

<div>Francisco Huizar</div> <div>Data-driven drug discovery scientist</div> <div>Contact</div> <div> <div>Address</div> <div>Camarillo, CA</div> <div>Phone</div> <div>(661) 706-9931</div> <div> <div>Linked In</div> <div>ORCID</div> </div> </div> <div> <div>Work Authorization</div> <div>U.S. Citizen</div> <div>E-mail</div> <div>fhuizar@nd.edu</div> <div> <div>Google Scholar</div> <div>Personal Website</div> </div> </div>	<div>Mission statement</div> <div> <div>I am a collaborative cross-functional scientist with expertise in computational biology, mathematical modeling, science-based decision making, and interdisciplinary communication.</div> <div>The core mission of my professional endeavors is to serve patients afflicted by genetic-related disease with therapeutic approaches and innovative biotechnology in a clinical setting.</div> <div>To achieve my mission of service, I aim to utilize my talents of communication and execution to perform my passion of planning and analyzing by using data-driven approaches for drug discovery.</div> </div>
<div>Skills</div> <div>Transferable and Professional</div> <div> <div>Innovative problem solver</div> <div>Collaborate cross-functionally</div> <div>Project management</div> <div>Information, data management</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Excellent</div> <div>S.M.A.R.T. goals and objectives</div> <div>Leadership and initiative</div> <div>Professional self-awareness</div> <div>Communicate effectively</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Very Good</div> </div>	<div>Summary of qualifications</div> <div> <div>Articulate communicator with expertise in data visualization and scientific presentation resulting in 1 academic journal front cover, 14 conference and 5 seminar presentations.</div> <div>Self-motivated project manager with excellent written communication, strategic planning, innovation, and problem solving abilities resulting in 3 first-author publications, 1 first-author review, and 5 fellowships totaling in \$96,000 in funding.</div> <div>Flexible, adaptive, and versatile learner committed to professional development as evidenced by participation in 3 training workshops specific to computational modeling, pharmacometrics, single-cell genomics, computational biology, and clinical therapeutic development.</div> <div>Inspiring leader with experience to foster listening, patience, encouragement, collaborative environments, and collective success as evidenced by engagement in 2 lead mentoring training workshops, mentoring 8 undergraduate and 9 graduate students.</div> <div>Dedicated, dependable, and ethical scientist committed to integrity, reproducibility, responsibility, and accountability resulting in 3 unique discoveries in relation to drug discovery research for oncology and neurodegenerative preclinical disease modeling.</div> </div>
<div>Technical and Software</div> <div> <div>Biostatistics and data analysis</div> <div>R for biostatistics</div> <div>Python, Pandas, Matplotlib</div> <div>MATLAB and SimBiology</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Excellent</div> <div>Computational biology</div> <div>Model simulation and development</div> <div>Unix, Linux, Cloud Computing</div> <div>PyTorch, Keras, TensorFlow</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Very Good</div> </div>	<div>Professional experience</div> <div>Quantitative systems biologist, model simulation and drug discovery</div> <div> <div>As Graduate Research Assistant (Dec 2019 - Current)</div> <div>University of Notre Dame, Indiana</div> <div>Responsible for collaborative relationship building by leading 4 cross-functional teams spanning simulation techniques, drug discovery, and machine learning for application to computational biology, biostatistics, simulation, and mathematical modeling.</div> <div>Developed a Gaussian process surrogate model (PyTorch) for prediction and simulation of therapeutic viability of 1,498 compounds to 172 kinase targets for cancer research.</div> <div>Designed and developed a platform for rapid in vivo Drosophila drug development assay to evaluate up to 8 novel therapeutics per month.</div> <div>Implemented 2 machine learning approaches for de novo therapeutic design as a scientific approach for identification and simulation of new therapeutics using generative models.</div> <div>Utilized machine learning, mathematical modeling, and cloud computing for rapid simulation and data classification of 4 unique calcium signatures in developmental biology.</div> <div>Operated differential equation modeling tools to discover 2 distinct cell populations in developing epithelial tissue via simulation and analytic techniques.</div> </div>
<div> <div>SAS analytics software</div> <div>GitHub, Git, GitLFS</div> <div>MySQL, SQL, Tableau</div> <div>Mathematica</div> <div>Bayesian modeling software</div> <div>STAN, RStan, MCMC</div> <div>C++, OOP</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Experienced</div> <div>Bioinformatics, single-cell genomics</div> <div>Seurat, ScanPy, STAR and CellRanger</div> <div>AWS, Azure, GCP</div> <div>Pharmacometrics and PKDM</div> <div>Model-informed drug development</div> <div>PK/PD, pharmacology modeling</div> <div>NONMEM, Monolix, Phoenix</div> <div>NLME, WinNonLin</div> <div>Exposure-response modeling of discrete and time-to-event data</div> <div>Quantitative systems pharmacology</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div>Actively Learning!</div> </div>	<div>Computational biologist, data management and data science</div> <div> <div>As Graduate Research Assistant (Jul 2018 - Dec 2019)</div> <div>University of Notre Dame, Indiana</div> <div>Participated in cross-function teams to collaborate with other scientists that led to development of a cloud computing project to manage datasets consisting of 13,324 images.</div> <div>Deployed bioinformatics, data processing, and data science methods for analysis of phenomic datasets to identify 4 lead therapeutic candidates using Python and MATLAB.</div> <div>Performed in vivo gene expression of 425 human disease related genes in Drosophila Melanogaster</div> <div>Spearheaded design and innovation of a more efficient coverslip plating protocol for in vivo calcium signaling imaging that increased throughput by a factor of 2.</div> <div>Hands-on experience and innovation in data democratization by generating biotechnology modeling software for utilization of packages by non-technical users as demonstrated by 2 open-source repositories for biological simulation and biostatistics.</div> </div>
	<div>Training and education</div> <div> <div>Ph.D., Bioengineering</div> <div>University of Notre Dame</div> <div>Jul 2018 – Current</div> <div>M.S., Computational Statistics</div> <div>University of Notre Dame</div> <div>Jul 2018 – Current</div> <div>B.S., Chemical and Biomolecular Engineering</div> <div>University of Notre Dame</div> <div>Aug 2013 – May 2018</div> <div>B.S., Computational Statistics</div> <div>University of Notre Dame</div> <div>Aug 2013 – May 2018</div> </div>

