Adelaide Tovar, Ph.D.

Postdoctoral Fellow
University of Michigan Medical School
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Education

The University of North Carolina at Chapel Hill Chapel Hill, NC
Ph.D. Genetics & Molecular Biology Aug. 2015-Feb. 2021
Advisor: Dr. Samir Kelada
Dissertation: "Dissecting respiratory responses to ozone exposure with genetics and genomics"

Massachusetts Institute of Technology Cambridge, MA
S.B. Course 7 - Biology Sept. 2011-June 2015
Advisors: Drs. Darrell Irvine and Gregory Szeto
Thesis: "Developing an improved immunotherapy for late-stage cancers by engineered immunomodulation"

Research Experience

University of Michigan, Dept. of Computational Medicine & Bioinformatics
Postdoctoral Fellow, Parker and Kitzman Labs Apr. 2021-present

- Leading the design and implementation of a cross-institution massively parallel reporter assay (MPRA) to screen metabolic disease-associated genetic variants
- Using computational approaches, including machine learning, to analyze existing MPRA data and identify sequence determinants of diabetes-relevant regulatory element activity

The University of North Carolina at Chapel Hill, Dept. of Genetics
Graduate Research Assistant, Kelada Lab Aug. 2015-Mar. 2021

- Designed and executed a large mouse screen (>500 animals) to carry out QTL mapping and other statistical genetics approaches to identify genes and pathways associated with susceptibility to adverse effects of ozone exposure
- Performed *in vitro* and *in vivo* studies to investigate inflammatory, epigenomic, and transcriptional responses to ozone exposure in airway macrophages
- Developed and refined existing bioinformatic/computational pipelines for microarray, Nano-string, RNA-seq, ATAC-seq, and quantitative genetics analyses

Massachusetts Institute of Technology, Dept. of Biological Engineering
Undergraduate Research Assistant, Irvine Lab Aug. 2013-June 2015

- Developed a novel biocompatible microparticle formulation for delivery of small molecules for use in individual and combinatorial cancer immunotherapy
- Examined the role of the aryl hydrocarbon receptor and the tryptophan catabolic pathway in innate and adaptive immune responses

University of North Texas, Dept. of Biological Sciences
Summer Researcher, Padilla Lab June 2013-Aug. 2013

- Designed and performed a forward genetics EMS mutagenesis screen in *C. elegans* to identify gene-by-diet interactions involved in responses to hypoxia and anoxia

Publications

*(*contributed equally)*

1. **A Tovar**, GJ Smith, JM Thomas, KM McFadden, SNP Kelada. A locus on chromosome 15 contribues to acute ozone-induced lung injury in Collaborative Cross mice. *Am J Respir Cell Mol Biol*. Epub ahead of print.
2. **A Tovar***, WL Crouse*, GJ Smith, JM Thomas, BP Keith, KM McFadden, TP Moran, TS Furey*, SNP Kelada*. Integrative phenotypic and genomic analyses reveal strain-dependent responses to acute ozone exposure and their associations with airway macrophage transcriptional activity. *Am J Physiol Lung Cell Mol Physiol*. 2022 Jan 1;322(1):L33-L49.
3. GJ Smith, **A Tovar**, KM McFadden, TP Moran, JG Wagner, JR Harkema, SNP Kelada. A Murine Model of Ozone-Induced Non-atopic Asthma from the Collaborative Cross. *Am J Respir Cell Mol Biol*. 2021 Dec;65(6):672-674.
4. GJ Smith, **A Tovar**, M Kanke, Y Wang, JS Deshane, P Sethupathy, SNP Kelada. Ozone-induced changes in the murine lung extracellular vesicle small RNA landscape. *Physiol Rep*. 2021 Sep;9(18):e15054.
5. LT Laudermilk, **A Tovar**, AK Homstad, JM Thomas, KM McFadden, MK Tune, DO Cowley, JR Mock, F Ideraabdullah, SNP Kelada. Baseline and innate immune response characterization of a Zfp30 knockout mouse strain. *Mamm Genome*. 2020 Aug;31(7-8):205-214.
6. **A Tovar***, GJ Smith*, JM Thomas, WL Crouse, J Harkema, SNP Kelada. Transcriptional profiling of the murine airway response to acute ozone exposure. *Toxicol Sci*. 2020 Jan 1;173(1):114-130. *contributed equally
7. M Weiser, JM Simon, B Kochar, **A Tovar**, JW Israel, A Robinson, GR Gipson, MS Schaner, HH Herfarth, RB Sartor, DPB McGovern, R Rahbar, TS Sadiq, MJ Koruda, TS Furey, SZ Sheikh. Molecular classification of Crohn's disease reveals two clinically relevant subtypes. *Gut*. 2018 Jan;67(1):36-42.

