# IVAN A. VALDEZ, PhD

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## PROFESSIONAL SUMMARY

Islet biologist and translational scientist developing clinically relevant frameworks for early detection and staging of type 2 diabetes (T2D). Research integrates mechanistic islet biology, quantitative metabolic phenotyping, and human population validation to study how coordinated endocrine dysfunction emerges before overt hyperglycemia. Developed a multi-axis staging framework designed to detect structured metabolic dysfunction and organ-level risk prior to the onset of current conventional glucose-based criteria. Current program spans mechanistic studies of persistent beta-cell lipotoxic stress, historical and conceptual synthesis of islet coordination failure, human full-spectrum validation in NHANES, and cross-species translation in mouse models. Three U.S. provisional patents filed in 2026.

## EDUCATION

**University of Texas Southwestern Medical Center** Dallas, TX | 2022–2026
*Doctor of Medicine (MD Program)*

- **Presidential Scholarship** — full-ride, merit-based; awarded to 10-20 of 255 students.
- Completed preclinical curriculum and clinical clerkships; withdrew to pursue a research career, relocate to San Diego.

**Harvard University, Graduate School of Arts and Sciences** Cambridge, MA | 2010–2016
*Doctor of Philosophy (PhD), Biological and Biomedical Sciences*

- Dissertation research at Harvard Medical School / Joslin Diabetes Center under Rohit N. Kulkarni, MD, PhD. Investigated inflammatory signaling mechanisms driving islet cell plasticity and beta-cell identity.
- NIH F31 Predoctoral Fellowship (PI); Sternlicht Director's Fund Award, Harvard Stem Cell Institute.

**University of Texas at Brownsville / Texas Southmost College** Brownsville, TX | 2007–2010
*Bachelor of Science, Biology, Summa Cum Laude*

- **Scorpion Scholar Scholarship** — full-ride, merit-based.

## CURRENT RESEARCH

**Islet Network Coordination & Early Detection of T2D | Independent** 2026–present

- Leading a multi-manuscript research program that reframes type 2 diabetes as progressive islet coordination failure and develops quantitative tools for earlier detection and staging; human validation in NHANES III
- Mechanistic mouse studies, historical/conceptual synthesis, human validation, and cross-species translational work.
- Three provisional U.S. patents filed (March–April 2026) covering the framework and related embodiments.

## RESEARCH EXPERIENCE

**Medical Researcher | Philipp E. Scherer, PhD**
*UT Southwestern Medical Center, Touchstone Diabetes Center | Dallas, TX | 2022–2026*

- Investigated adipose–islet crosstalk and endocrine communication in metabolic disease, with emphasis on how extra-islet signals shape islet stress, compensation, and dysfunction. This work helped shape the broader conceptual foundation of the islet coordination program.

**Postdoctoral Fellow | Ralph A. DeFronzo, MD**
*UT Health San Antonio, Texas Diabetes Institute | San Antonio, TX | 2019–2022*

- Investigated beta-cell dysfunction in T2D and identified persistent inflammatory lipotoxicity as a driver of impaired insulin secretion despite correction of glucotoxicity, supporting the broader concept that glucose normalization alone may not restore islet health; mentored multiple PhD and MD trainees.

**Doctoral Researcher | Rohit N. Kulkarni, MD, PhD**
*Harvard Medical School, Joslin Diabetes Center | Boston, MA | 2010–2016*

- Discovered inflammatory cytokines drive ductal-to-endocrine cell reprogramming via STAT3-dependent NGN3 activation—mechanistic link between pancreatic inflammation and β-cell regeneration.
- First-author publications in Science Translational Medicine and Cell Reports; co-author in Cell Metabolism and Nature Communications. NIH F31 Fellowship (PI). Oral presentations at ADA Scientific Sessions and Keystone Symposia.

**Summer Research Intern | Randi Silver, PhD** New York, NY | 2009
*Weill Cornell Medical College*
- Investigated mast cell–fibroblast interactions in cardiac fibrosis and tissue remodeling.