Honors and awards

• Berthiaume Institute for Precision Health Summer Graduate Research Fellowship	May 2022 – Aug 2022
• 10 th Annual Harper Cancer Research Institute Research Day Presentation Moderator	Mar 2022
• Notre Dame CBE Lead Graduate Student Mentor	Jan 2022 – Current
• Harper Cancer Research Institute Interdisciplinary Interface Training Program Grant	Jul 2020 – Jul 2022
• Leahy-Filipi Graduate Fellowship for excellence in neuroscience research	May 2020 – May 2021
• Notre Dame Annual Building Bridges Reception Keynote Speaker	Sep 2019
• Harper Cancer Research Institute Research Day Oral Presentation Award	Apr 2019
• Stem Cells & Regenerative Medicine Research Fellowship	May 2017 – Aug 2017
• Notre Dame CBE Early Start Fellowship	Jul 2018 – Aug 2018
• Provost Scholarship for academic achievement	Aug 2013 – May 2017
• Kaneb-Gillen Hispanic Scholar for academic achievement	Aug 2015 – May 2017

Publications

Kumar, N., **†Huizar, F.J.**, Farfán-Pira K.J., Brodskiy, P., Soundarrajan, D.S., Nahmad, M., Zartman, J.J.; MAPPER: An open-source, high-dimensional image analysis pipeline unmasks differential regulation of *Drosophila* wing features. *Frontiers in Genetics* (2022). <https://doi.org/10.3389/fgene.2022.869719>.

†Co-first authorship.

Huizar, F.J., Hill, H., Bacher, E., Eckert, K., Gulotty, E., Rodriguez, K., Tucker, Z., Banerjee, M., Wiest, O., Zartman, J. and Ashfeld, B.L. (2022), Rational Design and Identification of Harmine-Inspired, N-Heterocyclic DYRK1A Inhibitors Employing a Functional Genomic In Vivo *Drosophila* Model System. *ChemMedChem*. (2022). <https://doi.org/10.1002/cmdc.202100512>

Soundarrajan, D., **†Huizar F.J.**, Paravitorghabeh, R., Robinett, T., Zartman, J. (2021), From spikes to intercellular waves: Tuning intercellular calcium signaling dynamics modulates organ size control. *PLOS Computational Biology*. 2021 Nov 1;17(11):e1009543. <https://doi.org/10.1371/journal.pcbi.1009543> **†Co-first authorship.**

