

MARIO (ALEX) MIRANDA

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CURRENT POSITION

Postdoctoral Fellow

Department of Developmental Biology, Stanford University
Lab of Seung K. Kim

October 2021-
Stanford, CA

HONORS and AWARDS

T32 Training Grant, NIH NIA, Stanford University	2022-
F31 Fellowship, NIH NIDDK, Washington University	2020-21
Sigma Xi Research Honor Society (Nominated)	2020
Edward A. Bouchet Graduate Honor Society	2019
Society for Advancement of Chicanos/Hispanics and Native Americans in Science	2019
T32 Training Grant, NIH NIDDK, Washington University	2018-20
T32 Training Grant, NIH NIGMS, Washington University	2016-18
NSF Graduate Research Fellowship Honorable Mention, Washington University	2016
IMSD Associate Scholar, Washington University	2015
CSCAA Scholar All-American Award, Trinity University	2011
President's Scholarship, Trinity University	2008-12

EDUCATION

Developmental, Regenerative, and Stem Cell Biology PhD Program

Washington University in St. Louis
GPA: 3.91

2015-2021
St. Louis, MO

Bachelor of Science in Biology

Trinity University

2008-2012
San Antonio, TX

PUBLICATIONS

Miranda MA, Macias-Velasco JF, Schmidt H, Lawson HA. Integrated transcriptomics identifies β -cell subpopulations and genetic networks associated with obesity and glycemic control in SM/J mice. *bioRxiv*. 2021 Jul 15; doi: <https://doi.org/10.1101/2021.07.15.452524>

Miranda MA, Macias-Velasco JF, Lawson HA. Pancreatic β -cell heterogeneity in health and diabetes: Classes, Sources, and Subtypes. *American Journal of Physiology - Endocrinology and Metabolism*. 2021 Apr 1;320(4):E716-E731. PMID: 33586491

Miranda MA, Carson C, St Pierre CL, Macias-Velasco JF, Hughes JW, Kunzmann M, Schmidt H, Wayhart JP, Lawson HA. Spontaneous restoration of functional β -cell mass in obese SM/J mice. *Physiological Reports*. 2020 Oct 28;8(2):e14573. PubMed PMID: 33113267

Carson C, Macias-Velasco JF, Gunawardana S, **Miranda MA**, Oyama S, St Pierre CL, Schmidt H, Wayhart JP, Lawson HA. Brown adipose expansion and remission of glycemic dysfunction in obese SM/J mice. *Cell Reports*. 2020 Oct 6;33(1):108237. PubMed PMID: 33027654

Miranda MA, St Pierre CL, Macias-Velasco JF, Nguyen HA, Carson C, Schmidt H, Agnello LT, Wayhart JP, Lawson HA. Dietary iron interacts with genetic background to influence glucose homeostasis. *Nutrition & Metabolism*. 2019 Feb 18;16:13. PubMed PMID: 30820238

Macias-Velasco JF, St Pierre CL, Wayhart JP, Yin L, Spears L, **Miranda MA**, Funai K, Cheverud JM, Semenkovich CF, Lawson HA. Epistatic networks associated with parent-of-origin effects on metabolic traits. *bioRxiv*. 2019 May 9: doi: <https://doi.org/10.1101/579748>

Miranda MA, Lawson HA. Ironing out the Details: Untangling Dietary Iron and Genetic Background in Diabetes. *Nutrients*. 2018 Oct 5;10(10):1437. PubMed PMID: 30301129

Walker CJ, O'Hern MJ, Serna VA, Kurita T, **Miranda MA**, Sapp CE, Mutch DG, Cohn DE, Goodfellow PJ. Novel SOX17 frameshift mutations in endometrial cancer are functionally distinct from recurrent missense mutations. *Oncotarget*. 2017 Aug 12;8(40):68758-68768. PubMed PMID: 28978154.

Walker CJ, **Miranda MA**, O'Hern MJ, Blachly JS, Moyer CL, Ivanovich J, Kroll KW, Eisfeld AK, Sapp CE, Mutch DG, Cohn DE, Bundschuh R, Goodfellow PJ. MonoSeq Variant Caller Reveals Novel Mononucleotide Run Indel Mutations in Tumors with Defective DNA Mismatch Repair. *Human Mutation*. 2016 Oct;37(10):1004-12. PubMed PMID: 27346418

Walker CJ, **Miranda MA**, O'Hern MJ, McElroy JP, Coombes KR, Bundschuh R, Cohn DE, Mutch DG, Goodfellow PJ. Patterns of CTCF and ZFX3 Mutation and Associated Outcomes in Endometrial Cancer. *Journal of the National Cancer Institute*. 2015 Sep 1;107(11). PubMed PMID: 26330387

WET LAB and COMPUTATIONAL SKILLS

Murine islet isolation and assessment, porcine islet isolation and assessment, islet calcium imaging, IHC and image analysis, mammalian cell culture (primary and continuous), mouse husbandry and metabolic phenotyping, qrtPCR, western blot, molecular cloning. In R: analysis and integration of bulk and single cell RNA sequencing, ATAC sequencing analysis, weighted gene co-expression network analysis (WGCNA), statistics and figure generation.

PRESENTATIONS

Miranda MA, Carson C, Macias-Velasco JF, Hughes J, Kunzmann M, Schmidt H, Wayhart JP, Lawson HA. Improved β -cell function underlies resolution of hyperglycemia in SM/J mice. Talk presented at Society for Advancement of Chicanos/Hispanics and Native Americans in Science Conference, 2020 October. Virtual. ** **Selected Speaker**

Miranda MA, Carson C, Macias-Velasco JF, Hughes J, Kunzmann M, Schmidt H, Wayhart JP, Lawson HA. Improved β -cell function underlies resolution of hyperglycemia in SM/J mice. Poster

presented at Keystone Symposia, Islet Biology: From Gene to Cell to Micro-Organ, 2020 January. Santa Fe, NM.

