



THE UNIVERSITY OF ARIZONA

Mel & Enid Zuckerman College of Public Health

Organization Name:

Mel and Enid Zuckerman College of Public Health, Department of Community Environment & Policy, Binational Early Asthma and Microbiome Study (BEAMS)

Organization Background:

Overall prevalence of childhood asthma has significantly increased in the last decades, and one potential explanation for this upsurge is decreased exposure to protective environmental microbes due to improvements in sanitation and use/overuse of antimicrobial products during pregnancy and early life. In support of this contention, several studies in isolated rural communities have reported lower prevalence of asthma among children of animal farmers more heavily exposed to environmental microbes than among their non-farmer peers. The Binational Early Asthma and Microbiome (BEAMS) research program is a NIH funded program project grant. This study builds on our observation that children of Mexican descent living in Tucson are at a higher risk of developing childhood asthma than children who live in Nogales Mexico. We believe that early life exposures, including prenatal exposures, are influencing this risk. BEAMS is enrolling pregnant women of Mexican descent in Tucson and pregnant women in Nogales, Mexico. We are collecting human and environmental samples through home visits prenatally and after the baby is born for the first two to three years of life. The human samples include blood for immunologic studies and sampling for microbiome including stool and vaginal swabs. The environmental studies include house dust samples and drinking water. Ultimately, we will evaluate microbial exposures of the baby from the home and the mother and try to determine if and how those exposures are influencing the baby's immune system development and asthma risk. We expect BEAMS to offer a better understanding of the early origins of asthma and new asthma prevention strategies applicable to Mexican Americans, and potentially to all Americans.

Internship Project Title

Binational Early Asthma and Microbiome Study (BEAMS)

Project Description:

The Binational Early Asthma and Microbiome Study (BEAMS) is a cross-border investigation of children's susceptibility to asthma in the United States and Mexico. The study, which is funded by the National Institutes of Allergy and Infectious Diseases, will recruit 250 Mexican American mothers in Tucson and another 250 Mexican mothers in Nogales, Sonora, Mexico for a total of five hundred expectant mothers. The study will follow the mothers up until they give

birth and continue following their children until age 5. Our team of clinical coordinators collect samples of blood and stool from the pregnant women before they give birth. At the time of birth, a blood sample is collected from the infant's umbilical cord along with a meconium sample. Over the years as the children are followed additional samples of blood, stool and throat cultures are collected. Environmental samples of dust from the home and drinking water from the source are collected as well. Through these samples BEAMS hopes to determine how microbes dictate – or don't – the development of allergies and asthma, as well as what genetic influences may result in better preventive therapies. Researchers from the University of Arizona include those located at the Asthma & Airway disease research center (A2DRC), the BIO5 institute, the Bioscience Research Laboratories (BSRL), and the Mel and Enid Zuckerman College of Public Health (MEZCOPH). Collaborating institutions include the University of California San Francisco (UCSF), El Rio Community Health Center, the Mexican institute of Social Security ("IMSS"), and El Colegio de Frontera Norte (COLEF). Interns who apply will be trained to record data and process water and dust samples. Students will be expected to assist in the project for 10-20 hours per week, with flexibility provided for school courses.

Internship project keywords (check all that apply).

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| ☒ Health Disparities | ☒ Maternal/Infant Health |
| ☐ Public Health Preparedness | ☐ Tobacco Use |
| ☒ Collaborations with Community | ☐ Injury/Violence Prevention |
| ☒ Collaborations with University | ☐ Immunization |
| ☐ Community health service | ☐ Infectious Disease |
| ☐ Physical Activity | ☐ Oral Health |
| ☐ Substance Abuse | ☐ Evaluation |
| ☐ Mental Health | ☐ Policy Development |
| ☐ Access to care | ☐ Program Planning |
| ☐ Nutrition | ☐ Data Analysis |
| ☐ Reproductive/Sexual Health | ☐ Other: |
| ☒ Environmental Health | |

When: When do you want the work done? Check all that apply.

- ☒Summer 2024
- ☒Fall 2024
- ☒Spring 2025
- ☒Summer 2025
- ☒Fall 2025

☐I want this listing to remain active indefinitely and we will accept applications from students for any upcoming semester.

☐This listing is only for a specific semester/term: _____

Where:

Organization Mailing Address: : *Medical Research Building located at 1656 E. Mabel St., Tucson, AZ 85719 near the Highland Parking Garage*

Address where Student will work (if different from above): *N/A*

☐ Check here if the student may have the option to work remotely from a site not listed above for all or part of this project.

Student Characteristics:

Candidates should be meticulous, able to solve practical problems, have an interest in hands-on experience, basic knowledge of excel, and data entry skills. Those with previous experience working in a lab or with environmental or biological samples are encouraged to apply.

Level of Expertise Needed: *Do you wish to request an MPH program intern or an undergraduate public health program intern?*

Undergraduate: The internship for undergraduates should provide an experience that allows students to incorporate classroom learning into public health practice.

Graduate: Applied experiences for graduate students should require application of advanced knowledge and skills to the solution of health problems and the production of at least two agency-based deliverables.

Both experiences prepare students for future employment.

☐ MPH

☒ Undergraduate

Supervision

Emma Gallardo will provide primary supervision to the intern. She is a MEZCOPH graduate herself and currently serves as research project manager in Dr. Beamer's laboratory. Her work with the University began while she was an intern herself in 2022. In her time working at the University, she has gained valuable knowledge volunteering and working both in the field and in the lab.

Compensation/Benefits/Professional Development

This is an unpaid internship; however, the experience will provide students with an opportunity to gain knowledge working in a lab setting and learn proper sample handling and processing techniques.

Application Contact Information

Interested applicants should email Emma Gallardo (emmavgallardo@arizona.edu) with a CV or resume and a one paragraph explanation of why they are interested in the internship. Applicants should put "BEAMS Environmental Samples Processing Internship" in the email subject.