**Undergraduate Researcher | Luis Colom, MD, PhD** Brownsville, TX | 2008–2010
*University of Texas at Brownsville*
- Examined amyloid-beta neurotoxicity in a rat model of Alzheimer's disease.

## PUBLICATIONS

1. Ayala I, et al., including **Valdez IA**. The Spatial Transcriptional Activity of Hepatic TCF7L2 Regulates Zonated Metabolic Pathways. Nat Commun 16(1): 3408 (2025).
2. **Valdez IA**, et al. Persistent Inflammatory Lipotoxicity Impedes Pancreatic β-cell Function in Diet-Induced Obese Mice. bioRxiv (2022). [Preprint]
3. Shannon CE, et al., including **Valdez IA**. Insulin Resistance is Mechanistically Linked to Hepatic Mitochondrial Remodeling in NAFLD. Mol Metab 45: 101154 (2021).
4. Merovci A, et al., including **Valdez IA**. Effect of Mild Physiologic Hyperglycemia on Insulin Secretion, Clearance, and Sensitivity. Diabetes 70(1): 204–213 (2021).
5. Loo LSW, et al., including **Valdez IA**. Dynamic Proteome Profiling of Human Pluripotent Stem Cell-Derived Pancreatic Progenitors. Stem Cells (2019).
6. Gupta MK, et al., including **Valdez IA**. Insulin Receptor-Mediated Signaling Regulates Pluripotency Markers and Lineage Differentiation. Mol Metab 18: 153–163 (2018).
7. **Valdez IA**, et al. Proinflammatory Cytokines Induce Endocrine Differentiation in Pancreatic Ductal Cells via STAT3-Dependent NGN3 Activation. Cell Rep 15(3): 460–470 (2016).
8. Teo AK, et al., including **Valdez IA**. Early Developmental Perturbations in a Human Stem Cell Model of MODY5/HNF1B Pancreatic Hypoplasia. Stem Cell Reports 6(3): 357–367 (2016).
9. **Valdez IA**, et al. Cellular Stress Drives Pancreatic Plasticity. Sci Transl Med 7(273): 273ps2 (2015).
10. Bhatt S, et al., including **Valdez IA**. Preserved DNA Damage Checkpoint Pathway Protects Against Complications in Long-Standing T1D. Cell Metab 22(2): 239–252 (2015).
11. Teo AK, et al., including **Valdez IA**. Comparable Generation of Activin-Induced Definitive Endoderm via Additive Wnt or BMP Signaling. Stem Cell Reports 3(1): 5–14 (2014).

## CONFERENCES & PRESENTATIONS

**Dissociating the effects of glucotoxicity and lipotoxicity on pancreatic islets from diet induced obese mice** 2021
***Ivan A. Valdez**, Terry M. Bakewell1, Chris E. Shannon, Marcel Fourcaudot, Irsicilla Ayala, Ralph DeFronzo, Luke Norton*
- New England Virtual SACNAS Regional Meeting, hosted by Harvard University

**Pro-inflammatory stress stimulates endocrine progenitor activation in pancreatic cells** 2014-16
***Ivan A. Valdez**, Adrian Teo, Ercument Dirice, Manoj K. Gupta, Jun Shirakawa, Rohit N. Kulkarni*
- American Diabetes Association, 76th Scientific Sessions, New Orleans, LA
- 2nd BBDC-Joslin-UCPH conference, Copenhagen, Denmark
- American Diabetes Association, 75th Scientific Sessions, Boston, MA
- Emerging Concepts and Targets in Islet Biology, Keystone, CO

**Expression of Histamine H1R and ANG II AT1R in Cardiac Fibroblasts: Role of Collagen Expression** 2009-10
***I.A. Valdez**, A.C. Reid, N.O'Connor, J. Brazin, A. Veerappan, A. Jung, R. B. Silver*
- ABRCMS National Conference, Phoenix, AZ
- SACNAS National Conference, Dallas, TX
- The Leadership Alliance National Symposium, Chantilly, VA
- Weill Cornell/Sloan Kettering/Rockefeller Summer Research Symposium, New York, NY

## RESEARCH GRANTS & FUNDING

**American Diabetes Association Postdoctoral Fellowship (PI)** 2019–2021
- Funded research on glucolipotoxicity and beta-cell function (2 publications).