Miranda MA, Carson C, Macias-Velsco JF, Hughes J, Oyama S, Kunzmann M, Schmidt H, Wayhart JP, Lawson HA. Brown adipose- β -cell crosstalk in diabetic obesity. Talk presented at Stanford University PRISM program, 2019 October. Palo Alto, CA.

Miranda MA, Carson C, Schmidt HS, Macias-Velasco JF, Kunzmann M, Wayhart J, Lawson HA. Restoring Islet Function: Where do useful beta cells come from? Talk presented at Department of Genetics Friday Seminar Series. 2019 May. St. Louis, MO.

Miranda MA, Carson C, Kunzmann M, Wayhart, J, Lawson HA. Examining Beta Cell Function in a Model of Naturally Resolving Diabetes. Talk presented at Bouchet Graduate Honor Society Conference, 2019 April. New Haven, CT. **** Selected Speaker**

Miranda MA, Carson C, Kunzmann M, Wayhart, J, Lawson HA. Can Brown Adipose improve β -function? Talk presented at Washington University Chancellors Graduate Fellowship Program Symposium, 2018 September. St. Louis, MO. **** Selected Speaker**

Miranda MA, Carson C, Kunzmann M, Wayhart, J, Lawson HA. The Brown Adipose Tissue/ β -Cell Axis and the Resolution of Hyperglycemia. Talk presented at Washington University Developmental Biology Annual Retreat. 2018 May. Washington, MO.

Miranda MA, Macias-Velasco JF, Lawson HA. Dietary iron interacts with genetic background to influence adipose metabolism. Poster presented at Washington University Diabetes Research Center Diabetes Day Symposium, 2017 November. St. Louis, MO.

Miranda MA, Macias-Velasco JF, Lawson HA. Genetic Background Effects on Iron Homeostasis in Adipose-Mediated Metabolic Variation. Poster presented at American Diabetes Association annual meeting, 2017 June. San Diego, CA.

RESEARCH EXPERIENCE

Postdoctoral Fellow October 2021-Present
School of Medicine, Stanford University Stanford, CA

Lab of Seung Kim, Department of Developmental Biology

- Generated and characterized pseudoislets from mice and human donors to study β -cell function *in vitro* and *in vivo*.
- Performed RNA and ATAC sequencing on islets isolated from pigs at multiple developmental stages to characterize β -cell maturation.
- Analyzed single cell RNA sequencing data from human donors at multiple developmental time points.

Doctoral Student August 2015-August 2021
School of Medicine, Washington University in St. Louis St. Louis, MO
Lab of Heather Lawson, Department of Genetics

- Isolated islets from high fat fed mice for bulk and single cell RNA sequencing. Performed subsequent computational analysis.
- Characterized pancreatic islet response to dietary fat in mice by immunostaining and imaging pancreatic sections and isolating and culturing islets *ex vivo*.
- Examined influence of dietary iron on metabolic health by performing glucose and insulin tolerance tests, serum ELISAs, and tissue dissections on mice fed a high iron diet.
- Determined effect of dietary iron on gene expression in liver and adipose tissue by performing RNAseq, rtqPCR and Western blotting on tissue isolated from mice.

Research Associate

February 2013-May 2015

College of Medicine, Ohio State University

Columbus, OH

Goodfellow Lab, Department of Obstetrics & Gynecology

- Performed a large-scale PCR validation study identifying variants associated with endometrial cancer recurrence by designing primers and performing PCR and Sanger Sequencing.
- Developed computational method for identifying strand-slippage mutations in whole-exome sequencing data.
- Characterized functional consequences of common endometrial cancer mutations using molecular cloning, Western blotting, and luciferase reporting systems.

MENTORSHIP

Research Mentor to Undergraduate Student

Summer 2019

Washington University in St. Louis

St. Louis, MO

Opportunities in Genomics Research, McDonnell Research Institute

- Taught concepts in diabetes, adipose, and islet biology.
- Trained student in cell culture technique, RNA isolation, and gene expression analysis.
- Oversaw independent research project focused on brown adipose-pancreatic islet crosstalk.

Research Mentor to High School Student

Summer 2018

Washington University in St. Louis

St. Louis, MO

Summer Focus, Young Scientist Program

- Taught basic biological concepts, relating them to molecular biology techniques.
- Trained student to be proficient in PCR, rtPCR, histological staining and imaging.
- Guided student through project focused on iron metabolism in adipose health

Research Mentor to Undergraduate Researcher

August 2017-August 2018

Washington University in St. Louis

St. Louis, MO

Lawson Lab, Department of Genetics

- Taught advanced concepts in diabetes biology
- Trained student to proficiency in rtPCR and histological sectioning, staining, and imaging.
- Supervised computational analysis of islet size analysis.

Teaching Assistant

Fall 2016

Washington University in St. Louis

St. Louis, MO

Molecular Cell Biology Graduate Course

- Lead review section on cell biology concepts and research techniques to ~80 students.
- Taught and reviewed import concepts with students 1 on 1.
- Performed test writing and grading.

Lab Liaison

February 2013-May 2015

College of Medicine, Ohio State University

Columbus, OH

Goodfellow lab, Department of Obstetrics & Gynecology

- Taught non-scientific community members about the importance of cancer research and how our findings are translated into therapies.
- Demonstrated how to perform basic molecular biology techniques, including PCR and running agarose gels.
- Instructed group members on how to use a pipette and load an agarose gel, providing them with hands on experience at the lab bench.