Funding

Postdoctoral Diversity Enrichment Program, Burroughs Wellcome Fund — Sept. 2022-Aug. 2025

REACH Loan Repayment Program, NIDDK — Aug. 2022-Jul. 2024
L70DK134031

Opportunity Pool Funding, Accelerating Medicines Partnership Program for Common Metabolic Diseases — May 2022-Apr. 2024
MPI with Jacob Kitzman and Steve Parker

Postdoctoral Training Program in Basic Diabetes Research, Department of Internal Medicine, University of Michigan Medical School — Sept. 2021-Aug. 2023
Administered by T32DK101357

Dissertation Completion Fellowship, The Graduate School, The University of North Carolina at Chapel Hill — Aug. 2020-May 2021

Graduate Student Travel Scholarship, International Mammalian Genome Society

- Washington, D.C. (funds returned, conference held virtually) — Apr. 2020
- Strasbourg, France — Sept. 2019
- Río Grande, Puerto Rico — Nov. 2018

Transportation Grant, UNC Graduate School Feb. 2019

Research Supplement to Promote Diversity in Health-Related Research,
National Institute of Environmental Health Sciences (NIEHS) Oct. 2016-Oct. 2019
Administered under parent grant R01ES024965

Selected Presentations

Oral

1. "A modular massively parallel reporter assay uncovers context-specific activity of diabetes-associated regulatory elements," American Diabetes Association 82nd Scientific Sessions, New Orleans, LA, June 2022
2. "A modular massively parallel reporter assay uncovers context-specific allelic activity of GWAS variants," American Society of Human Genetics Annual Meeting, virtual, Sept. 2021
3. "Gene-environment interactions underlie respiratory responses to the air pollutant ozone," Genetics Society of America Science in a Snapshot Seminar Series, virtual, June 2020
4. "A GxE QTL on Chr. 15 underlies susceptibility to air pollution-induced lung injury in mice," The Allied Genetics Conference, virtual, Apr. 2020
5. "Investigating susceptibility to ozone-induced lung inflammation and injury using the Collaborative Cross genetic reference population," American Thoracic Society International Conference, Dallas, TX, May 2019
6. "Understanding variation in responses to air pollution through genetics," UNC Kids Matter! Research to Action in Children's Environmental Health, Chapel Hill, NC, Oct. 2018

Poster

1. "A GxE QTL on Chr. 15 underlies susceptibility to air pollution-induced lung injury in mice," The Allied Genetics Conference, Virtual, Apr. 2020
2. "Identification of genetic loci associated with susceptibility to lung injury caused by the air pollutant ozone," International Mammalian Genome Conference, Strasbourg, France, Sept. 2019
3. "Dynamics of alveolar macrophage transcriptional regulation following sterile inflammation," Systems Immunology, Cold Spring Harbor Laboratory, Mar. 2019
4. "Exploring mouse strain-by-exposure interactions in pulmonary and systemic inflammatory responses to the air pollutant ozone," International Mammalian Genome Conference, Río Grande, Puerto Rico, Nov. 2018
5. "Characterization of the murine alveolar macrophage response to in vitro ozone exposure," Gene Expression & Signaling in the Immune System, Cold Spring Harbor Laboratory, Apr. 2018
6. "Characterization of the murine alveolar macrophage response to in vitro ozone exposure," National Society of Toxicology Meeting, San Antonio, TX, Mar. 2018

Awards and Honors

Outstanding Poster Presentation Award,
International Mammalian Genome Society Sept. 2019, Apr. 2020

Fellow, Yale Ciencia Academy for Career Development 2020

First Place, Poster Presentation Award,
Initiative for Maximizing Student Development Oct. 2019

