

J. Alejandra Rodriguez

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RESEARCHER

Ph.D. Candidate in Immunology with broad experience *in vivo* and *ex vivo* models, investigating the roles of T cells, NK cells, and macrophages in mucosal and reproductive immunity. My work focuses on reproductive immunology, exploring immune–endocrine crosstalk in the uterus and ovaries (with applications to conditions such as PCOS and endometriosis), as well as intestinal inflammation, with emphasis on immune–microbiota interactions. Skilled in a wide range of techniques, including flow cytometry, primary cell culture, tissue processing, and molecular biology approaches to dissect complex immune responses.

EDUCATION

Immunology and Infectious Disease Ph.D. Student

Dept of Biological Sciences, Purdue University, West Lafayette, Indiana, United States. **Aug 2022 - Exp. Dec 2026**

Master's in Biochemical Sciences (2 years).

Dept of Chemistry, National University of Colombia, Bogotá. **Aug 2019 - Aug 2021**

B.S Biology (5 years).

Dept of Biology, National University of Colombia, Bogotá. **Feb 2013 - Apr 2019**

SCHOLARSHIPS AND HONORS

- **Frederick N. Andrews Fellowship**, Purdue University, Aug 2022-Aug 2024.
- **Lindau Nobel Laureate Meeting Medicine and Physiology**, June 2023.
Selected among the 650 most qualified young researchers from around the world to participate in the 72nd Lindau Nobel Laureate Meeting (Medicine & Physiology) in Germany.
- **Baden-Württemberg Post Conference Fellow** – Fully funded by the Baden-Württemberg Stiftung. Selected to participate in the prestigious post-conference program of the 72nd Lindau Nobel Laureate Meeting (Medicine & Physiology), visiting top research institutions in Germany, July 2023.
- **PULSe Excellence in Research Award** recipient for the Purdue University Interdisciplinary Life Science program, June 2023.
- **Professional Grant Recipient**, Purdue Graduate Student Government (PGSG). May 2023.
- **Master's Scholarship** at the National University of Colombia, Aug 2019-Aug 2021.
- The highest admission score in the graduate admission exam of the Science Biochemistry Master program at the National University of Colombia, Jul 2019.
- Degree in Biology among the best 5% of the graduating students in the year 2019, Apr 2019.

RESEARCH EXPERIENCE

Immunology and Infectious Diseases, Olson Lab | Ph.D. research student

Apr 2023 - Present

Under the supervision of Prof. Dr. Matthew Olson

Dept of Biological Science, Purdue University, United States.

- Conducting a study on microbial interactions and immune host defense in an inflammatory disease study, with a particular focus on investigating the role of Granzymes and their interaction with the intestinal microbiota.
- Conducting a study on immune regulation and reproductive health, with a particular focus on investigating the role of Granzymes in uterine immune homeostasis and their impact on fertility and inflammation.

Bioinformatics and Systems Biology, Lab | Master research student

Aug 2019 - Dec 2021

Under the supervision of Prof. Dr. Andrés M. Pinzón V.

Institute of Genetics, National University of Colombia, Colombia.

- Conducted a study on the genetic variability and molecular interaction of the S proteins of SARS-COV2 and human ACE2. On focused on the study of SARS-CoV2 spike variants that emerged during the pandemic and evaluated their binding affinity with variants of ACE2.

Cancer Biology, Wendt, Lab | Visiting Undergraduate Scholar
Under the supervision of Prof. Dr. Michael K. Wendt.

Aug 2018 - Dec 2018

Dept of Medicinal Chemistry and Molecular Pharmacology, Purdue University, United States.

- Assisted in the study of determining the mechanisms of FGFR1 expression and post-translational modifications. On focused on the glycosylation of FGFR1 and how that affects the ability of breast cancer cells to respond to FGF ligands.

Laboratory of Molecular Phytopathology | Visiting Undergraduate Scholar
Under the supervision of Prof. Dr. Regine Kahmann and Dr. Mariana Schuster

Jan 2017 - Feb 2017

Max Planck Institute for Terrestrial Microbiology, Marburg, Germany.

- Assisted in the study to establish the CRISPR-Cas9 system in *U. maydis* and apprentice in laboratory techniques.

Cellular and Molecular Physiology, Lab | Research Student

Jan 2016 - Aug 2018

Under the supervision of Prof. Dr. Jean Paul Vernot.

Faculty of Medicine, National University of Colombia, Colombia.

- Conducted a study on the stromal molecular signals responsible for tumorigenesis in an aggressive breast cancer cell line (MDA-MB-231).
- Developing a new protocol for osteogenic, adipogenic, and chondrogenic differentiation in vitro in mesenchymal cells from bone marrow.

ECOMIC Microbial ecology, Lab | Research Student

Jan 2014 - Feb 2016

Under the supervision of Prof. Dr. Jimena Sanchez.

Faculty of Science, National University of Colombia, Colombia.

- Conducted a study on extremophile microorganisms of the xerophytic region of La Tatacoa (Villavieja, Huila-Colombia). Determined the nitrogen fixation activity and solubilization of phosphate.
- Selected and purified bacterial strains resistant to UV radiation from the desert soil of Tatacoa, to catalog them as microorganisms that promote plant growth.

TEACHING ASSISTANT EXPERIENCE

Purdue University, United States

- BIOL 221** – Introduction to Microbiology
Lab Teaching Assistant.

Aug 2027 - Present

Purdue University, United States

- BIOL 14504** – Year 1 Biology Lab: Diet, Inflammation, Immunity and Disease
Lab Teaching Assistant.