Huizar, F.J., Soundarrajan, D., Paravitorghabeh, R., Zartman, J.J., Interplay between morphogen-directed positional information systems and physiological signaling. *Developmental Dynamics*. 2020; 249: 328– 341. <https://doi.org/10.1002/dvdy.140>

Kumar, N., **Huizar, F.J.**, Unger, M., Soundarrajan, D., Velagala, V., Koren, J., Zartman, J.J. (2020). Neurotransmitter Receptors as Key Physiological Regulators of Epithelial Morphogenesis. *Biophysical Journal*. <https://doi.org/10.1016/j.bpj.2019.11.673>

Brodskiy, P.A., Wu, Q., Soundarrajan, D.K., **Huizar, F.J.**, Chen, J., Liang, P., Narciso, C., Levis, M., Arredondo-Walsh, N., Chen, D., Zartman, J.J. (2019). Decoding calcium signaling dynamics during *Drosophila* wing disc development. *Biophysical Journal*. <https://doi.org/10.1016/j.bpj.2019.01.007>

Brodskiy, P.A., Wu, Q., Kumar, N. Velagala, V. Snyder, K. **Huizar, F.J.**, Tautges, S., Snyder. M, Zartman J.J. (2018). Mapping the calcium signalsome during *Drosophila* wing development. *IFAC-PapersOnLine*. <https://doi.org/10.1016/j.ifacol.2018.09.019>

Brodskiy, P. A., Wu, Q., **Huizar, F. J.**, Soundarrajan, D. K., Narciso, C., Levis, M., ... Zartman, J. J. (2017). Intercellular calcium signaling is regulated by morphogens during *Drosophila* wing development. *bioRxiv*, 104745. *Pre-print*. <https://doi.org/10.1101/104745>

Conference and seminar presentations

Huizar, F.J. et al., "Flying" over pre-clinical barriers: Machine learning approaches to characterize novel DYRK1A inhibitors as potential cancer therapeutics. **Notre Dame Quantitative Biology Retreat**. Poster. April 08, 2022.

Huizar, F.J. et al., "Flying" over pre-clinical barriers: Machine learning approaches to characterize novel DYRK1A inhibitors as potential cancer therapeutics. **Cancer Research Institute Cancer Research Day**. Selected graduate student presenter. Poster. March 14, 2022.

