

The University of Arizona
Mel and Enid Zuckerman College of Public Health



Organization Name:

MOSAIC Systems Health and Pain Science Lab, University of Arizona

Organization Background:

MOSAIC Systems Health and Pain Science Lab is a translational research lab focused on systems science for real-world recovery from pain and injury. It integrates population epidemiology, mechanistic biology, and patient-centered rehabilitation research to identify actionable drivers of pain, function, and whole-person health. Within the University of Arizona, the lab collaborates with the Mel and Enid Zuckerman College of Public Health, the Doctor of Physical Therapy program, and multiple other programs (pharmacology, physiology, bioengineering) to generate publishable evidence that can guide scalable prevention and care pathways. Currently, the lab is funded for a clinical translational project on the use of NAC as an adjuvant to manage pain and inflammation. This is a parallel animal-clinical model design focused on potential clinical implementation. Other upcoming projects use large publicly available health datasets, such as NHANES, to estimate normative biomarker values and evaluate environmental exposure-related risk factors relevant to chronic pain.

MPH Internship: -- open to both MPH and UG students

Two upcoming projects are open for internship opportunities.

1. Normative values on bloodwork-related indices of inflammation and immune dysfunction.
2. Associations between environmental exposures (e.g., pesticides or heavy metals) and chronic pain.

Project Description:

This internship offers MPH students the opportunity to support or co-lead one of two epidemiologic analyses aligned with the lab's precision rehabilitation and systems health vision.

Project track A: Normative values for bloodwork-based indices of inflammation and immune dysfunction. Using nationally representative public datasets (e.g., NHANES), the intern will develop reference distributions and subgroup-specific norms for commonly used immune and inflammatory indices derived from routine laboratory tests (e.g., CRP, WBC differentials, neutrophil-lymphocyte ratio, platelet-lymphocyte ratio, albumin, and related composite indices).

Project track B: Environmental exposures and chronic pain. Using public datasets that include biomonitoring measures of metals and other environmental chemicals (for example, blood lead, cadmium, mercury, and urine metals), the intern will evaluate associations between exposure levels and chronic pain outcomes, including effect modification by sociodemographic factors and comorbidities.

Scope of activities (expected):

- Background literature review and identification of key covariates and potential confounders
- Dataset selection and variable mapping across survey cycles
- Data import, cleaning, harmonization, and creation of an analysis-ready dataset
- Pre-registration style statistical analysis plan (models, survey weights, sensitivity analyses)
- Primary analyses and reproducible code (SAS, JMP, R, or Python) with clear documentation
- Preparation of at least two agency-based deliverables: a cleaned dataset plus codebook, and a results deliverable suitable for manuscript drafting (tables, figures, and a draft methods and results section)

Specialized skills helpful (not required):

familiarity with survey-weighted analysis, regression modeling, reproducible workflows (Git), and basic causal inference concepts.

Work schedule expectations:

Typically, 8 to 12 hours per week for one academic term, flexible scheduling. Remote work is feasible for most tasks, except for the biweekly, in-person lab meeting; optional in-person meetings can be arranged on campus.

Internship project keywords (check all that apply).

- | | |
|---|---|
| ☐ Health Disparities | ☐ Maternal/Infant Health |
| ☐ Public Health Preparedness | ☐ Tobacco Use |
| ☐ Collaborations with Community | ☐ Injury/Violence Prevention |
| ☐ Collaborations with the 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 Click or tap here to enter text. |
| ☒ Environmental Health | |

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

- ☐ Fall Semester
- ☐ Spring Semester
- ☐ Summer Term

☒ 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: University of Arizona, Health Science Innovation Building HSIB – 9th floor, Tucson, AZ (exact address upon request)

☒ *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:

Strong fit for MPH students interested in epidemiology, environmental health, biostatistics, chronic disease, pain science, and translational research. Ideal applicants are curious, detail-oriented, comfortable working with large datasets, and motivated to produce publication-quality work.

Level of Expertise Needed:

Graduate (MPH) preferred; exceptional undergraduate applicants with strong quantitative skills will be considered.

Both experiences prepare students for future employment.

☐ MPH

☒ Undergraduate

☒ Either

Supervisor:

Valerio Tonelli Enrico, PT, PhD, MSCE (Assistant Professor, University of Arizona). Dr. Tonelli Enrico leads the MOSAIC lab and has training and experience in epidemiology, pain science, and rehabilitation research, including design and analysis of observational and interventional studies using biomarkers, clinical outcomes, and large datasets.

Compensation/Benefits/Professional Development:

Compensation:

To be determined based on funding availability; currently, most internships are unpaid.

Professional development:

The intern will be invited to join lab meetings, receive structured mentoring in analytical planning and reproducible research, and may have the opportunity to present findings internally.

Authorship: Substantial contributions to analysis and writing will be recognized with co-authorship on abstracts and manuscripts consistent with standard authorship guidelines.

Application Contact Information:

To apply, please email: vte@arizona.edu

Include:

- (1) CV or resume,
- (2) brief statement of interest (1 page) indicating preferred project track (A, B, or both) and relevant coursework/skills,
- (3) unofficial transcript.