CURRICULUM VITAE

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Office Address:
University of Colorado Anschutz Medical Campus
Department of Medicine
Division of Renal Diseases and Hypertension
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LANGUAGES

English and Spanish

EDUCATION

Ph.D. Graduate Student **August 2006 – December 2012**
Department of Chemistry and Biochemistry and Biofrontiers Institute
University of Colorado at Boulder
Boulder, CO 80309
Advisor: Dr. Amy E Palmer

Masters Graduate Student **July 2004 – August 2006**
Department of Biological Sciences
California State University, Los Angeles
5151 State University Drive
Los Angeles, CA 90032
Advisor: Dr. Phillip S LaPolt

Bachelor of Science in Biology **September 2000 – May 2004**
Department of Biological Sciences
University of California, Irvine
Irvine, CA 92697
Advisor: Dr. Ricardo Miledi

RESEARCH EXPERIENCE

Research Instructor **July 2023 – Present**
Department of Medicine
Division of Renal Diseases and Hypertension
University of Colorado Anschutz Medical Campus
Laboratory: Dr. Makoto Miyazaki
Using confocal microscopy I am testing how transmembrane proteins cause the degradation of specific transporters using cells of the proximal tubule of the nephron. This testing is being conducted using confocal microscopy imaging by testing degradation using specific pharmacological reagents as well as phosphates. Visualization of these probes is done by transiently transfected genetically encoded probes tagged with fluorescent proteins.

Research Instructor **September 2021 – May 2023**
Department of Bioengineering
University of Colorado Anschutz Medical Campus
Barbara Davis Center for Diabetes
Laboratory: Dr. Richard KP Benninger
Knocking-down nuclear factor of activated T-Cell (NFAT) subunits (c1-c4) and neuronal PAS domain protein 4 (Npas4) in mouse insulinoma MIN6 cell line and testing how it affects specific down-stream genes involved in insulin granule formation, insulin secretion, and connexin-36 (Cx36) gap junction.

Post-Doctoral Research Fellow **January 2016 – August 2021**
Department of Bioenigeering
University of Colorado Anschutz Medical Campus
Barbara Davis Center for Diabetes
Advisor: Dr. Richard KP Benninger
Research: To focus on applying quantitative fluorescent microscopy techniques, including FRET imaging of biomolecular interactions and metabolic pathways diabetes. In addition, developing applications of optogenetics to control electrical excitability in mice islets to look at Ca^{2+} changes.

Post-Doctoral Research Fellow **July 2013 – December 2015**
Department of Pharmacology
University of Colorado Anschutz Medical Campus
Advisor: Dr. Chandra Tucker
Research: I worked on reducing dark-state dimerization of the Cryptochrome-2 (CRY2) photoactivatable plant receptor. This was done through site-directed mutagenesis, yeast-2-hybrid, and live cell fluorescence microscopy.

Post-Doctoral Research Fellow **January 2013 – July 2013**
Department of Chemistry and Biochemistry
University of Colorado at Boulder
Advisor: Dr. Amy E Palmer
Research: To quantify free zinc levels in normal and prostate cancerous cells using nuclear and cytosolic targeted genetically encoded FRET sensors. The free zinc levels were correlated with apoptotic and proliferation assay as well as determining the protein expression levels of total Caspase-3 and cleaved Caspase-3.

Dissertation Research **March 2007 – December 2012**
Department of Chemistry and Biochemistry
University of Colorado at Boulder
Advisor: Dr. Amy E Palmer
Dissertation: "Elucidating Zinc Distribution In Cancerous prostate Cells Using novel FRET Sensors"
My dissertation project was focused on defining the differences in total zinc levels in normal and cancerous prostate cells. I developed a small family of green-red FRET sensors to monitor zinc dynamics in two compartments of the same cell as well as identifying a superior green-red sensor that is not quench under acidic conditions such as vesicles.

RESEARCH SKILLS

FRET Microscopy Techniques (wide-field & confocal), live cell imaging, mammalian cell culture, transfecting cDNA, RT-PCR and qPCR, RNAseq, molecular cloning, SDS Gel and Western Blotting, Protein Purification, Affinity Chromatography, Site-Directed Mutagenesis, Yeast-2-Hybrid, Yeast Imaging, Image Analysis, Immunohistochemistry, Inductive Coupled Plasma-Mass Spectrometry, X-Ray Fluorescence Microscopy, Optogenetics, Cell Fractionation, Isolation of Mice Pancreatic Islet, Islet imaging, Viral production (lentivirus, adenovirus, and AVV), viral transduction

PROFESSIONAL AND TEACHING EXPERIENCES

University of Colorado at Denver **2022 – Present**
Department of Integrative Biology
Instructor: Human Physiology and Biology of Cancer