- Huizar, F.J. et al.**, "Flying" over pre-clinical barriers: Development of a rapid, low-cost platform for pre-clinical evaluation of novel therapeutics in vivo. **Notre Dame Bioengineering Seminar**. Main speaker. Multidisciplinary Research Building, Notre Dame, IN. Nov 18, 2021.
- Huizar, F.J.**, Hill, H., Kumar, N., Bacher, E., Ashfeld, B., Zartman, J.J., Rational Design and Identification of N-Heterocyclic DYRK1A Inhibitors as Potential Anticancer Therapeutics. **Cancer Biology Training Consortium annual retreat**. Poster. Graduate Hotel Nashville. Nashville, TN. Oct 25, 2021.
- Huizar, F.J.**, Hill, H.M., Bacher, E.P., Eckert, K.E., Gulotty, E.M., Rodriguez, K.X., Tucker, Z.D., Wiest, O., Zartman, J., Ashfeld, B.L., Novel N-heterocyclic DYRK1A inhibitors ameliorate overgrowth of epithelial tissue. **IU Simon Comprehensive Cancer Center Cancer Research Day**. Presentation. Online. October 14, 2021.
- Huizar, F.J.**, Using a black hole to identify novel therapeutics: SVGP regression as a statistical framework for drug discovery. **Notre Dame Bioengineering Seminar**. Main speaker. Online. June 22, 2021.
- Huizar, F.J.**, Kumar, N., Robinett, T., Farfan-Pira K.J., Soundarrajan, D., Unger, M., Brodskiy, P., Nahmad, M., Zartman, J.J., MAPPER: A new image analysis pipeline unmasks differential regulation of *Drosophila* wing features. **Genetics Society of America annual Drosophila research conference**. Poster. Online. March 31, 2021.
- Huizar, F.J.**, Hill, H., Kumar, N., Bacher, E., Ashfeld, B., Zartman, J.J., In vivo drug discovery “on-the-fly”: Towards high-throughput assessment of novel therapeutics in humanized *Drosophila melanogaster*. **Harper Cancer Research Institute Cancer Research Day**. Selected graduate student presenter. Online. March 29, 2021.
- Huizar, F.J.**, Hill, H., Kumar, N., Bacher, E., Ashfeld, B., Zartman, J.J., In vivo drug discovery “on-the-fly”: Towards high-throughput assessment of novel therapeutics in humanized *Drosophila melanogaster*. **Cancer Biology Training Consortium annual retreat**. Poster. Online. Oct 27, 2020.
- Huizar, F.J.**, Hill, H., Kumar, N., Bacher, E., Ashfeld, B., Zartman, J.J., In vivo drug discovery “on-the-fly”: Towards high-throughput assessment of novel therapeutics in humanized *Drosophila melanogaster*. **Notre Dame Bioengineering Seminar**. Main speaker. Multidisciplinary Research Building, Notre Dame, IN. Sep 29, 2020.
- Maini, P., **Huizar F.J.**, Oliveri, H., Baraban, M., Kumar, N., Parel, K., Telele. C., Modeling shape & size in biological multicellular tissues. Workshop Presentation. **Lorentz Center modeling biological development workshop**. Online. Aug 28, 2020.
- Huizar, F.J.**, Bacher, E., Kumar, N., Gleason, B., Koren, J., Ashfeld, B., Zartman, J.J., Regulation of DYRK1A activity through an integrated inhibitor scaffold design and phenotypic analysis approach. Poster. **7th Annual AD&T Symposium: Extreme Diagnostics**, Notre Dame, IN. Mar 6, 2020.
- Huizar, F.J.**, Wu, Q., Tautges, S., Eckert, K., Bacher, E., Ashfeld, B., Zartman, J.J., Toward a high-throughput *in vivo* screening pipeline for testing new therapeutics using *Drosophila melanogaster* as a disease-model. **Eli Lilly and Company HCRI Notre Dame Alumni Panel**. Poster. Eli Lilly and Company Headquarters, Indianapolis, IN. May 17, 2019.
- Huizar, F.J.**, *Drosophila melanogaster* as a high-throughput model for drug screening and decoding G-protein coupled receptor interactions. **Notre Dame Bioengineering Seminar**. Main speaker. Multidisciplinary Research Building, Notre Dame, IN. Apr 12, 2019.
- Huizar, F.J.**, Bacher, E., Wu, Q., Tautges, S., Kumar, N., Ashfeld, B., Zartman, J.J., A high-throughput *in vivo* screening pipeline for testing novel DYRK1A inhibitors against triple negative breast cancer using *Drosophila melanogaster* as a disease model. **8th Annual HCRI Cancer Research Day**. Selected Presenter. Harper Cancer Research Institute, South Bend, IN. Apr. 8, 2019.
- Huizar, F.J.**, Wu, Q., Tautges, S., Eckert, K., Bacher, E., Ashfeld, B., Zartman, J.J., Toward a high-throughput *in vivo* screening pipeline for testing new therapeutics using *Drosophila melanogaster* as a disease-model. **8th Annual HCRI Cancer Research Day**. Poster. Harper Cancer Research Institute, South Bend, IN. Apr 8, 2019.
- Huizar, F.J.**, Mechanisms of serotonin (5-HT) signaling in development. **Harper Cancer Research Institute Seminar**. Main speaker. Harper Cancer Research Institute, South Bend, IN. Feb 4, 2019.

Huizar, F.J., Wu, Q., Brodskiy, P.A., Zartman, J.J., Regulation and relevance of intercellular calcium signaling. Poster. **Notre Dame College of Science Joint Annual Meeting**, Notre Dame, IN. May 4, 2018.

Huizar, F.J., Levis, M., Zartman J.J., *In vivo* analysis of spontaneous intercellular Ca²⁺ waves in *Drosophila* wing discs. Poster. **5th Midwest Quantitative Biology Symposium**, Notre Dame, IN. Apr 8, 2017.

Research interests

- Translation and clinical research for genetic-related diseases
- Genetic engineering approaches to generate in vivo model organisms
- Drug Development, pharmacodynamics, and pharmacokinetics
- Scientific computing and machine learning approaches in bioinformatics
- Gene regulatory network modeling
- Phenomics, proteomics, and genomics association analysis

Affiliations

- American Institute of Chemical Engineers (AIChE)
- Notre Dame CBE graduate student organization mentor
- Notre Dame MSPS Building Bridges Mentoring Program
- Notre Dame Hispanic Scientists and Engineers
- Notre Dame CBE First-Year Graduate Student Peer Group Program (Mentor)
- Notre Dame Leadership Advancing Socially Engaged Research (Graduate Mentor)