Jan 2025 - May 2025

Universidad Nacional de Colombia, Bogotá Campus, Colombia

- 2015570-1-Biochemistry**
Instructed Biochemistry to undergraduate students of Chemistry.

Aug 2020 - Jan 2021

- 1000025-Basic Chemistry Laboratory Techniques**

Aug 2019 - Aug 2021

Instructed Chemistry Laboratory Techniques to undergraduate students of Chemical Engineering.

- 2021146 - Biology of animal and human behavior**

Aug 2017 - May 2018

Instructed Biology to undergrad students

LEADERSHIP & COMMUNITY ENGAGEMENT

Purdue University – West Lafayette, IN

Organizing Committee Member – 2nd Colombian Academic Diaspora Symposium.

May 29-30, 2025

- Co-organized a two-day symposium that brought together over 120 attendees and more than 15 distinguished Colombian professionals, including senators, ambassadors, and former university presidents.
- Coordinated speaker outreach, event logistics, and attendee engagement for an international collaboration and professional growth symposium.

Board Member - Colombian Student Association at Purdue (CSAP).

Apr 2023 - Apr 2025

- Served as Vice President of the Board, leading the planning and execution of 30+ events, including professional workshops, academic panels, and cultural celebrations.

- Directed internal communication and team coordination to ensure successful events and sustained member engagement across two academic years.

Women in Science Purdue (WISP).

Aug 2022 - Present

- Active member of WISP, participating in networking, mentoring, and community-building events to support women in STEM.

PUBLICATIONS

First author

- **Rodriguez, J. A.**, Gonzalez, J., Arboleda-Bustos, C. E., Mendoza, N., Martinez, C., & Pinzon, A. *Computational modeling of the effect of five mutations on the structure of the ACE2 receptor and their correlation with infectivity and virulence of some emerged variants of SARS-CoV-2 suggests mechanisms of binding affinity dysregulation.* Chemico-biological interactions, (2022): 110244.
- Canaria, D. Alejandro, **J. Alejandra Rodriguez**, Luopin Wang, Franklin J. Yeo, Bingyu Yan, Mengbo Wang, Charlotte Campbell, Majid Kazemian, and Matthew R. Olson. *Tox induces T cell IL-10 production in a BATF-dependent manner.* Frontiers in Immunology 14 (2023): 1275423.
- Franklin J. Yeo, Mengbo Wang, Sungtae Park, **J. Alejandra Rodriguez**, Nicole L. Anderson, Pooja Khandelwahl, Majid Kazemian, and Matthew R. Olson. *Donor cell GATA3 is critical for gut T cell effector function and intestinal eosinophilia after hematopoietic cell transplantation.* Journal of Immunology (submitted, May 2025).

Book Chapters

- Leal, M.; Méndez, Y.; Sánchez, J.; Infante, A.; **Rodríguez, J.**; Bolivar, H.; Miranda, L.; Mejía, L.; Ballesteros, D.; Tamayo, P.; Cepeda, M.; Ruíz E.; *Microorganismos en ambientes extremos: El desierto como caso de estudio. En: Casos de Estudio y Aplicaciones en Ecología Microbiana.* Universidad Nacional de Colombia, 2017.
- Villalba, L.; Sánchez, J.; Patiño, M.; Campos, S.; Villalba, C.; Delgadillo, N.; Montaña, S.; **Rodríguez, J.**; Espitia, N.; Ruíz, E. Biodeterioro y perspectivas de investigación. En: Leal, M. (Ed). *Ecología Microbiana: Los Microorganismos y algunas de sus aplicaciones.* Universidad Nacional de Colombia. 2017.

PRESENTATIONS

- PULSe Interdisciplinary Life Sciences 20th Anniversary. Alejandra Rodriguez, Dr. Olson, “Granzyme-microbe interactions as a driver of immune-related adverse effects during cancer immunotherapy.” Purdue University, West Lafayette, IN. Poster presentation. September 2024.
- Cancer Research Day Symposium. Alejandra Rodriguez, Dr. Olson, “Granzyme-microbe interactions as a driver of immune-related adverse effects during cancer immunotherapy.” Purdue University Institute for Cancer Research, West Lafayette, IN. Poster presentation. April & October 2024.
- Purdue Institute for Drug Discovery 8th Annual Symposium. Alejandra Rodriguez, Dr. Olson. “Immune-derived Granzyme A directly interacts with commensal and pathogenic microbes.” Purdue University, West Lafayette, IN. Poster presentation. October 2023.
- BSGSA Research Symposium. Alejandra Rodriguez, Dr. Olson, “Granzyme A Binding Alters Gut Microbial Function.” Purdue University, West Lafayette, IN. Poster presentation. August 2023.
- Reyes, R.; Mejia, L.; Ballesteros, D.; Gonzales, L.; Miranda, L.; Bolivar, H.; Tamayo, P.; **Rodriguez, J.**; Torres, J.; Suarez, J.; Mendez, Y.; Leal, M.; Tovar, D.; Saavedra, F.; Ruiz, E.; and Sanchez, J.; *Extremophile microorganism of the xerophytic region of La Tatacoa (Villavieja, Huila-Colombia), with nitrogen fixation activity and solubilization of phosphate; and its possible applications astrobiology.* IAU Symposium 328: Living around active stars” held in Maresias, SP, Brazil, October 2016.

LANGUAGES

- Spanish: Native. English: Advanced.