Philippine Islands-Department of Science and Technology: Science Award, Philippines (**2010**):
- *Annually given to 30 student researchers in the Philippines who excel in science and engineering*

## SELECTED PUBLICATIONS (\*denotes equal contribution; †undergraduate co-authors, ‡corresponding author)

25 total, plus 5 manuscripts under review

- Z.-F. Yao, E. Lundqvist, Y. Kuang, **H.A.M. Ardoña**<sup>‡</sup>. “Engineering multi-scale organization for biotic and organic abiotic electroactive systems,” *Adv. Sci.* **2022**, under revision.
- H. Chang,\* Q. Liu,\* J.F. Zimmerman,\* K.Y. Lee, Q. Jin, M.M. Peters, S. Choi, S.L. Kim, **H.A.M. Ardoña**, L.A. MacQueen, C.O. Chantre, S.E. Motta, E.M. Cordoves, G.J. Touloumes, K.K. Parker, “Recreating the heart’s helical structure-function relationship with focused rotary jet spinning,” *Science*, **2022**, 377, 180.
- **H.A.M. Ardoña**, J.F. Zimmerman, K. Shani, F. Eweje, S.-H. Kim, D. Bitounis, D. Parviz, E. Casalino, M. Strano, P. Demokritou, K.K. Parker, “Differential modulation of endothelial cytoplasmic projections after exposure to graphene-based nanomaterials,” *NanoImpact*, **2022**, 100401.
- K.Y. Lee,\* S.-J. Park,\* D.G. Matthews, S.L. Kim, C. A. Marquez,<sup>†</sup> J.F. Zimmerman, **H.A.M. Ardoña**, A.G. Kleber, G.V. Lauder, K.K. Parker, “An autonomous, humanized fish based on cardiac biophysics,” *Science*, **2022**, 375, 639.
- S. Lim, Y. Kuang, **H.A.M. Ardoña**<sup>‡</sup>. “Evolution of supramolecular systems towards next-generation biosensors,” *Front. Chem.*, **2021**, 9, 723111.

- M. Yadid, J.U. Lind, **H.A.M. Ardoña**, S.P. Sheehy, L.E. Dickinson, F. Eweje,<sup>‡</sup> M.M.C. Bastings, B.D. Pope, B. B. O'Connor, J.R. Straubhaar, B. Budnik, A.G. Kleber and K.K. Parker, “Endothelial extracellular vesicles contain protective proteins and rescue ischemia-reperfusion-injury in a human heart-on-chip,” *Sci. Transl. Med.*, **2020**, 12, 565, eaax8005.
- F. Eweje,<sup>‡</sup> **H.A.M. Ardoña**,\* J.F. Zimmerman, B.B. O'Connor, S. Ahn, T. Grevesse, K.N. Rivera,<sup>‡</sup> D. Bitounis, P. Demokritou and K.K. Parker, “Quantifying the effects of engineered nanomaterials on endothelial cell architecture and vascular barrier integrity using a cell pair model,” *Nanoscale*, **2019**, 11, 17878.
- **H.A.M. Ardoña**,\* T.S. Kale,\* A. Ertel<sup>‡</sup> and J.D. Tovar, “Non-resonant and local field effects on the photophysics of oligo(*p*-phenylenevinylene) segments within peptidic nanostructures,” *Langmuir*, **2017**, 33, 7435.
- **H.A.M. Ardoña**, E.R. Draper, F. Citossi, M. Wallace, L. Serpell, D.J. Adams, and J.D. Tovar, “Kinetically controlled coassembly of multichromophoric peptide hydrogelators and the impacts on energy transport,” *J. Am. Chem. Soc.* **2017**, 139, 8685.
- **H.A.M. Ardoña** and J.D. Tovar, “Peptide pi-electron conjugates: organic electronics for biology?” *Bioconjugate Chem.* (cover article), **2015**, 26, 2290.
- K. Besar,\* **H.A.M. Ardoña**,\* J.D. Tovar and H.E. Katz, “Demonstration of hole transport and voltage equilibration in self-assembled pi-conjugated peptide nanostructures using field-effect transistor architectures.” *ACS Nano*, **2015**, 9, 12401.
- **H.A.M. Ardoña**, K. Besar, M. Togninalli,<sup>‡</sup> H.E. Katz and J.D. Tovar, “Sequence-dependent mechanical, photophysical and electrical transport properties of pi-conjugated peptide hydrogelators.” *J. Mater. Chem. C* (part of a special themed collection: *Bioelectronics* and 2015 *Journal of Materials Chemistry C Hot Papers*), **2015**, 3, 6505.
- **H.A.M. Ardoña** and J.D. Tovar, “Energy transfer within pi-conjugated peptide heterostructures in aqueous environments” *Chem. Sci.*, **2015**, 6, 1474.

## PATENT

- [1] J.D. Tovar, H.E. Katz, **H.A.M. Ardoña**, A.M. Sanders, K. Besar, “Energy transporting pi-conjugated peptide nanomaterials” U.S. Patent #10,316,060.

## SUPPORT

- 2023– 2028 “CAREER: Harnessing Dynamic Cell-Scaffold Interactions to Develop Adaptive Biohybrid Systems” (NSF DMR #2239647, H.A.M. Ardoña, PI)
- 2022– 2023 “Optically Promoting Cardiac Maturation Using Engineered Peptides” (NIH NHLBI #1R56HL164348 – 01- H.A.M. Ardoña, PI)
- 2022– 2026 “RECODE: Spatial Engineering of Morphogens for the Reproducible Formation of Cortical Organoids with Arealization” (NSF CBET #2225624- M. Watanabe, PI; H.A.M. Ardoña and M. Gandal, co-PI)
- 2021– 2022 “Directed Self-Assembly of Optoelectronic Peptides on Nanostructured Polymeric Surfaces” (NSF MRSEC-CCAM Seed Grant Program- H.A.M. Ardoña, PI; A.F. Yee, co-PI)
- 2021– 2023 Interim COVID-19 Research Recovery Program (ICRRP), UCI Office of the Provost and Executive Vice Chancellor
- 2021– 2023 UCI Council on Research, Computing, and Libraries (CORCL) Research Award

## SELECTED SERVICE ACTIVITIES

- Peer review referee: *ACS Nano*; *APL Bioengineering*; *Bioconjugate Chemistry*; *Bioelectricity*; *Biomacromolecules*; *Biomaterials*; *NanoImpact*; *Nature*
- Co-Organizer (with Profs. Naomi Chesler, Anna Grosberg, Quinton Smith, and Pim Oomen), UCI SIRiPods, “Building Beating Hearts” (**August 2022**)
- Speaker (with Prof. Momoko Watanabe), Brain Organoids Manufacturing using Biopolymers Workshop, Irvine Summer Institute in Neuroscience
- Guest Editor, *NanoImpact*, Special Issue on “Environmental and Health Impacts of Two-Dimensional Nanomaterials” (**June 2022–**)
- Co-Organizer, Future Faculty Workshop: Preparing Diverse Leaders for the Future, NSF DMR #2226708 (**2022–**)
- Panelist, Merck Outstanding Chemists of Color Symposium, ACS San Diego (**March 2022**)
- Mentor and Volunteer, Intersections Science Fellows Symposium (**September- November 2021**)
- Mentor, UCI EmpowerHER Summit (**March 2021**)
- Mentor, Chemistry Women Mentorship Network (ChemWMN) (**2020–**)
- Mentor and Advisory Board Member, GradMAP Mentoring Network- Philippines (**2020–**)