University of Colorado at Boulder **2009**
Department of Molecular and Cellular Biology
Colorado Diversity Initiative, NIH Minority Student Workshop
"Central Dogma of Molecular Biology"

Journal Club Instructor **January 2008 – May 2008**
Molecular, Cellular, and Developmental Biology Department
University of Colorado at Boulder
Lead a group of undergraduate students in the National Institutes of Health Scholars Program to discuss and interpret current published research

Laboratory Instructor, Introduction to General Chemistry **August 2006 – December 2006**
Department of Chemistry and Biochemistry
Lead undergraduate chemistry laboratory sections for non-science majors

HONORS AND AWARDS

Ruth L. Kirschstein National Research Service Award **2011 – 2012**
Department of Health and Human Services
National Institutes of Health
National Institute of General Medical Sciences

Federation of American Societies for Experimental Biology (FASEB) **2010**
Minority Access to Research Careers (MARK) Travel Award
Trace Elements in Biology and Medicine
Snowmass Village, CO

CARL Storm Underrepresented Minority Fellowship **2009**
Gordon Research Conference in Salve Regina University
2009 Cell Biology of Metals

Adopt-A-Student Award **2007 – 2011**
Department of Chemistry and Biochemistry
University of Colorado at Boulder

PRESENTATIONS

University of Colorado Anschutz Medical Campus **2021**
Department of Bioengineering
Barbara Davis Center for Diabetes Research in Progress
“Regulation of gap junctions via electrical activity”

University of Colorado Anschutz Medical Campus **2019**
Department of Bioengineering
Barbara Davis Center for Diabetes Research in Progress
"β-cell electrical activity increases NFATc3 activation and modulates gene expression”

University of Colorado Anschutz Medical Campus **2018**
Department of Bioengineering
Barbara Davis Center for Diabetes
Postdoctoral Association Seminar Series
“Nuclear Factor of Activated T-cell (NFAT) regulation in Healthy and Type II Diabetic β-cells”

University of Colorado Anschutz Medical Campus **2018**
Department of Bioengineering
Barbara Davis Center for Diabetes, Diabetes Day
“*NFAT regulation in β-cell dysfunction"*

University of Colorado Anschutz Medical Campus **2016**
Department of Bioengineering
Barbara Davis Center for Childhood Diabetes Research in Progress
"Calcineurin: A Force for Good or Bad?

University of Colorado at Boulder **2012**
Department of Chemistry and Biochemistry
Signal and Cellular Regulation Annual Symposium
"Characterization of zinc distribution in noncancerous and cancerous prostate cell lines"

University of Colorado at Boulder **2010**
Department of Chemistry and Biochemistry Annual Retreat
"Tools for live cell imaging: tracking metal ions in cells"

University of Colorado at Boulder **2009**
Department of Chemistry and Biochemistry Annual Retreat
"Developing tools for live cell imaging: tracking metal ions in cells"

POSTERS

Keystone Symposia **2018**
Islet Biology and Diabetes
Keystone, CO
"NFAT regulation in β-cells dysfunction"

Federation of American Societies for Experimental Biology **2010**
Trace Elements in Biology and Medicine
Snowmass Village, CO
"Characterization hZIP1, ZnT1, and ZnT4 zinc transporters in noncancerous and cancerous prostate cells"

Gordon Research Conference **2009**
Cell Biology of Metals
Salve Regina University
"Characterization of noncancerous and cancerous prostate cells"