Minority Trainee Development Scholarship, American Thoracic Society May 2019

S. Klein Prize in Technical Writing, MIT Comparative Media Studies/Writing May 2015
For undergraduate thesis

Award Winner, Wellcome Image Awards, Wellcome Trust Mar. 2015
Received with Gregory Szeto and Jeffrey Wyckoff

Winner, KI Image Awards, Koch Institute for Integrative Cancer Research Mar. 2015
Received with Gregory Szeto and Jeffrey Wyckoff

Mentorship

1. Kirsten Nishino, Parker lab undergraduate June 2022-current
2. Maya Bose, Parker lab graduate student Nov. 2021-Dec. 2021, Mar. 2022-current
3. Elysia Chou, Parker lab rotation student Jan. 2022-Mar. 2022
4. Morgan Nalesnik, Kelada lab rotation/graduate student Feb. 2020-Mar. 2021
   Currently: Graduate student in Kelada lab, UNC
5. Daniel Vargas, UNC undergraduate Aug. 2018-May 2020
   Currently: Laboratory manager in Kelada lab, UNC
6. Jessica Bustamante, UNC undergraduate Aug. 2018-May 2019
   Currently: Laboratory technologist, Scipher Medicine
7. Syed Masood, Kelada lab rotation student Aug.-Nov. 2018
   Currently: Graduate student in Samet lab, UNC
8. Abbott Ndukwe, UNC undergraduate Sept. 2017-May 2018
   Currently: UX Designer at Cisco

Teaching Experience

The University of North Carolina at Chapel Hill
Academic Coach Aug. 2017-May 2020

- GNET 621: Introduction to Genetic Analysis, GNET 632: Advanced Molecular Biology, BCB 720: Advanced Statistical Modeling

Teaching Assistant, GNET 632: Advanced Molecular Biology Jan.-May 2017

Massachusetts Institute of Technology
Tutor, Department of Biology Aug. 2014-May 2015

AP Biology Instructor, Educational Studies Program Aug. 2013-May 2014

Professional Memberships

- American Diabetes Association Apr. 2022-present
- American Society of Human Genetics Mar. 2021-present
- Genetics Society of America Jul. 2019-present
- International Mammalian Genome Society Jun. 2017-present
- Society for the Advancement of Chicanos and Native Americans in Science Aug. 2016-present

University and Professional Service

Abstract Reviewer, ASHG Jun. 2022

Co-chair, MPRA Working Group, AMP-CMD Consortium Jan. 2022-present

Application Reviewer, Intersections Science Fellows Symposium — Sept. 2021

Research Application Reviewer, SACNAS — Apr. 2021-Aug. 2021

Member, UNC Department of Genetics
URM Postdoc-to-Faculty Recruitment Committee — Sept. 2019-Dec. 2020

Panelist, UNC IMSD Bootcamp Discussions, Aug. 2020

Chair, UNC Academic and Research Intensive Careers (ARIC) Cohort — July 2019-Aug. 2020

Family Leader, UNC Department of Genetics Network (GeNe) — May 2019-May 2020

Advisor, UNC University Career Services
Pre-Graduate Eduducational Advising Program (PGEAP) — Aug. 2018-May 2020

Peer Mentor, UNC BBSP First-Year Group — Aug. 2018-May 2020

Poster Judge, UNC BBSP/PREP Research Symposium — Nov. 2019

Poster Judge, International Mammalian Genome Conference — Sept. 2019

Panelist, UNC IMSD Bootcamp Discussions, Aug. 2019

Member, PGEAP Recruitment & Training Committee — May 2019-Aug. 2019

Poster Judge, UNC Summer Undergraduate Pipeline Research Symposium — July 2019

Panelist, UNC Chancellor's Science Scholars STEM Grad School Discussion — July 2019

Member, UNC ARIC Cohort Planning Committee — Aug.-Dec. 2018

Outreach

Co-Chair, Education & DEI, Michigan DNA Day — Aug. 2021-July 2022

Educational Counselor, MIT Admissions — Aug. 2015-May 2020

Teacher, DNA Day CONNECT — Aug. 2017-May 2018

Ambassador, North Carolina DNA Day — Apr. 2016, Apr. 2017, Apr. 2018

Volunteer, Cambridge Science Festival — Apr. 2015