**National Institutes of Health, F31 Predoctoral Fellowship (PI)** 2013–2015
*Grant #: F31 DK098931*
- Supported PhD research on induced pluripotent stem cells and type 1 diabetes.

**Harvard Stem Cell Institute, Sternlicht Director's Fund Award** 2011–2012
- Funded PhD research; awarded to only 2 researchers.

## TEACHING, LEADERSHIP & COMMUNITY SERVICE

**College Admissions Interviewer | Harvard College** 2021–Present
- Conduct 3–4 applicant interviews annually for admissions in South Texas.

**Science Mentor | HPREP (Health Professions Recruitment & Exposure Program)** 2014 | 2023
- Guided high school students on STEM careers and college applications (Boston, Dallas).

**Research Mentor | UT Health San Antonio** 2019–2021
- Mentored 4 undergraduate, PhD, and MD/PhD students, leading to conference presentations.

**Premed Advisor | Independent** 2022–Present
- Supporting students through medical school applications and interviews.

**College Admissions Interviewer: Harvard College** 2021-Present
- Interviewed high school students from the Rio Grande Valley interested in STEM careers

**Qualified Scientist:** Faulk Middle School science fair 2019
- Review and approve students' proposed science fair projects

**Science Communication: Dr. Juliet Garcia's "Next Generation" local radio station** 2018-19
- Invited twice to speak to the University of Texas RGV community about a career in science

**Co-director of communications:** Harvard Biotechnology Club 2015-16
- Organized and published list of weekly biotech events and job opportunities for Harvard students

**Admissions committee:** Harvard Stem Cell Institute (HSCI) 2012
- Served as 1 of only 2 students in HSCI's Summer Research Program committee of 12 members

**Science teacher**: Harvard Medical School-Kindling Interest in Doing Science (HMS-KIDS) 2011
- Designed class curriculum and taught summer school to a group of 20-30 students in Boston public school

**Steering committee:** Minority Biomedical Students of Harvard (MBSH) 2010-15
- Served as Steering Committee member for 5 years and helped coordinate:
  - 2 annual symposiums, 5 panel discussions, 10 fall & spring semester kickoffs for students & post-docsz

## FUNDING STRATEGY (IN PREPARATION)

- **ADA Pathway to Stop Diabetes® Initiator Award** — early-career award for innovative diabetes research (requires institutional nomination); target 2027 cycle.
- **NIH K99/R00 Pathway to Independence Award (NIDDK)** — mentored-to-independent transition mechanism; target submission 2027 upon institutional affiliation.
- **NIH R21 Exploratory/Developmental Grant** — prospective validation of the coordination framework in a clinical cohort; target submission 2027–2028.

## INTELLECTUAL PROPERTY

- U.S. Provisional Patent (Serial No. 64/006,516): Islet Coordination Score — Methods for Quantifying Pancreatic Islet Network Coordination. Filed March 16, 2026.
- U.S. Provisional Patent (Integrated Continuation): ICS Expanded Embodiments Including Bihormonal Glucagon Framework. Filed March 21, 2026.
- U.S. Provisional Patent (Third Filing): Five-Axis ICS, Dedifferentiation Mechanism, and NHANES III Validation.

## ADDITIONAL EXPERIENCE

**Senior Analyst, Healthcare & Medical Device Strategy Consulting** Boston, MA | 2016–2019
*Fletcher Spaght Inc.*
- Delivered strategic recommendations and competitive intelligence to C-suite executives at biotech, medtech, and diagnostics companies.
- Bilingual scientific communication (English/Spanish); led Latin American KOL engagements independently.