PUBLICATIONS

1. Activation of the IKK2-NFkB pathway in VSMCs inhibits calcified vascular stiffness in CKD by reducing the secretion of calcifying extracellular vesicles. Miyazaki-Anzai S, Masuda M, **Miranda JG**, Keenan AL, Shiozaki Y, and Miyazaki M (**Manuscript in Review JCI Insight**)
2. St Clair J, Westacott MJ, **Miranda JG**, Farnsworth NL, Kravets V, Schleicher WE, Heintz A, Ludin NWF, Benninger RKP. "Restoring Connexin-36 Function in Diabetogenic Environment Precludes Mouse and Human Islet Dysfunction and Beta-Cell Death." J Physiol. 2023 Sep;601(18):4053-4072.doi: 10.1113/JP282114. Epub 2023 Aug 14.
3. Farnsworth NL, Piscopio RA, Schleicher WE, Ramirez DG, **Miranda JG**, Benninger RKP. Modulation of Gap Junction Coupling Within the Islet of Langerhans During the Development of Type 1 Diabetes. Front Physiol. 2022 Jun 28.
4. Kim YK, Walter J, Moss ND, Wrasma KL, Sheridan R, **Miranda JG**, Benninger RKP, O'Brien RM, Sussel L, & Davidson HW. Zinc Transporter 8 Haploinsufficiency Protects Against Beta Cell Dysfunction in Type 1 Diabetes by Increasing Mitochondrial Respiration. Mol Metab. 2022 Dec.
5. **Miranda JG,** Schleicher WE, Wells-Wrasman K, Ramirez DG, Landgrave SP, & Benninger RKP. Dynamic changes in β-cell [Ca^{2+}] regulate NFAT activation, gene transcription and islet gap junction communication. Mol Metab. 2021 Dec 31.
6. Corezola do Amaral MA, Kravetz V, Dwulet JM, Farnsworth NL, Piscopio R, Schleicher WE, **Miranda JG**, Benninger RKP. Caloric restriction recovers impaired β-cell-β-cell gap junction coupling, calcium oscillation coordination, and insulin secretion in prediabetic mice. *Am J Physiol Endocrinol Metab.* 2020 Aug 24.
7. Taslimi, R, Zoltowski, B, **Miranda, JG,** Pathak, G, Hughes, RM, & Tucker, CL. Optimized second generation CRY2/CIB optical dimerizers and photoactivatable Cre recombinase. *Nat Chem Biol.* 2016 Apr 11.
8. Palmer AE, **Miranda JG**, Carter KP. Zinc: Fluorescent Sensors. *Encyclopedia of Inorganic and Bioinorganic Chemistry*. 5 Dec 2013. 1-14.

9. Qin Y, **Miranda JG**, Stoddard CI, Dean KM, Galati DF, & Palmer AE. Direct comparison of a genetically encoded sensor and small molecule indicator: implications for quantification of cytosolic Zn^{2+}. *ACS Chem Biol*. 2013 Nov 15;8(11):2366-71.
10. **Miranda JG**, Weaver AL, Qin Y, Park JG, Stoddard CI, Lin MZ, Palmer AE. New alternately colored FRET sensors for simultaneous monitoring of Zn^{2+} in multiple cellular locations. *PLoS One*. 2012 Nov 16.
11. Old WM, Shabb JB, Houel S, Wang H, Couts KL, Yen CY, Litman ES, Croy CH, Meyer-Arendt K, **Miranda JG**, Brown RA, Witze ES, Schweppe RE, Resing KA, Ahn NG. Functional proteomics identifies targets of phosphorylation by B-Raf signaling in melanoma. *Mol Cell*. 2009 Apr 10;34(1):115-31.
12. Dittmer PJ, **Miranda JG**, Gorski JA, Palmer AE. Genetically encoded sensors to elucidate spatial distribution of cellular zinc. *J Biol Chem*. 2009 Jun 12;284(24):16289-97.

PATENTS

1. Dittmer PJ, **Miranda JG**, Palmer AE. Genetically Encoded, Targetable FRET-Based Zn^{2+} Sensors. University of Colorado Pat CU2135B, Jan 2009.

RELATED PROFESSIONAL EXPERIENCE

Internal:

Undergraduate Research Opportunities Program (UROP) **Summer 2017**
University of Colorado at Boulder
Introducing basic research experiences, undergraduate summer program

Child Health Summer Research Internship Program **Summer 2016**
Anschutz Medical Campus/Barbara Davis Center for Diabetes
Introducing basic research experiences, undergraduate summer program

Summer Undergraduate Research Fellowship (SURF) Program **Summer 2014**
Department of Pharmacology
Mentor to underrepresented minority in research interested in attending graduate school

Graduate Student Mentor **2009 – 2011**
University of Colorado at Boulder
Bioscience Undergraduate Research Skills and Training (BURST) Program
Mentor University of Colorado students interested in attending graduate school

Graduate Student Mentor **August 2009**
University of Colorado at Boulder
Leadership Alliance National Symposium
Assist SMART students prepare poster and oral presentation as well as moderate and judge poster and oral presentations

Graduate Student Mentor **Summer's 2007 – 2012**
University of Colorado at Boulder
Summer Multicultural Access to Research Program (SMART)
Mentor underrepresented minorities interested in attending graduate school

External:

SMART and Graduate School Recruitment **2009**
California State University, Los Angeles
Overview of SMART Summer Program and Biochemistry and MCDB Graduate Programs

Graduate Student Recruitment **November 2008**
Society for the Advancement of Chicanos and Native Americans (SACNAS)
Attended conference to recruit underrepresented minorities to the University of Colorado's SMART Program and graduate programs as well as serve as Biochemistry poster sessions judge

Graduate Student Recruitment **October 2007**
Annual Biomedical Research Conference for Minority Students (ABRCMS)
Attended conference to recruit underrepresented minorities to the University of Colorado's SMART Program and graduate programs